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Applied Research Programme

Energy, fragility and conflict

Briefing note

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1 Introduction

This short note provides a summary overview of the relationship between energy, fragility and conflict and explores four research areas withn the topic area. This first section starts by defining the key terms and framing the overall discussion. The second section outlines specific elements of the relationship relevant to the research areas identified for the Energy and Economic Growth (EEG) Research Programme and suggests tentative research questions for further analysis.

The discussion is based on a short, light-touch literature review of open-access, online sources. This review found a small and generally low quality theoretical or empirical research explicitly exploring the relationship between fragility, conflict and energy, which mirrors the finding of one other review on a similar topic (USAID 2010). The briefing note is therefore based mostly on inferences made from related policy and academic literatures (for example, economic growth, investment decisions, and governance), relevant news media, and the author's own reflections on how these might apply to the energy sector.

1.1 What do we mean by fragility and conflict?

Although the terms 'fragility' and 'conflict' are frequently used in the aid policy community, there is no agreement on the definition of these terms or the 'fragile and conflict-affected situations' to which these terms are often applied.

In this briefing note, we consider 'fragility' as the long-term propensity of a conflict to lead to violence. This roughly mirrors the definition provided in the World Development Report 2011, which describes fragility as "periods when states or institutions lack the capacity, accountability to mediate relations between citizen groups and between citizens and the state, making them vulnerable to violence" (World Bank 2011).[1] The opposite of 'fragility' is 'resilience', such that resilient societies are those that are able to manage conflicts without leading to violence in the long-term.

Finding appropriate indicators to measure 'fragility' is fraught with conceptual and analytical challenges.[2] This has led to striking differences between how different donors such as the Department for International Development (DFID), World Bank and Organisation for Economic Cooperative and Development (OECD) identify 'fragile' states. The use of different measurements highlights that fragility is a spectrum insofar as all conflict situations have the potential to lead to violence to a lesser or greater extent. Although a useful but imperfect tool for policymakers[3], classifications of 'fragile and conflict-affected states' (FCAS) risk signalling an unrealistic degree of precision and misleadingly assigning fragility as a characteristic of the state, whereas it often applies to greater or lesser extents at sub-national and community levels. This paper therefore refers to 'fragile and conflict-affected *situations*' rather than '*states*'. Finally, although fragile and conflict-affected situations share a 'symptom' (i.e. vulnerability to violence), the causal dynamics driving this symptom and the intensity of the symptom are extremely diverse. There is therefore a huge amount of variety within commonly-cited lists of 'fragile and conflict-affected situations',

[1] Note that this definition differs from that given by the OECD, which characterises fragility as "the combination of exposure to risk and insuficicent coping capacity of the state, system and/or communities to manage, absorb or mitigate those risks" (OECD 2016, p.21). This is a broader definition that includes risks arising from humanitarian shocks and climate change, though begs the question of what 'coping' consists in.

[2] These challenges include: distinguishing the symptoms from the causes of fragility; establishing how to identify fragility in the absence of violence (including recourse to contested analysis of conflict drivers); understanding what types of violence are 'symptoms' of fragility (e.g. violent crime); the 'politicisation' or 'stigmatisation' associated with the label of fragility; and agreeing indicators that capture context-specific dynamics that can nonetheless be applied across the whole set of countries. For additional reading, see Woolcock (2014) and Grimm, Lemay-Hébert and Nay (2014).

[3] For example, classifications have been used to determine eligibility for volume and type of aid funding.

grouping together diverse countries such as Afghanistan, Nigeria, Rwanda, Somalia and Sudan. This paper has not sought to reduce this variety but rather focused on countries that are consistently classified as fragile across major donors' existing classifications.

