Chapter 11
Smart Peace and Security in Africa

Romanus Otieno Opiyo

Abstract The importance of considering Information and Communication Technology (ICTs) in the study of conflict formation and escalation has been widely recognized and researched. This is despite a widespread conviction that ICTs bears similar potential to contribute to peacebuilding and security. This chapter therefore seeks to explore the nature of conflicts in Africa cities and urban areas and thereafter seek to build a framework for understanding the possible way of linking digital platform with attainment of peace and security in African cities. The chapter's discussions is reliant on analysis of various literature focusing on the major areas of practical and theoretical relevance initiatives that address smart peace and security globally and in Africa.

Keywords Digital · Youth · Leadership · Africa and peace

11.1 Introduction

World peace and security is becoming more dynamic, complex and transnational, with intensified and increasing flows of information, people, capital and goods. States continue to be the dominant security actors, but SIPRI Yearbook 2011 underscores the growing importance of non- and quasi-state actors in shaping the global and regional security scene. While non-state actors could contribute more to peaceable outcomes, some have had a debilitating effect on peace and security.[1] This shows that attainment of peace and security in Africa does not necessarily require guns or vengeance violence, but use of other peaceful tools and technologies such as ICTs to counteract conflict.

[1] Stockholm International Peace Research Institute (SIPRI) (2011).

R. O. Opiyo (✉)
Department of Urban and Regional Planning, University of Nairobi, Nairobi, Kenya
e-mail: romanop2000@gmail.com

G. Mboup and B. Oyelaran-Oyeyinka (eds.), *Smart Economy in Smart African Cities*, Advances in 21st Century Human Settlements,
https://doi.org/10.1007/978-981-13-3471-9_11

At the global platform, issues addressing peace are well covered under Sustainable Development Goal (SDG) 16, which is focusing on promotion of peaceful and inclusive societies for sustainable development, providing access to justice for all and build effective, accountable and inclusive institutions at all levels. The goal is informed by recognition that violent conflicts have increased in recent years, and a number of high-intensity armed conflicts are causing large numbers of civilian casualties and driving millions of people from their homes.

In adopting the 2030 Agenda for Sustainable Development, world leaders resolved to build peaceful, inclusive societies as a foundation for ensuring lives of dignity for all. Sustainable development also depends fundamentally on upholding human rights and ensuring peace and security. Leaving no one behind also means reaching those most at risk, and strengthening our resolve to prevent conflict and sustain peace. It is recognized in the SDG reports that more citizen-generated data are also being used to monitor the needs and progress of vulnerable groups, which is boosted by the fact that coverage by a mobile cellular signal has become almost universal enabling people living in previously unconnected areas to join the global information society.[2]

Along with the "Sustaining Peace" resolutions adopted by the General Assembly and Security Council, the world now has, in its hands, roadmaps for reducing vulnerability, increasing resilience and averting armed conflict in a bid to attain peace.

African Continent vision as espoused in Agenda 2063 is defined as; "building an integrated, prosperous and peaceful Africa, driven by its own Citizens and representing a dynamic force in the international arena". A peaceful and secure Africa is the fourth out of seven aspirations listed by African Union. By 2023, AU commits that, all inter and intra national conflicts would have ceased and the target of silencing of all guns on the continent would have been attained. Local and national mechanisms for conflict prevention and resolution would be entrenched and functioning for the cause of peace. The African Stand by Force, the Defence and Security Policy and the African Peace and Security Architecture in general will all be in place and be contributing towards the preservation and maintenance of peace in the continent and around the world.[3]

On addressing smart platform, AU commits to increase electricity generation and distribution by at least 50% by 2020, double ICT penetration and contribution to GDP, realize at least 70% increase in broadband accessibility by 2020, and attain 100% mobile penetration by 2020 (AU 2015). From these commitments, it is clear that the Continent is keen on addressing the digital divide problem, which has disadvantaged the continent when it comes to dealing with various challenges facing the continent including the area of its adaptability in addressing critical areas of food security and conflict. This chapter will highlight the historical background of peace and security status in Africa which is assumed to have great impacts on peace in African cities, initiatives taken to attain peace and security in the continent, and lastly how ICT and related technology has been applied in attainment of peace and security in African cities.

[2] United Nations (2017).

[3] African Union (AU) (2015).

The chapter's main objective is to map out Africa's peace and security landscape in relation to application of digital and technology platforms in promoting peace and security in African cities and urban areas.

The chapter's scope in discussing peace and security in African cities and urban areas is limited to 'Peacetech'[4] initiatives such as GIS based security applications, online platforms, blogs, crisis mapping, crowdsourcing platforms, social media and mobile phone Short Message Service (SMS) which are really transforming how conflict and violence are addressed in African cities and globally. The chapter is also alive to the fact that these digital platforms also can and have been used and abused by many individuals and groups in creating conflicts whose result is disturbance of peace and security in Africa.

