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Dynamics of Peace and Security Interventions: A Case Study of Somalia

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Abstract

For more than twenty-five years, governments, multi-lateral organizations and NGOs have intervened in Somalia attempting to bring peace and stability to the country and region. Different system dynamics characterize four distinct phases of these interventions, determining the likelihood of conflict transformation. These dynamics result in archetypal system behaviors representative of other persistent conflicts in Africa during the same time period. Understanding and responding to these dynamics is critical to anticipating how the confluence of international interventions impact human security, and prospects for sustainable peace in civil conflict. Field interviews in combination with comparative statistical data informed a system model of these dynamics in Somalia. The model is used to explore the relative impact of intervention feedback loops and key levers for conflict transformation. It is shown that sustainable peace depends less on the appropriate sequencing of aid than on transparency, trust, and cooperation between humanitarian aid workers in the field, peacekeeping soldiers, local community, and representatives of NGOs, multilateral organizations, and government. Technical innovations are needed to build transparency and trust between intervention stakeholders without increasing security risks. A potential solution is proposed incorporating predictive analytics into peer-to-peer networks for monitoring interventions at the local level.

Motivating Research Questions

Even as the potential for great power confrontation has increased in recent years, violent civil conflict remains one of the greatest threats to human security and global peace. Persistent armed civil conflicts – those that have been active for twenty years or more with repeated cycles of violence and recurring civil wars– are the dominant form of armed conflict in the world today [1]. In Africa alone, more than 35 such conflicts continue to pose the utmost challenge for conflict resolution despite investments of over a trillion dollars in peacebuilding and foreign aid by the international community,[i] and the engagement of over 100,000 uniformed personnel in peace operations [2, 3]. These conflicts resulted in more than 65 million forcibly displaced persons worldwide in 2017 [4]. This record high is an increase of 20 percent from the previous year. [ii]

Failures to transform conflict and achieve sustainable peace raise difficult policy questions of when and how aid and peacekeeping interventions can best achieve their objectives in conflict settings -- considering normative, material, economic, political and technical factors. The research described in this paper is motivated by three questions:

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1. Are intervention failures due to unsuitable intervention policies, insufficient resources, the fundamental intractability of the conflicts, or some combination of all?
2. What are key levers that might change the dynamical responses to interventions and reduce the risk of failures?
3. How might engineering and technology enable these levers?

Literature on the impact of humanitarian aid in conflict settings shows conditions under which humanitarian aid may support war instead of peace, and the implications for human security. For example, large quantities of fungible aid introduced in low-security settings are at high risk of being co-opted by combatants and increasing violence against citizens [5,6]. Unintended consequences of neutral aid (e.g., material support to alleged or potential terrorists or other combatants), has been shown to increase risk to refugees and promote arms races between combatants [7, 8]. In addition, empirical evidence shows that both the anticipation of foreign aid and its sudden withdrawal may increase the risk of civil war onset and its persistence [9, 10, 11]. At a minimum, absorptive capacity of aid recipients must be factored into the decision-making and programming of aid donors to reduce these risks in conflict settings [13]. During conflict, absorptive capacity is degraded, and resources are likely to be diverted [14]. Transparency of aid donations is necessary to enable local accountability to reduce corruption and the empowerment of new conflict actors in these cases [15, 16, 17].

The peacekeeping and peacebuilding literature suggest that sequencing of aid is critical – with emphasis on security measures (e.g., external military peace enforcement, peacekeepers, and police) to reduce violence between belligerents and protect citizens, prior to a build-up of aid and development programs, conditional upon reform of government institutions [20, 21]. However, neutral UN peacekeepers alone have been shown to be ineffective during fighting [21], requiring multi-lateral enforcement operations that include non-UN, third-party peace-making partners [22, 23, 24]. Hypothesized causal mechanisms include reducing the security dilemma by solving information and commitment problems, and reducing spoiler opportunities [25, 26].

Pressures generated among the donor community often constrain strict adherence to the principles of security, transparency, accountability, absorptive capacity for humanitarian aid in conflict settings, with policy choices often conforming to the “least bad” principle rather than the “do no harm” principle. Moreover, research to advance understanding of how interactions between causal mechanisms in conflict that determine the success or failure of aid, on balance, to increase human security and resilience without contributing to the resilience of belligerents and exacerbating conflict has been hampered to date by two factors: (1) lack of longitudinal data of sufficient granularity and quality for comparative analysis, and (2) paucity of interdisciplinary research at the local level accounting for interactive affects between interventions of peace operations and humanitarian aid.