1.2 Why is fragility and conflict relevant to energy sector?

Fragility and conflict are highly relevant concepts to research on the energy sector. The increasing concentration of extreme poverty and underdevelopment in FCAS has led several donors, including DFID and the World Bank, to increase the proportion of resources allocated to these contexts (HMG 2015; World Bank 2013). Most fragile and conflict-affected situations have significantly worse development outcomes relating to energy. For example, on average 43% of the populations in the 21 priority countries[4] DFID considers as fragile and conflict-affected situations had access to electricity in 2014 (falling as low as 4% in South Sudan), whereas on average 58% of the populations in DFID's 7 non-FCAS priority countries[5] had access to electricity (World Bank 2017). Likewise, Doing Business research reveals that whereas it takes on average 93 days to obtain a permanent electricity connection in DFID's 7 non-FCAS priority countries, this increases by over 47% to 137 days for DFID's FCAS countries. Although these patterns are only associative, they also hint at the existence of a causal relationship between fragility and outcomes in the energy sector. The bi-directional nature of this relationship is considered briefly in the following two sections before a more focused discussion of fragility with reference to EEG's specific research areas.

1.2.1 The impact of fragility and conflict on the energy sector

The large-scale, efficient and effective delivery of energy is highly dependent on strong sector governance that is absent in fragile and conflict-affected situations.

Investors in the energy sector are generally required to commit large financial and human resources up-front before a positive net return-on-investment can be made. This is a particular challenge for fragile and conflict-affected situations given their weaker domestic revenue mobilisation capacity (Di John 2010), which makes them more dependent on private domestic or foreign direct investment. However, in fragile states both private investors and political actors tend to have shorter time horizons due to uncertainty over the future. In more resilient states, such uncertainty is often overcome through governance actors' pre-commitment to honour property rights by submitting to 'rules of the game' (or 'institutions') that bind their future decisions (and therefore availability to manipulate tariffs, appropriate property, or take other actions that would adversely affect investors' returns). However the increased likelihood of violent contestation of power in fragile and conflict-affected situations means that politicians in such situations tend to lack the credibility to pre-commit. The challenge for fragile and conflict-affected situations is therefore to build the credibility to pre-commit to the 'rules of the game' in the absence of a monopoly on the legitimate use of violence – a challenge that has been referred to as "the problem of violence" (North et al. 2007). The political economies and deep-rooted corruption often facilitated by years of conflict also undermine effective public governance of the energy sector in ways that extend beyond creating an attractive business climate. Conversely, many of the alleged 'success' stories in Africa, such as GFhana, South Africa and Morocco, have been attributed to good (or at least better) sector governance (IRENA 2012, p.11).

[4] The 21 DFID FCAS priority countries are: Afghanistan, Bangladesh, Myanmar (Burma), Democratic Republic of Congo, Ethiopia, Kenya, Liberia, Malawi, Nepal, Nigeria, Occupied Palestinian Territories, Pakistan, Rwanda, Sierra Leone, Somalia, South Sudan, Sudan, Tajiistan, Uganda, Yemen and Zimbabwe. This list was taken from ICAI (2015). The average provided in this report excludes the Occupied Palestinian Territories given lack of data availability.

[5] The 7 DFID non-FCAS prio rity countries are: Ghana, India, Kyrgzstan, Mozambique, South Africa, Tanzania, Zambia. This list was taken from NAO (2016).

Fragility and violence tend to depress household and business incomes.[6] This makes it even more difficult to mobilise the capital needed for the energy sector, since energy consumers are even more likely to lack sufficient financial resources to pay energy prices required for private or public investors to recoup costs. Consumers' also need to be confident that energy prices are sufficiently predictable in order to make informed decisions about whether to purchase energy. However, in the absence of market competition and effective state regulation, energy suppliers in fragile and conflict-affected situations have been accused of charging customers arbitrary amounts that disincentivises their purchase of electricity (Al Jazeera 2016). These twin factors of consumers' inability and unwillingness to pay for energy in the face of poverty and uncertainty makes it even more difficult for potential energy suppliers to recoup their investments in fragile and conflict-affected situations.

Finally, critical infrastructure necessary to supply energy is particularly vulnerable to destruction as a result of high-intensity violent conflict. The geographical breadth of electricity grids and power stations' dependence on pipelines or transport infrastructure to deliver fuel make them difficult to defend in high-intensity conflicts.