The rest of the chapter is divided into six parts. The next Sect. 11.2 provides the conceptualization of the chapter by discussing framework of smart peace and security, Sect. 11.3 gives an overview of drivers of threats to peace and security in Africa which is followed by Sect. 11.4 which consolidates discussion various impacts associated with conflicts in Africa, this is followed with Sect. 11.5 which brings in the discussions of mitigation to conflicts including highlighting the application of smart applications in seeking peace and security in Africa, this is succeeded with Sect. 11.6 which analyses the application and potential of ICT in African cities and urban areas.

11.2 Conceptualizing Smart Peace and Security

Due to the difficulty in forecasting the onset of large-scale violence, it is important to better understand and conceptualize new approaches to measuring the risk of it. As the Global Peace Index (GPI) has recorded in the past, the global trend in peace has been deteriorating due to the large conflicts in the Middle East, increased terrorism and historic displacement of people, which is having profound impacts on global peace and stability. While some risks can be foreseen and planned for, profoundly destabilizing events such as civil unrest, conflict onset and the collapse of entire countries have, all too often, caught the world by surprise (IEP 2017a).[5]

The basic starting point for any writings on peace is conflict. For one to appreciate how smart peace can be achieved it will be important to first have a glimpse of the nature and character of conflict in Africa. As noted by McCandless and Bangura (2007) this implies two things: an identification of the salient issues and adoption of the appropriate methods.[6]

On the question of peace and security attainment, some of the important subject of discussion to consider might be: the causes of conflict, the nature and dynamics of conflict, the patterns of conflict, the effect of conflict among others. There are

[4]Farrah et al. (2017).

[5]Institute for Economics & Peace (2017a).

[6]McCandless and Bangura (2007).

Table 11.1 Framework for conceptualizing smart peace and security

	Marginalization	Hegemony	Empowerment
Role of ICTs	Ignored and denied funding/attention; non-virtual peacebuilding	Denying access; rhetorical tool: policy legitimation	Active support through donors and agencies: ICTs producing policy input
Risks	Neglecting the potential of ICTs to reach out to broader audiences	Reinforcement of top-down dynamics	Reinforcing local power imbalances and systems of exclusion

Source Adapted by author from Tellidis and Kappler (2016)

several patterns of conflict in Africa. Thus, we have conflicts of secession, ethnic nationalism or self-determination. In discussing conflict literature in African cities in relation to ICT in order to unpack peace and security, the chapter will also rely on the **Global Peace Index** (**GPI**) which measures the relative position of nations' and regions' peacefulness. As documented in the Institute for Economics and Peace (2017b), the GPI gauges global peace using three broad themes: the level of societal safety and security, the extent of ongoing domestic and international conflict and the degree of militarization.[7]

The chapter also acknowledges that Africa is the fastest growing region in the World in terms of internet penetration, with a growth rate in internet users of 16.05% between 2013 and 2014 (more than twice as high as the global average growth of 7.85%). Of relevance to focus on Africa cities, it is noted that internet use in Africa is mainly an urban phenomena for example in South Africa only 24% of internet users are rural.[8]

Discussion of smart peace and security in African cities will therefore be conceptualized by examining the dynamic roles and potential of ICTs in attainment of peace and security. Some of the dynamics are summarized in Table 11.1 as borrowed from Tellidis and Kappler (2016), who concluded that ICTs in the field of peacebuilding, has a lesser determining role than commonly expected, they represent a tool which needs to be activated and used by those capable of and willing to use it. This conclusion will be contextualized by initiatives taken by various countries to use ICTs in search for peace.

11.2.1 Marginalization: ICTs as an Under-Explored Tool

This may be because of a lack of knowledge in terms of how to use ICTs for peace-related purposes. This does not mean that ICTs are not used at all, but instead that they

[7] Institute for Economics and Peace (IEP) (2017b).

[8] Guerriero (2015).

are used in a rather static and one-way form. In other instances, ICTs are not explored to their full potential because of fear that their impact cannot be controlled, or because of a belief that these media are not suitable to bring about change, or indeed because 'proof' of their impact is difficult to measure (Shoemaker and Stremlau 2014).[9] This shows that the improvement in statistics in terms of internet penetration and growth in cellular phone ownership should be tapped into useful tool of addressing conflicts and developing a culture of peaceful citizenry in African cities.

11.2.2 ICTs as a Tool for Hegemony

ICTs can serve as a platform on which hegemony can be promoted and existing power imbalances be reinforced, shifting the balance towards powerful institutions if the latter are able to strategically use ICTs as legitimating tools. Post-conflict Sri Lanka is one such case where the state sought to impose a victor's peace (Richmond and Tellidis 2012) by controlling new social media, which the former President's brother and Defence Secretary has branded 'a threat to national security'.[10] This is a threat to cultivation of peaceful culture and co-existence in any environment.