Academic researchers, practitioners and policy makers recognize that a systems approach is critical to address these gaps. For example, the US Department of Defense (USDOD), European Union Military Commission (EUMC), the World Bank, the US Agency for

International Development (USAID), United Nations Security Council (UNSC), and the United Nations Development Program (UNDP) have all called for more system-based approaches to doctrine, policy, and operations that account for interdependencies between different intervention vectors in conflict settings, as well as multiple levels of policy implementation.[iii] Such an approach must consider not only the nature and context of the conflict, but also the scope, timing, and dynamic interactions among different modes and types of aid and peacekeeping interventions. Yet the right balance and coordination among security assistance, military peace operations, humanitarian relief aid, and long-term peacebuilding remains an elusive goal. As noted during the debate on United Nations Security Council Resolution for Conflict Prevention (UNSC 2171), system approaches are often at risk of being "little more than a thematic vision". [iv]

Research Approach

Regression analysis of twenty-five years of data on thirty-five persistent armed civil conflicts in Africa between 1992-2017 (Figure 1) informed the creation of a systems framework to explain the relationship between conflict persistence and structural factors determined by the interactions of with conflict settings, peacekeeping and aid interventions. This framework was tested against four phases of the Somalia conflict from 1992-2017 (Figure 2). in a case study that employed district level quantitative data and qualitative data from field interviews in Africa, Europe and the US. In Phase I of the Somali conflict, UN troops provided humanitarian relief under the protection of UNITAF security forces. Phase II was characterized by limited humanitarian aid with no security or peace interventions by international or regional actors. Phase III was characterized by limited humanitarian aid and peacemaking interventions from Ethiopia, Kenya, and the UN-sanctioned African Union Mission in Somalia (AMISOM). Phase IV has been characterized by large infusions international aid with security provided by continued AMISOM operations. Over 100 interviews with government officials, Diaspora community, refugees, AMISOM peacekeepers, the African Union, UN, World Bank, and various NGOs identified conflict dynamics and intervention levers most likely to result in conflict transformation that increases human security, and those intervention pathways most likely to sustain conflict.

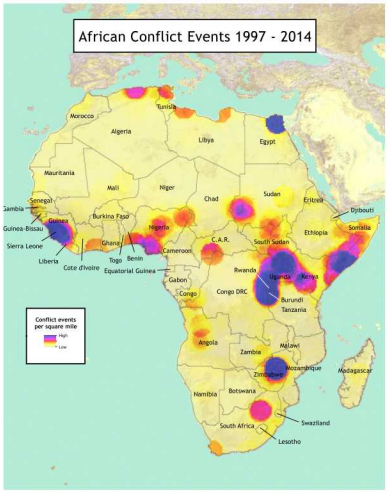

Figure 1 Heat map of violent conflict events in Africa. Data Source: Armed Conflict Location and Event Database (ACLED) Version 5 [27]

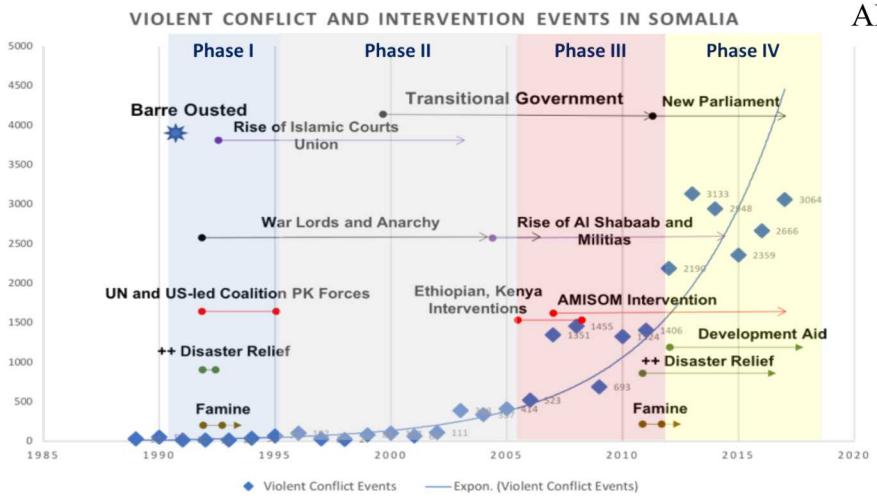

Figure 2. Four Phases of Somalia Conflict

Research Findings: System Explanations and Key Levers

Violence in the conflicts shown in Figure 1 display one of four types of archetypal system behaviors (Figure 3): Exponential Growth; Sustained Oscillations; repeated episodes of Overshoot-and-Collapse; or Damped Impulse (an intense but limited stimulus followed by gradual decline). These behaviors scale from local to state level [39]. From a system perspective, each behavior is characteristic of different underlying structural conditions in combination with resources within the system [54]. Once established, the behavioral dynamics become self-reinforcing and may dictate the likelihood of conflict persistence or transformation through interventions, where conflict persistence is associated with exponential and oscillatory behavior. In contrast, overshoot and collapse and/or damped impulse behaviors may lead to conflict transformation.