Although perhaps an outlier in terms of its high intensity, by 2013, more than 30 of Syria's power stations were inactive and at least 40% of the country's high voltage lines had been attacked, with total value of damage to the energy sector estimated at $648-791 million (Gobat and Kostial 2016). Likewise, with the important exceptions of some cities in Somaliland and Puntland, public energy infrastructure has been completely incapacitated such that the entire energy supply system is now owned and operated by the private sector (AfDB 2015, p.7). Indeed, a private sector-led approach focused on smaller-scale generation may in fact be more effective than alternatives in the face of violence.

1.2.2 The impact of the energy sector on fragility and conflict

The energy needs of fragile and conflict-affected situations are often much greater than non-fragile situations and constitute a constraint on a societies' ability to generate the economic growth and political stability required to escape a situation of fragility (World Bank 2011, p.19). As the World Bank Energy Sector Directions Paper notes, "Providing electricity may be especially important in fragile and conflict-affected states, where resumption of electricity supply can be important in restoring confidence in the government, strengthening security and reviving the economy (World Bank 2013). The energy sector thus constitutes a central economic dimension of the so-called 'conflict trap': a sub-optimal equilibrium whereby poor performance in the energy sector therefore not only results from violence, but may also be one factor that creates the structural conditions for a continuation of violence.

Interventions seeking to increase the performance of the energy sector have the opportunity to unlock a fragile society's economic potential in a number of ways (McIntosh and Buckley 2014). Lower energy costs can stimulate investment and the growth of enterprise and related job-creation by the private sector. Energy infrastructure projects can lead to direct job-creation (though in fragile and conflict-affected situations low human capital is often a barrier to ensuring 'local content' in value chains). As well as these impacts on individual livelihoods, the resulting economic growth can increase the value of the tax base and scope for government to diverse its domestic revenue mobilisation, thereby increasing its resilience to shocks. At the macroeconomic level, countries with electrification rates of less than 80 percent of the population suffer from reduced GDP per capita (McKinsey 2015).

[6] Although this impact is often felt asymmetrically, with some regions or groups sometimes benefiting from conflict as part of 'war economies'.

Nonetheless, the relationship between economic growth and conflict should not be taken for granted. The impact of economic growth resulting from increased access to energy will depend on a number of context-specific factors, including which sectors are able to grow as a result of improved access to energy and who is best positioned to capture these sector-specific benefits in the context of fragility (or even a war economy). Indeed – and perhaps more worrying – there is strong evidence that development in the energy sector can in some cases fuel conflict and increase the risk of violence. Some of these dynamics are explored in more depth with reference to specific cases below.

1.2.3 Implications

The preceding discussion highlights that 'business as usual' approaches to the energy sector are not appropriate in fragile and conflict-affected situations. First, the impact of fragility and conflict on the energy sector mean that both the needs and opportunities are often different to more resilient situations. Second, the energy sector has the potential to be part of the solution *and* problem in fragile and conflict-affected situations. Decision-makers must therefore foster a critical awareness of conflict dynamics and how these relate to the energy sector in such situations to ensure that improvements in the energy sector are harnessed to improve prospects for peace and resilience rather than exacerbate existing conflict dynamics. Box 1 presents just a small selection of the questions that might reasonably be asked to develop such an awareness. In practice, the trade-offs between goals on the energy sector agenda (often longer term) and conflict agenda (often shorter term) mean that 'best fit' strategies may need to be adopted instead of 'best practice'. Indeed, the emphasis on context-specificity of policy problems and solutions should caution against grouping together 'fragile and conflict-affected states' as a single category to be addressed in a research agenda. As one notable review summarises, "the energy security-conflict linkage is very largely a function of the specific political, economic, social, cultural and historical context of a country" (USAID 2010, p.4). Although a common framework or methods for analysis may be possible, the external validity of research findings on any given fragile or conflict-affected situation is limited given heterogeneous contexts and conflict dynamics.