Information and communication technologies may be used as a hegemonic tool even in cases where there is no explicit strategy to impose a victor's peace. In South Africa, for example, the emergence of township journalism through blogging in informal settlements (Siyakhona 2011) like Khayelitsha (near Cape Town) is a striking example that reflects the extent to which internet access can help circumvent censorship in the public sphere and give a voice to marginalized communities on the one hand. On the other hand, it must be noted that while Khayelitsha benefits from access to electricity, other townships nearby (such as Malawi Town) have been denied electricity and are thus unable to participate in the use of ICT-based communication. Thus, besides the fulfilment of basic human needs, political voice is also denied to certain groups and communities.[11] This may as well represent a political strategy of keeping contestation and deviance under control. The marginalization of ICTs in broader society is in this case not only a result of 'not-knowing' or a lack of technical skills, but equally a deliberate (hegemonic) strategy of keeping certain populations at bay and under control by denying them a platform of empowerment.[12]

[9] Shoemaker and Stremlau (2014).
[10] Richmond and Tellidis (2012).
[11] Siyakhona (2011).
[12] Tellidis and Kappler (2016).

11.2.3 ICTs as a Tool of Hybrid Peace Building

The UNDP has increasingly been accepting ICTs as catalytic enablers both for e-governance as well as for the promotion of peace and development (UNDP 2013).[13] To that effect, it is now seeking to exploit the potential of games and apps in building peace and fostering positive relations between communities and between communities and institutions (Kahl 2014).[14] This approach points to the recognition that the use of ICTs can considerably enhance hybrid forms of peace as conceptualised in recent literature (Mac Ginty 2010[15]). They can do so by fomenting local access to formal peacebuilding practice(s) and thus challenge existing power biases of institutions. In that sense, ICTs can serve as platforms of resistance for actors that had previously been excluded from formal politics. This is evident in the case of Cyprus, where NGOs and the bi-communal peace formation movements have been quite isolated since the 1990s (Richmond 2012)[16] from the general public (physically, ideologically, and in terms of their approaches to the transformation of the conflict). All these platforms and initiatives use new social media (blogs, Facebook, Twitter) to organize and disseminate their activities, and to mobilize people from both sides of the island through new social media.

Such usage of ICTs does not necessarily iron out power imbalances, but can instead further cement dividing lines in society, at grassroots level. This is particularly the case in situations where certain local actors have strategies to better access ICTs and international support in this context, while others remain at the sidelines of such practices, either through a reluctance to engage with ICTs, or alternatively a lack of infrastructure or funding (digital divide). The implications of this are that ICTs should not per se be considered as agents of social change (Welch et al. 2015) in general, and peacebuilding in particular. Instead, ICTs have to be viewed in a continuous tension between disempowerment, marginalization and empowerment, and activated in different ways by the agents controlling and using them.

This chapter appreciates the continuous analogy of ICT in assessing its potential in addressing conflicts hence attainment of peace and security. The interest is on its empowerment function, where citizens in Africa cities are well positioned to take the advantage of the digital dividends courtesy of higher internet penetration rate and mobile ownership as compared to the rural areas in enhancing attainment of peace and security in the cities and to a larger extent the African continent as envisaged in Africa 2063.

[13] UNDP (2013).
[14] Kahl (2014).
[15] Mac Ginty (2010).
[16] Richmond (2012).

11.3 Overview of Drivers of Threats to Peace and Security in Africa

It is widely accepted that the major threat or great disturbance to peace and security is conflict. According to Olaosebikan (2010) conflicts in Africa may be said to have been caused by a multiplicity of factors such as: arbitrary borders created by the colonial powers, heterogeneous ethnic composition of African states, inept political leadership, corruption, negative effect of external debt burden and poverty.[17]

Africa continent is rich in natural resources such as mineral oil, diamonds, rubies and gold and with a natural abundance of flora and fauna. However the wealth of Africa as noted by Oduaran and Nenty (2008) does not translate into much in terms of development due to a concerted display of violence, some of which have tainted solutions.

Rather than take its rightful place among the rapidly developing continents of the world, African development is lagging behind due to endless civil wars, border conflicts, weak structures of democratic governance, economic mismanagement and harsh climatic conditions resulting to draughts and other natural incidents amongst others.[18] Obi (2005) probed the general root causes of conflicts, which are a threat to peace and tranquility in Africa and noted that these are located in:

1. The arbitrary manner with which colonial boundaries were imposed on Africa;
2. Misrule and authoritarianism;
3. Socio-economic and political contradictions.