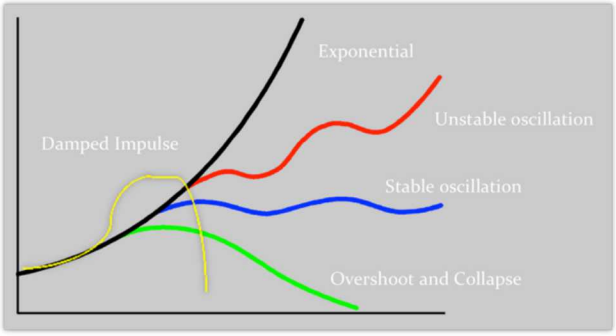

Figure 3. Archetypal System Behaviors

The statistical regression analysis revealed that the prospect of conflict transformation depends strongly on two factors—opportunity costs of conflict and gender equality, in combination with processes by which external interventions are implemented. Specifically, the likelihood of successful conflict transformation is highest when accompanied by gender empowerment and implemented through transparent, inclusive mechanisms at the local level that provide accountability, that scale from local to national levels, and that ensure coordination between security and humanitarian operations [34, 35, 36, 39]. Absent such process mechanisms, the resources provided through interventions are more likely to prolong conflict and human suffering than provide pathways for transformation [38, 39].

These findings were corroborated by the analysis of conflict dynamics in Somalia based on narratives from field interviews, in combination with district-level data. Security and aid interventions interact at local levels to reinforce conflict structures and capacities, consistent with findings in previous literature [9,12, 18]. One driver is the increased demand for security to protect aid workers and prevent cooptation by combatants when delivering humanitarian aid in conflict settings. In so doing, they become endogenous to the conflict and contribute to the resilience of combatants [19, 31, 39]. Conflict transformation must account for, and interrupt, these dependencies [35, 39].

Unintended consequences, as revealed by interviews and previous research can be that:

- Local economies become dependent on conflict-driven demands for security measures to protect aid. The creation of "security-entrepreneurs" among local populaces has been a repeated programming challenge for NGOs and peacekeeping operations in East Africa [28]. These dynamics are shown in Figure 4.[v]

- Competing "war lords" emerge to oversee aid distribution. Empowerment of rival warlords in Somalia, Liberia, and the Democratic Republic of Congo to help with UN aid delivery significantly increased the intensity and duration of violence in those conflicts [29, 30, 31].
- Communities become isolated and vulnerable in humanitarian deserts in the wake of limited peacemaking operations that may drive combatants out, but not away [32]. Combatants profit by imposing road taxes ("zaqat") where they control access of aid workers to the communities. This is a common practice by Al Shabaab in Somalia and various combatants in Syria (Figure 5).

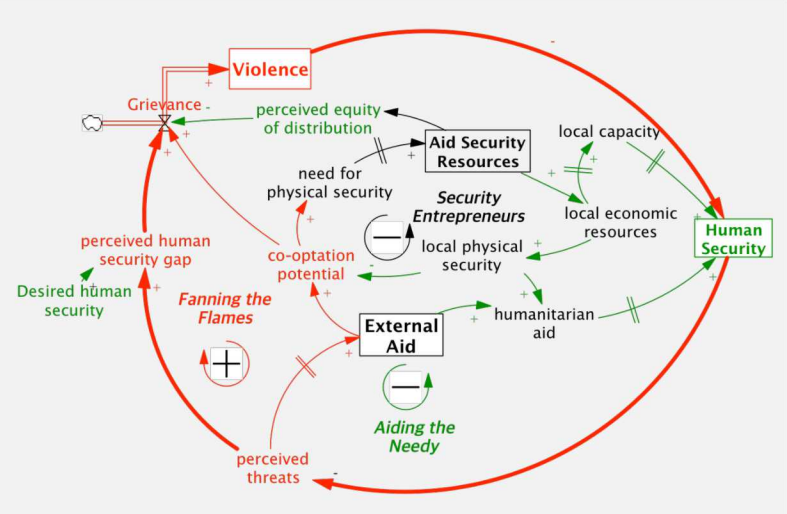

Figure 4. Economic dependence on aid security creates reliance on Security Entrepreneurs to balance conflict drivers created by co-optation.