Box 1: Conflict analysis and the energy sector

The causal relationship between fragility, conflict and energy is complex and will vary significantly depending on the context. The assumptions that underpin these relationships should be identified and critically examined as part of project design and implementation. A small, non-exhaustive selection of relevant questions that challenge such commonly-held assumptions are as follows:

- Would economic opportunities resulting from energy construction projects or increased energy access be delivered to marginalised groups that might otherwise be recruited into armed groups?
- To what extent are armed groups (or government) capable and interested in disruption (or protection) of electricity generation and grids?
- How might reform of the energy sector disrupt rent distribution networks that serve to bind together coalitions necessary to sustain order?
- How can high-value procurement processes in the energy sector be effectively managed to avoid them becoming the source of competition between conflict actors or fuelling perceptions of corruption and resulting grievances?
- How might access to energy become the source of competition or control over energy access a tool to entrench patterns of marginalisation (e.g. geographical inequity, socioeconomic inequality) that are themselves conflict drivers?

Effectively harnessing the potential of the energy sector to contribute to peace and mitigating the risk of 'doing harm' requires a strong understanding of the conflict-sensitivity of energy sector practices and interventions in any given context. Targeted conflict analysis and participatory project design and implementation processes represent two mechanisms that can contribute towards this understanding.

2 Viewing EEG through a conflict lens

The fact that there is hardly any high quality research attempting to apply a conflict-sensitive lens[7] to the energy sector is both surprising and concerning. This constitutes a gap in the body of literature to which EEG could usefully contribute as it moves into phase two. This section provides a brief overview over policy challenges particularly relevant to fragile and conflict-affected situations in each EEG research area that could be the subject of additional research.

2.1 Research area 1: Energy reliability

As noted by the EEG Framing Paper, developing countries remain plagued by chronic load shedding and blackouts that constrain economic productivity and leave families in the dark (OPM 2017). Evidence suggests that such blackouts – or the reliance on poor quality lighting from firewood – increases vulnerability to sexual violence against women and girls (E4SV 2015). Low levels of energy consumption associated with fuel poverty have also been linked to higher robbery rates in the US (Helms and Costanza 2014) and anecdotal evidence recalled by a senior South Asian police official also suggests a causal link between blackouts and increased urban violence.

However, it is unclear how the nature of this unreliability may differ given the higher dependence of households and businesses in fragile and conflict-affected situations on small- and medium-sized generators. On the one hand, smaller generators tend to be located closer to energy consumers and this may reduce information asymmetries between energy suppliers and producers and facilitate greater influence of suppliers over consumption patterns. On the other hand, access to affordable fuel may be a larger driver of fluctuations in energy supply, especially in areas affected by higher levels of violence. One example of this is the impact of armed violence in Nepal's southern Terai plains in late 2015, which is discussed in more detail in Box 2.

Box 2: Nepal's ethnic conflict and fuel insecurity

Although Nepal's ten year civil war formally ended with the signature of a Comprehensive Peace Accord (CPA) between the Government of Nepal and Unified Communist Party of Nepal in 2006, the country continues to grapple with the underlying patterns of socio-economic and political marginalisation that fuelled armed violence.

In September 2015, the approval of Nepal's new constitution sparked protests by Madhesi and Tharu groups in the southern Terai plains along the border with India, who complained that the constitution-making process had been rushed following the devastating earthquake in the same year and overlooked grievances that the CPA had promised to address (ICG 2016). This resulted in a blockade of vital supplies, including fuel, by Madhesi protestors that lasted for 135 days. Nepal is highly dependent on neighbouring India for its fuel, which the Nepalese authorities accused of deliberately obstructing the flow of fuel tankers across the border in an attempt to influence the constitution-making process. The fuel shortage has led to daily power cuts of between 8-12 hours, widespread school closures, and illegal deforestation as the demand for firewood has surged (BBC 2015). The Government of Nepal reported a "major humanitarian crisis" and that the economic impact of the blockade would be greater than the earthquake that took place earlier in the year (India Times 2015).

These events have exposed the vulnerability of Nepal's energy supply to disruption as a result of continued protest and fragility. They highlight the need for fragile societies to diversify their energy sources to reduce dependence. However, such diversification often requires requires confronting a domestic political economy and international interests that derive benefits from the status quo. For example, a strategic pivot towards more domestic generation may further undermine the bargaining power of Madhesi and Tharu groups currently able to block and thereby risks increasing the very marginalisation that drives the conflict. This suggests the existence of trade-offs over time and across different sectors.

[7] Application of a 'conflict-sensitive lens' involves explicit consideration of the relationship between conflict dynamics and violence with the subject, including an understanding of how conflict dynamics influence risks and opportunities for impact in the energy sector, as well as how the energy influences conflict dynamics.

Furthermore, from an investment and planning perspective, forecasting future energy profits is complicated by the increased uncertainty relating to construction costs, operating costs, regulatory environment, and energy demand given the non-linear transitions from violence inherent in fragile and conflict-affected situations. In reality this uncertainty has meant that energy demand outstrips supply in fragile and conflict-affected situations. Recent research has highlighted the lack of appropriate planning methodologies in the context of this uncertainty and the need for a more intelligent approach to risk-taking in conflict-prone countries (Bazilian and Chattopadhyay 2015). Indeed, one review notes the importance for large investments in the energy sector to avoid "creating future dependencies that could make fragile states very vulnerable to high energy prices" (Jones and Howarth 2012, p.18).

Another major issue is the prevalence and impact of negative coping strategies in the absence of reliable energy in fragile and conflict-affected situations. In several cases, reduced access to electricity, sharp reductions in incomes, and the dysfunction of natural resource management during conflict have pushed households to adopt coping strategies that increase consumption of wood and charcoal, with major ramifications on conflict dynamics. In Somalia, the collapse in incomes resulting from the civil war has led an estimated 80-90% of the population relying on cheap biomass (firewood and charcoal) as their primary source of energy (AfDB 2015). In addition to domestic demand, the weakening of state law enforcement capability has allowed the emergence of a large illegal charcoal export economy that provides al-Shabab with estimated revenues of more than $50 million a year (Al Jazeera 2015). The resulting widespread deforestation has increased the vulnerability of the region to crop failure, drought and food shortages that in turn deepen poverty and fuel grievances that provide fertile ground for recruitment into armed groups. In Chad, the government's attempts to curb desertification by enforcing a total ban on charcoal and wood products being imported to the capital N'Djamena led to widespread shortages and energy price increases, violent protests and a government crackdown that risked destabilising the capital (USAID 2010). Likewise, the charcoal trade around the city of Goma in eastern Democratic Republic of Congo (DRC) has led to unsustainable deforestation in the Virunga National park and provided a major source of funding for the Democratic Forces for the Liberation of Rwanda (FDLR) (USAID 2010; Dranginis 2016). Attempts to diversify the energy mix in these fragile and conflict-affected situations will therefore inevitably confront the entrenched political economy of conflict and should be pursued in a conflict-sensitive manner.

Key takeaways for EEG

- What are the factors driving energy unreliability in fragility and conflict-affected contexts and how can these factors be more effectively reduced?
- What are the barriers relating to conflict and fragility to regional energy cooperation, what are the potential economic losses associated with these barriers, and how might these barriers be overcome more effectively?
- How can risks involved in planning in the energy sector in fragile and conflict-affected situations be more effectively assessed and mitigated to improve future energy reliability?
- How do strategies to increase energy reliability and diversification interact with conflict dynamics, and how can these strategies be made to be more conflict-sensitive?