Implications for Peace Engineering

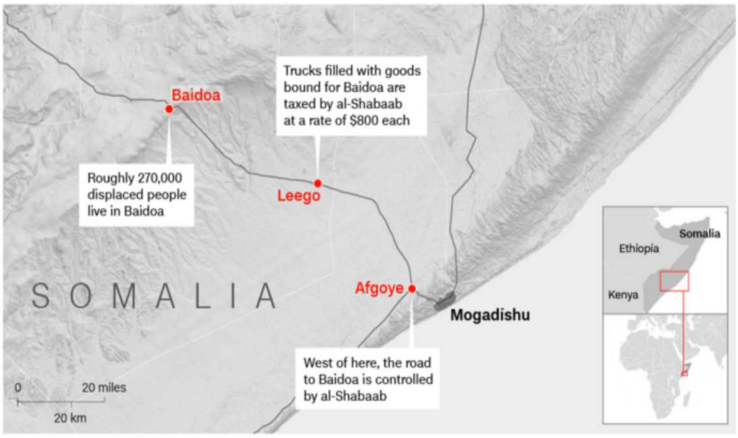

Figure 5. Al Shabaab and peace operations in Somalia. CNN 2018.

Conflict intervention policies have shifted in recent years to address the failures and unintended consequences described above. The first shift is an increased emphasis on development assistance as a means of conflict prevention. The second is increasing the use of Non-Governmental Organizations (NGOs) as the vehicles for aid delivery in conflict settings, with an emphasis on building absorptive capacity at local levels, working through civil society organizations. The third is donor emphasis on local community priorities and resilience for aid programming in conflict settings, and less on state-level metrics of development. Finally, multidimensional peace operations are increasingly deployed in active conflicts, including those that involve regional organizations (such as the European Union or the African Union Mission in Somalia, or AMISOM) and coalitions (such as the Economic Community of West African States, or ECOWAS) for peace enforcement activities as precursors to UN peacekeeping operations.

Evidence from Somalia suggest that results are mixed at best. Both the peacekeeping and humanitarian aid communities rely on normative and operational principles of neutrality and security that are usually contradictory to objectives of structural change, and rarely achievable to the ideal desired. As a result, interventions fail to create sufficiently strong levers to balance the conflict reinforcing feedback structures that perpetuate the conflict and dependency traps in Figure 4. One means for doing so would be to introduce transparent and inclusive mechanisms

for aid delivery at the local level into the dynamics that impact the variables, *perceived equity of aid distribution* and *co-optation potential* shown in Figure 4. Such transparency mechanisms should empower the local populace to hold their local leaders accountable for how the stock of *External Aid* is received and managed, without introducing additional security risks, thereby reducing the amounts necessary to be expended on the variable, *aid security resources*, increasing support to the stock of *Human Security,* and reducing the overall power of the *Security Entrepreneurs* loop.

Modeled after other peer-to-peer networks [40], distributed blockchain frameworks for public-private identity and protected, collaborative data exchanges might provide engineering solutions for such capabilities implemented on apps using trusted mobile networks. There are some indicators of movements in this direction for international humanitarian aid delivery outside of conflict settings. The Overseas Development Institute of the United Kingdom (UK) developed a networks functions approach (NFA) for advising and training the aid sector for disaster settings more than ten years ago [41]. However, at the time, technologies did not exist to overcome operational challenges. More recently, the UK Department for International Development (DIFD) commissioned a study by the GSM Association (GSMA)[vi] to study how blockchain platforms can "improve people's access to sovereign identities, bring new levels of transparency to the distribution of international aid, and improve the efficiency of humanitarian cash transfers" in support of the UN Sustainable Development Goals [42]. The GMSA study provides early evidence that blockchain technologies could help to resolve challenges in delivering humanitarian aid effectively in non-conflict settings (such as disaster relief or development) while providing Mobile Network Operators (MNOs) with new opportunities. However, the GMSA also cautioned that a clear value proposition for the MNOs could not yet be established.

Challenges for implementing such a system in conflict settings include security risks at levels not present in disaster or development scenarios. Concerns include what people might do with the information they receive, and how to protect those who provide information. Layered security should incorporate three complementary components: procedures and practices, network security technologies, and tracking technologies. Existing monitoring and evaluation principles and best practices during humanitarian emergencies could contribute to conceptual designs of the overall system to promote security [43, 44]. Technologies for network security should be incorporated to detect threats to peer-to-peer networks, protect against malicious uses, and address privacy concerns [45]. Existing technologies for tracking and monitoring humanitarian aid in insecure environments, should also be incorporated into the network data system and made available under appropriate protocols for sharing with the local populace. These include mobile phones (under appropriate conditions); digital data entry with smartphones; remote sensing with satellites, radars, or UAVs; location tracking (e.g., GPS/barcodes); radio programming and online platforms [46]. On-board predictive analytics based on voluntarily shared security information from peacekeepers and crowd-sourcing could augment monitoring capabilities (similar to current traffic monitoring apps, such as WAZE).

Cultural resistance within both donor and recipient communities may challenge implementation of such a system. However, the aid community is in the midst of significant changes in thinking about aid delivery from the local to the national and international levels. For example, in the New Deal Compact of 2012,[vii] international donors and aid recipients in Fragile States agreed to core principles of transparency, coordination, equitable access, and inclusivity for aid delivery

[47]. This compact has been implemented in Somalia but with limited success [48]. Key challenges have been the lack of coherency among humanitarian and development efforts, corruption, lack of involvement of the private and civil sectors, and lack of real engagement with Somalis [49].

Ongoing analyses of the aid delivery system call more broadly for programming designed using "on-the-ground" perspectives by both old and new players guided by principles that overcome fragmentation and volatility that leads to uncertainty and ambiguity [50, 51, 52, 53]. These new approaches are being actively discussed and debated by the international community, providing timely opportunities for technology innovation and policy changes to come together for the advancement of peace.

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References

[1] Backer, D., Bavnani, R., & Huth, P. (Eds.). (2016). *Peace and Conflict 2016*. University of Maryland and the Graduate Institute of International and Development Studies. NY, NY: Routledge Publishers.
https://reliefweb.int/report/world/2017-global-report-internal-displacement-grid-2017

[2] Bellamy, A. J., & Williams, P. D. (2015). Trends in peace operations 1947-2013. In J. Koops, N. MacQueen, T. Tardy, & P. D. Williams (Eds.), *The Oxford handbook of United Nations peacekeeping operations*. Oxford, UK: Oxford University Press.

[3] Hayden, N.K. (2018). *Balancing Belligerents or Feeding the Beast: Transforming Conflict Traps*. Center for International and Security Studies at Maryland (CISSM) Policy Brief
http://www.cissm.umd.edu/publications/balancing-belligerents-or-feeding-beast-transforming-conflict-traps-0

[4] Lennard, J. (Ed.) (2017). 2017 Global Report on Internal Displacement (GRID 2017). Norwegian Refugee Council Internal Displacement Monitoring Center.

[5] Anderson, M. (1999). *Do no harm: How aid can support peace or war*. Boulder, CO: Lynne Rienner Publishers.

[6] Korb, L. (2008). Foreign aid and security: A renewed debate? . In L. A. Picard, R. Groelsema, & T. F. Buss (Eds.), *Foreign aid and foreign policy: Lessons for the next half-century*. Armonk, NY: M.E. Sharpe.

[7] Collier, P., & Hoeffler, A. (2007). Unintended consequences: Does aid promote arms races?. *Oxford Bulletin of Economics and Statistics, 69*(1), 1-27. doi:10.1111/j.1468-0084.2006.00439.x

[8] Choi, S. W., & Salehyan, I. (2013). No good deed goes unpunished: Refugees, humanitarian aid, and terrorism. *Conflict Management and Peace Science, 30*(1), 53-75. doi:10.1177/0738894212456951

[9] Collier, P., & Dollar, D. (2004). Development effectiveness: what have we learnt?. *The Economic Journal, 114*(496), F244-F271. doi:10.1111/j.1468-0297.2004.00221.x

[10] de Ree, J., & Nillesen, E. (2009). Aiding violence or peace? The impact of foreign aid on the risk of civil conflict in sub-Saharan Africa. *Journal of Development Economics, 88*(2), 301-313. doi:http://dx.doi.org/10.1016/j.jdeveco.2008.03.005

[11] Nielsen, R. A., Findley, M. G., Davis, Z. S., Candland, T., & Nielson, D. L. (2011). Foreign aid shocks as a cause of violent armed conflict. *American Journal of Political Science, 55*(2), 219-232. doi:10.1111/j.1540-5907.2010.00492.x

[12] Sollenberg, M. (2012). *A scramble for rents: Foreign aid and armed conflict* (Doctoral dissertation). Uppsala, Sweden: Uppsala University. Retrieved from file:///Users/nkhayde/Documents/references/international%20security/civil%20conflict/humanitarian%20relief/Sollenberg2011.pdf

[13] Adler, J. H. (1966). *Absorptive capacity: The concept and its determinants*. Washington DC: Brookings Institution. Retrieved from http://pdf.usaid.gov/pdf_docs/PNABB075.pdf.