2.2 Research area 2: Efficient and productive use of electricity

The relatively greater scarcity of electricity in fragile and conflict-affected situations makes it all the more important that electricity is used efficiently. The reliance on small diesel generators can mean that generation costs can easily run to $400 per megawatt hour (IRENA 2012) and as much as $600 per megawatt hour in Somalia (Doing Business 2016). However, promoting energy efficiency may be more difficult in fragile and conflict-affected situations. Engaging consumers through behavioural change campaigns or encouraging widespread adoption of new more efficient technologies may be harder to achieve in these contexts, where levels of social cohesion may be weakened and potential to disseminate new technologies disrupted by violence.

On the other hand, more efficient and productive use of electricity has the potential to address economic drivers of fragility by creating more jobs (thereby tackling a major economic driver of recruitment into armed groups) and expanding the tax base. However, as emphasised in Box 1 above, the causal relationship between economic growth and fragility is complex and not necessarily positive. Decision makers seeking to harness the energy sector to contribute towards conflict prevention should integrate conflict analysis into their energy sector planning to ensure productivity gains accrue to sectors where conflict drivers can be most effectively addressed.

Key takeaways for EEG

- What tools (e.g. frameworks, decisionmaking trees) would support decision makers in assessing the potential impact of different energy sector interventions on fragility and conflict dynamics?
- In particular, what are the relevant factors to consider when deciding whether to use electricity for productive or residential purposes to address drivers of fragility and conflict?

2.3 Research area 3: Grid access

The World Bank identifies electricity coverage as one of the early confidence-building results that can be geographically targeted, delivered quickly and where the technology is predictable (unlike more complex governance reform). The World Bank cites quick restoration of electricity in Monrovia as one concrete, popular success that helped restore confidence in government immediately following the second Liberian civil war in 2003 (World Bank 2011, p.128).

However, in situations of violent conflict, there may be a sharp trade-off between efficient generation and resilience of electricity provision. For example, state-of-the-art electrical grids tend to benefit from economies of scale by having fewer generated located close to fuel sources and far from consumers (since coal, gas and hydro can be expensive to move). However, as the WDR team emphasises, "the technically perfect design is particularly susceptible to disruption" (World Bank 2011, p.160). For example, researchers have found that distributed electricity system based on natural-gas-fired units in Afghanistan is five times less sensitive to measures of systematic attack than traditional systems based on large centralized plant (Zerrifi et al. 2002).

This is another case where a ‘best fit’ strategy may deviate significantly from ‘best practice’. Indeed, there may be sharp trade-offs between increasing energy reliability, expanding grid access, and promoting efficient and productive use. For example, Lebanon’s development of small-scale, private electricity generation capacity was a “technically less than perfect” strategy

that was nonetheless “robust to circumstances” following the end of the 15 year civil war in 1990 (WDR 2011, p.160). One of the key challenges for Lebanon is to transition away from this inefficient electricity system that emerged during the civil war, which resulted in high rates of mini-grid access but costs that are over double those of publicly-generated electricity.

The lessons of Lebanon’s short-term success with private-sector provision may not be transferable to all fragile and conflict-affected situations. For example, the WDR notes that the success of an attempt to pursue a similar strategy in Iraq amidst war in the mid-2000s was limited as a result of attacks targeting small private power suppliers, a “weaker tradition of private entrepreneurship” and higher historical expectations of public service delivery (2011, p.160). As a result, continued obstacles to electricity provision undermine the “legitimacy of the central government as it seeks to re-establish its authority over much of the country” (Al-Khatteeb and Istepanian 2015) and increased electricity supply have contributed to reductions in insurgent violence in areas of political grievance during the insurgency (Shaver and Tenorio 2014).

Weak public sector capacity to deliver energy reliably, efficiently, and effectively in fragile and conflict-affected situations has led some to experiment with (often solar) hybrid mini-grids. These offer the potential of some of the economies of scale (and therefore efficiency) of a grid without the dependence on a large-scale public grid or back-up generator. DFID-funded programmes in Somalia and northern Nigeria have both adopted this approach and are seeking to generate lessons to guide decision-making in other conflict-affected contexts (ESRES 2017; Solar Nigeria Programme 2017). Households using off-grid renewable solar power can also subsequently connect to the national grid if the conflict context changes (Watkins 2015).