[14] *Aid delivery in conflict-affected IDA countries: The role of the World Bank*. (2004). Washington DC: International Development Association.

[15] Gizelis, T.-I., & Kosek, K. E. (2005). *Why humanitarian interventions succeed or fail: The role of local participation*. New York: Sage Publications.

[16] OECD/UNDP. (2014). Transparency and accountability for development results: Making development co-operation more effective: 2014 Progress Report (pp. 73-94). Paris: OECD Publishing. Retrieved from http://www.oecd-ilibrary.org/docserver/download/4314021ec008.pdf?expires=1460424216&id=id&accname=guest&checksum=F63BFECCCC8D4BD0792643DCB3944CC1.

[17] Mazurana, D., Marshak, A., Opio, J. H., Gordon, R., & Atkin, T. (2014). *Recovery in Northern Uganda: How are people surviving?* .Retrieved from London, UK: file:///Users/nkhayde/Downloads/Recovery%20in%20Northern%20Uganda.pdf

[18] Menkhaus, K., Sheikh, H., Quinn, S., & Farah, I. (2010). Somalia: Civil society in a collapsed state. In T. Paffenholz (Ed.), *Civil society& peacebuilding: A critical assessment* (pp. 321-350). Boulder, CO: Lynne Reiner.

[19] Shawcross, W. (2000). *Deliver us from evil: Peacekepers, warlords and a world of endless conflict*. London: Bloomsbury.

[20] Call, C. T. (2008). Knowing peace when you see It: Setting standards for peacebuilding success. *Civil Wars, 10*(2), 173-194.

[21] Hultman, L., Kathman, J., & Shannon, M. (2014). Beyond keeping peace: United Nations effectiveness in the midst of fighting. *American Political Science Review*, 17.

[22] Regan, P. M. (2002). Third-party interventions and the duration of intrastate conflicts. *Journal of Conflict Resolution, 46*(1), 55-73. doi:10.1177/0022002702046001004

[23] Sambanis, N., & Schulhofer-Wohl, J. (2008). Evaluating multilateral interventions in civil wars: A comparison of UN and Non-UN peace operations. In D. Bourantonis, K. Ifantis, & P. Tsakonas (Eds.), *Multilateralism and security institutions in the era of gobalization.* London: Routledge.

[24] DeRouen, K. R., Jr., & Sobek, D. (2004). The Dynamics of Civil War Duration and Outcome. *Journal of Peace Research, 41*(3), 303-320. doi:10.2307/4149746

[25] Fortna, V. P. (2004). Does peacekeeping keep peace? International intervention and the duration of peace after civil war. *International Studies Quarterly, 48*(2), 269-292. doi:10.1111/j.0020-8833.2004.00301.x

[26] Kirschner, S. A. (2010). Knowing your enemy: Information and commitment problems in civil wars. *Journal of Conflict Resolution, 54*(5), 745-770. doi:10.2307/20773718

[27] Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED: An Armed Conflict Location and Event Dataset. *Journal of Peace Research, 47*(5), 651-660. doi:10.2307/20798933

[28] Mohamud, A., & Kurtz, J. (2013). *What really matters for resilience? Exploratory evidence from southern Somalia*. Portland, OR: Mercy Corps. Retrieved from https://www.mercycorps.org/sites/default/files/WhatReallyMattersForResilienceSomaliaNov2013_0.pdf.

[29] *Report of the monitoring group on Somalia and Eritrea pursuant to Security Council resolution 2111 (2013)*. (2014). New York: United Nations Security Council. Retrieved from http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/S_2014_727.pdf

[30] *Somalia: Al-Shabaab - It will be a long war*. (2014). Retrieved from Nairobi/Brussels: International Crisis Group. http://www.crisisgroup.org/en/regions/africa/horn-of-africa/somalia/b099-somalia-al-shabaab-it-will-be-a-long-war.aspx

[31] Roland, M. (2007). Warlordism and terrorism: How to obscure an already confusing crisis? The case of Somalia. *International Affairs (Royal Institute of International Affairs), 83*(6), 1091-1106. doi:10.2307/4541912

[32] Menkhaus, K. (2009). Somalia: 'They Created a Desert and Called it Peace(building)'. *Review of African Political Economy, 36*(120), 223-233. doi:10.1080/03056240903083136

[33] Kiley, Sam (2018). Funding al-Shabaab: How aid money ends up in terror group's hands, CNN February 12, 2018. https://www.cnn.com/2018/02/12/africa/somalia-al-shabaab-foreign-aid-intl/index.html2 Retrieved September 26, 2018.

[34] *Somalia Human Development Report 2012: Empowering youth for peace and development*. (2012). Retrieved from http://www.undp.org/content/undp/en/home/librarypage/hdr/Somalia-human-development-report-2012/

[35] *Somalia: Current Conflicts and New Chances for State Building*. (2008). Retrieved from https://www.boell.de/en/content/somalia.

[36] Oker, I. A. A., & Habibullah, S. A. I. H. (2008). *Community-based peace processes in south-central Somalia*. Geneva, Switzerland: Interpeace.

[37] Justino, P. (2009). Poverty and violent conflict: A micro-level perspective on the causes and duration of warfare. *Journal of Peace Research, 46*(3), 315-333. doi:10.2307/25654408

[38] Schirch, L. (2013). *Conflict assessment and peacebuilding planning: Toward a participatory approach to human security*: Lynne Reinner.

[39] Hayden, N. K. (2016). Balancing Belligerents or Feeding the Beast: Transforming Conflict Traps (Doctoral Dissertation). Retrieved from https://drum.lib.umd.edu/handle/1903/18293

[40] Buford, J. F. and Yu, H. (2010). Peer-to-Peer Networking and Applications: Synopsis and Research Directions. In X. Shen et al. (Eds.), *Handbook of Peer-to-Peer Networking*: Springer Science + Business Media. < https://www.kth.se/social/files/573ed9baf27654531965883a/p2p_introduction.pdf> Accessed September 26, 2018.

[41] Ramalingam, B., Mendizabal, E., and Schenkenberg van Mierop, E. (2008). *Strengthening humanitarian networks: applying the network functions approach*. Overseas Development

Institute Background Note, April 2008. < https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/831.pdf>
[42] GSM Association (2017). *Blockchain for Development: Emerging Opportunities for Mobile, Identity, and Aid*. < https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/12/Blockchain-for-Development.pdf> Accessed September 26, 2018.
[43] Jansury, L., Moore, J., Pena, J., and Price, A. (2015). *Findings in Monitoring and Evaluations Practices During Humanitarian Emergencies*, George Washington University, Prepared for Steve Hansch, Director of Resilience Humanitarian Analysis, International Business and Technical Consultants, Inc. (IBTCI). < https://elliott.gwu.edu/sites/g/files/zaxdzs2141/f/IBTCI.pdf> Accessed September 26, 2018.
[44] Balcki, B., Beamon, B.M., Krejci, C., Muramatsu, K.M., and Ramirez, M. (2009). Coordination in humanitarian relief chains: Practices, challenges and opportunties. *International Journal Production Economics* 126 (2010) 22-34.
[45]Chien, E. (2003). *Malicous Threats of Peer-to-Peer Networking*, Symantec Security Response White Paper, Cupertino, CA. < https://www.symantec.com/content/dam/symantec/docs/security-center/white-papers/malicious.threats-peer-to-peer-networking-03-en.pdf> Accessed September 26, 2018.
[46] Dette, R., Steets, J., and Sagmeister, E., *Technologies for monitoring in insecure environments*, Secure Access in Volatile Environments Toolkit: Global Public Policy Institute, UK Aid.
[47] International Dialogue on Peacebuilding & Statebuilding: New Deal Principles, < https://www.pbsbdialogue.org/en/new-deal/new-deal-principles/> Accessed September 26, 2018.
[48] The Federal Republic of Somlia (2013), *The Somalia Compact.* <|https://eeas.europa.eu/sites/eeas/files/20130916_the_somali_compact.pdf>. Accessed September 26, 2018.
[49] Manuel, M., McKechnie, A., Wilson, G., and das Pradhan-Blach, R. (2017). *The new deal in Somalia: An independent review of the Somali Compact, 2014 – 2016*, Overseas Development Institute, London, UK.
[50] Fengler, W. and Kharis, H. (2010) *Delivering Aid Differently*, Brookings Institute
[51] Development Initiatives (2010). *Delivering humanitarian assisstance: a roadmap to beneficiaries* http://devinit.org/post/delivering-humanitarian-assistance-a-roadmap-to-beneficiaries/ Accessed September 26, 2018.
[52] Development Initiatives (2018). *Global Humanitarian Assistance Report*. http://devinit.org/wp-content/uploads/2018/06/GHA-Report-2018.pdf. Accessed September 26, 2018.
[53] Scott, R. (2014). *Imagining More Effective Humanitarian Aid: A Donor Perspective*, The Development Assistance Committee, OECD Development Co-operation Diretorate Working Paper 18. < http://www.oecd.org/dac/conflict-fragility-resilience/docs/Imagining%20More%20Effective%20Humanitarian%20Aid_October%202014.pdf>. Accessed September 26, 2018.
[54] Sterman, J. D. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. Boston, MA: Irwin McGraw-Hill.