Reliance on on-grid energy access may also exacerbate vertical or horizontal inequalities that drive patterns of marginalisation and underpin conflict dynamics. For example, existing grids in sub-Saharan Africa favour wealthier communities and reproduce the disadvantage of those who live in communities cut off from grid access (Oxfam 2017). Changes to the geography of electricity grid connectivity therefore in theory offer the opportunity to alleviate or worsen conflict drivers in divided communities.

Key takeaways for EEG

- What are the context-specific factors (including conflict dynamics) that influence the trade-offs involved in expanding grid access in fragile and conflict-affected situations, and how can these be effectively incorporated into decision-making and planning processes?
- What are the challenges and opportunities for adopting hybrid mini-grid technologies in fragile and conflict-affected situations?
- How can off-grid and hybrid mini-grid solutions be ‘future-proofed’ to enable easy connection to a national grid if the conflict context changes?

2.4 Research area 4: Renewable energy

There is no clear association between renewable energy as a group of diverse energy sources, fragility and conflict. Large-scale renewable energy production may pose particular risks of creating or exacerbating conflict given its propensity to require relatively larger areas of land: whether for hydropower dams and reservoirs, concentrated solar power farms, or biofuel plantations. However, offshore wind energy and PV technologies may be less demanding in this respect and be less vulnerable to disruption by armed conflict (Johansson 2013).

There are a number of causal pathways by which changes in land ownership and usage resulting from energy projects can influence conflict dynamics. The most obvious pathways include the effects of displacement, ecological disruption and threats to existing livelihoods at the local level. Indeed, research into 58 conflict cases arising from industrial tree plantations (a sector with similar properties to biofuels) has found that displacement and replacement of local uses of ecosystems with monocultures are the prominent drivers of conflict cases and social unrest (Gerber 2011). Likewise, planning and construction of hydroelectric dams has been associated with increased tensions in Cambodia, Lesotho, Myanmar, Sudan and Uganda amongst others (USAID 2010; OPIC 2014). Early engagement, robust transparency and clear communication, multi-stakeholder planning processes, and inclusion of local partners in project success have all been identified as practices that contribute to a reduction in the risk of conflict with communities in energy and infrastructure projects at the local level (OPIC 2014).

The case of Myanmar discussed in Box 3 highlights the potentially far-reaching impact that renewable energy projects can have on national level conflict dynamics. In Sudan, too, local protests against the Kajbar and Dal dams and long term patterns of social and economic exclusion of the Nubian people intersect with national dynamics. This led opposition against the dam to become a rallying call for the Kush Liberation Front and their calls to replace the national government (USAID 2010, p.3).

Box 3: Myanmar's hydropower revolution and peace process

With three major river basins falling within its borders, Myanmar has huge potential for hydropower estimated at 108 GW, of which less than 3 GW is currently harnessed (GoM NEMC 2015, p.190). However, since the country gained independence in 1948, a series of ongoing conflicts between the Government of Myanmar and ethnic armed groups (EAGs) both reflects and deepened distrust between local non-Bamar communities and government. The presence of key hydropower sites in areas where these communities live poses a significant obstacle to development of Myanmar's hydropower resources.

Although hydropower offers the prospect of access to electricity for the estimated 52% of the population without such access in 2014 (World Bank 2017), tensions between local communities (often including EAGs), hydropower developers and the Government of Myanmar pose a significant obstacle to realising this potential. The Burma River Networks (BRN) has accused planned dams as "fuelling war" with at least 50 clashes occurring between EAGs and army and many thousands of displaced people fleeing fighting allegedly as a result of the dams (BRN 2013).