[i] Data on foreign aid investments in recurring conflicts in Africa compiled from AidData.org https://www.aiddata.org. Accessed May 2018.

[ii] Data on displaced persons compiled from datasets of Internal Displacement Monitoring Center https://data.humdata.org/organization/international-displacement-monitoring-centre-idmc and 2017 annual report.

[iii] For example, the *US Army Counterinsurgency Field Manual 3-24* published in 2006 calls for explicit consideration of interactions between peacekeeping, stabilization, and kinetic operations while prioritizing the security of citizens in order to defeat insurgents. In her foreword to the field manual, former US Deputy Assistant Secretary of Defense Sarah Sewall calls the systems approach contained therein a "radical departure" from previous military doctrine. The EUMC also adopted a systems approach in its revised Concept for Military Planning of 2008, which calls for the integrated use of a wide range of tools across "institutions and policy areas that comprise political, diplomatic, economic, humanitarian, and military actions." < http://register.consilium.europa.eu/doc/srv?l=EN&f=ST 10687 2008 INIT>, accessed August 10, 2015. Similarly, in adopting Resolution 2171, which pledges a systems approach to conflict prevention, the UNSC recognized in 2014 that early warning, preventive diplomacy, mediation, deployment, peacekeeping, disarmament and peacebuilding are "interdependent, complementary and non-sequential" < http://www.un.org/press/en/2014/sc11528.doc.htm> accessed August 10, 2015. *The World Development Report of 2011* focuses on the interconnections between security, humanitarian relief, and development interventions. The report notes that failure to address the security of citizens, justice, access to resources, and economic development with a systems approach results in repeated cycles of violence in fragile states and makes specific recommendations for layered approaches across multiple levels. <http://siteresources.worldbank.org/INTWDRS/Resources/WDR2011_Overview.pdf> accessed August 10, 2015. Taking up this theme in 2012, the US AID hosted a summit on "Strengthening Country Systems" to explore ways to apply systems approaches being piloted by the Agency to the problems of aid effectiveness. <http://usaidlearninglab.org/events/strengthening-country-systems-experience-summit> accessed August 7, 2015. More recently, UNDP Administrator Helen Clark highlighted the need for systems approaches in her speech at the High-Level Panel on Humanitarian Financing, July 14, 2015, "Building a New Vision to Address Long-term and Recurrent Humanitarian Crisis". < http://www.undp.org/content/undp/en/home/presscenter/speeches/2015/07/14/helen-clark-speech-at-high-level-event-on-building-a-new-vision-to-address-long-term-and-recurrent-humanitarian-crisis-.html> accessed August 7, 2015.

[iv] Remarks made by Carolyn Schwalger, Deputy Permanent Representative of New Zealand at the 7247th meeting of the United Nations Security Council, "Speakers in All-Day Debate Cite Early Warning, Mediation, Cooperation with Regional Organizations as Effective Tools," UN Meetings Coverage and Press Releases, SC/11528, 21 August 2014. < http://www.un.org/press/en/2014/sc11528.doc.htm>, Accessed August 10, 2015.

[v] Figures 3 is a Causal Loop Diagram that models system dynamics based on interactions (flows) between variables. The polarity of the arrows leading into a variable indicates an increase (+) or decrease (-) that occurs in that variable based on an increase in the amount of the proceeding variable. Hash marks on an arrow indicate a delayed response. Feedback loops, indicated by clockwise or counterclockwise circles, are the consequence of closed chain of forward-directional links between variables, and also have positive (reinforcing) or negative (balancing) polarity. The dynamic behavior of the system as a whole – e.g, exponential, oscillatory, overshoot and collapse, or damped impulse – depends on the relative strength and polarity of the feedback loops and delays.

[vi] The GSM Association (GSMA) is an industry organization representing the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem. < https://www.gsma.com/>. Accessed September 26, 2018

[vii] The New Deal Compact is a key agreement between fragile and conflict-affected states, development partners, and civil society to improve the current development policy and practice in fragile and conflict-affected states. It was developed through the forum of the International Dialogue and signed by more than 40 countries and organizations at the 4th High Level Forum on Aid Effectiveness on November 30th 2011 at Busan, Korea. https://www.pbsbdialogue.org/en/new-deal/about-new-deal/ . Accessed September 26, 2018.