Hydropower development has therefore become intractably interlinked with the peace process. Perhaps the most high profile example of this was the Myitsone dam project in Kachin. The Myitsone dam was backed by Chinese developers and its construction was "partly blamed for the breakdown of the 17-year ceasefire with the Kachin Independence Army in 2011" (Brennan and Döring 2014). The subsequent suspension of the construction project for the past five years, and likely cancellation, highlights both the obstacles for infrastructure investments presented by conflict and the perception that continued hydropower development risks undermining a delicate peace process (Kristensen 2017).

The transnational nature of water basins and fluvial systems adds a further layer of complexity to the relationship between conflict and hydropower, where divergent short-term interests of downstream and upstream countries can become a source of tension. For example, the Egyptian government threatened the Ethiopian government with the use of military force in 2011 to prevent the construction of the 6000 megawatt (MW) Grand Ethiopian Renaissance Dam on the Blue Nile, which will reduce the flooding which is crucial to livelihoods of riverine populations and agricultural sectors downstream (Adelphi 2016). The extent and permanence of this reduction depends on a decisions taken by the governments of Egypt, Ethiopia and Sudan, including relating to water usage and generation and sharing of efficiency gains from moving reservoir waters upstream. The ability of each of these governments to navigate strong pressures from domestic constituencies will be a major factor in determining how conflict dynamics unfold over the coming years. Even putting aside the potential for interstate armed violence, increased tension between countries may 'do harm' by limiting prospects for increased international cooperation on other issues such as trade,

migration and climate change. Strong transboundary water governance mechanisms will be necessary to manage emerging tensions in subregions with major potential for hydropower energy production, including the Eastern Africa subregion and Central Asia (UNECA 2013).

Key takeaways for EEG

- What are the lessons from different stakeholder engagement approaches in large-scale renewable energy projects that could help inform local conflict prevention and mitigation strategies?

- What are the international dimensions of energy sector cooperation or conflict and how can institutional mechanisms for international dispute resolution be strengthened to prevent escalation of conflict and realise the potential of trasnational energy sources?

3 Conclusion

This short note has highlighted how fragility, conflict and violence interact with the energy sector in important and sometimes unexpected ways. Whilst fragile and conflict-affected situations often face greater energy needs, increasing access to reliable, efficient and affordable energy is particularly challenging in these contexts.

Fragility and conflict can destroy the physical infrastructure underpinning existing energy generation and distribution networks, weaken the effective governance and regulation of the energy sector, undercut the purchasing power of energy consumers, and deter energy sector investment decisions in the face of uncertainty. At the same time, the lack of reliable, efficient and affordable energy creates the structural conditions for conflict and is an obstacle to sustainable war-to-peace transitions. The combination of these factors mean that the energy sector constitutes a key economic dimension of the 'conflict trap'.

However, fragile and conflict-affected situations are highly heterogeneous and the relationship between the energy sector and fragility is dependent on the particular context. This contextual features include (but are not limited to): the vulnerability of physical energy infrastructure to disruption; the expectations and needs of populations relating to energy; the productivity of energy consumption; how energy provision intersects with existing conflict drivers such as patterns of socio-economic or political marginalisation. Fragility and conflict also presents sharper trade-offs between objectives or policy options. These trade-offs arise in part because of the need to balance the role of the energy sector to promote economic growth and its role in contributing towards peacebuilding. However, they also arise because of the sharper intertemporal trade-offs where optimal 'quick fix' solutions in the short term may nonetheless be sub-optimal in the long term. Finally, there is a need for conflict-sensitivity analysis to avoid 'doing harm' through interventions in the energy sector – particularly those that involve construction of large-scale infrastructure or confronting a political economy of conflict.

Despite these clear theoretical associations and numerous anecdotal reports, the stark lack of high quality empirical research into the relationship between energy, fragility and conflict highlights the urgent need for additional research on this topic. This note has suggested questions to guide future research as they relate to EEG's research areas. These questions should undergo further refinement to ensure they are 'researchable' whilst maintaining their practical, policy-oriented focus. Finally, research into the four research areas in fragile and conflict-affected situations should be carried out in a way that conforms with principles of conflict sensitivity. At a minimum, this requires ensuring that research does not 'do harm'.

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