These have caused violent conflicts to what Obi (2005) has identified as the sudden release of pent-up grievances and rage that had been suppressed by authoritative regimes backed by the World's super powers.[19] DFID (2001)[20] identified four distinct types of conflict in Africa namely;

a. **Conventional Warfare-Wars of Attrition**

This refers to a type of war which makes extensive use of expensive technology such as heavy artillery and jet fighters. It is fought with regular troops along a defined series of fronts. A good example is the conflict between Ethiopia and Eritrea.

b. **Factional Warfare**

In such wars, there is rarely a defined front line and fighting is frequently opportunistic rather than strategic. Frequently these conflicts move rapidly from the original cause to revolve around the exploitation of commercial, mineral and natural resources. Factions will seek to involve, exploit and control a significant proportion of the civilian population in order to sustain the conflict. Countries currently that have been

[17] Olaosebikan (2010).

[18] Oduaran and Nenty (2008).

[19] Obi (2005).

[20] Department for International Development (DFID) (2001).

affected by factional warfare are Somalia, Liberia (internally), Uganda (internally) and Namibia.

c. **Genocide and Ethnic Based Conflict**

Centrally directed and involving the virulent use of propaganda, these conflicts spread like wildfire and leave a huge death toll, massive displacement, fear and confusion. Ethnic and genocidal fighting tends to be extremely low tech using knives, machetes and occasionally small arms. A distinguishing characteristic is the speed with which genocidal attacks take place and the high degree of central organization and planning involved. Examples of countries to have experienced genocide and ethnic based violence are many; Rwanda, Nigeria, Burundi and Kenya among others.

Another emerging concern which is closely related to ethnic conflict is xenophobia violence. As noted by Adjai and Lazaridis (2013), In South Africa, this occurs in urban informal settlements, owing to the socio-economic circumstances, where black South Africans establish homes in the informal settings surrounding major cities. Likewise migrants, particularly refugees struggling to access housing and experiencing delays in gaining refugees status also end up setting homes in those urban informal settlements. The presence of the foreigner, who is in close proximity, is deemed a threat to black South African's access to resources, particularly in the informal sector.[21]

d. **The "New Warfare"—Regional Conflict**

All three elements of warfare have coalesced into what can be described as Africa's "new warfare"—regional conflict. In this type of conflict, conventional state forces are frequently engaged in the protection of key installations, or may find themselves engaged in capital intensive, attritional warfare with other states. Extensive use is also made of factional forces that act as proxies and as a forward line of protection for conventional forces. These proxy forces are encouraged to be self-sustaining through the exploitation of natural resources. The war in the DRC involves the armed forces of eight countries while the DRC has sought to take the war back into Rwanda, Burundi and Uganda.

e. **"Youth Bulge" and Conflict in African Cities**

Though not listed by DFID as distinct type of conflict in Africa, the youth explosion in Africa in relation to conflict and attainment of peace require special attention. This is given by the fact that the youth in most African cities make up at least 60% of the urban population, yet most programs in these cities rarely address their needs for employment, recreation, health, education and other specific problem. During wars or conflict, most of them are vulnerable hence can radically transform the nature of the conflict since they have nothing to lose, since they feel unwanted and un-provided for by the existing authorities.

According to IEP (2017b) youth development policies often increase budget funding for education and thereby improving the High Levels of Human Capital Pillar.

[21] Adjai and Lazaridis (2013).

However, unless the economy can absorb graduates into the labour market, this runs the risk of building a highly educated yet idle youth cohort. Flooding the labour market with university graduates when the economy cannot absorb them, may have a radicalizing effect and is one of the push factors used by militant organizations in recruitment of youth in Middle East and North Africa (MENA). De Benitez et al. (2003) notes that marginalized urban youth tend to be unpopular with other members of urban society, including government officials, in Africa and elsewhere. They may not be viewed as vibrant, dynamic contributors to a city's culture and daily life, being perceived instead as carriers of disease and crime. They are easily be lured to conflict situation for example the assault on Freetown by the child and youth soldiers of the Revolutionary United Front (RUF) in January 1999 dramatizes how youth alienation and furor can be manipulated to terrible and devastating effect.

11.4 Global Terrorism Index and Global Peace Index

Terrorism is an emerging conflict concern in Africa and more so in cities and urban areas. According to the Institute for Economics and Peace (IEP) (2017c) there is a particular focus on how both political terror and conflict act as drivers of recruitment for terrorist groups. The vast majority of terrorism occurs in countries that are involved in an armed conflict with terrorism in these countries accounting for 95% of all deaths and 91% of all attacks in 2016.[22]

The Global Terrorism Index (**GTI**) scores each country on a scale from 0 to 10; where 0 represents no impact from terrorism and 10 represents the highest measurable impact of terrorism. Countries are ranked in descending order with the worst scores listed first in the index.

IEP (2017c) notes that over the two years there is a decrease of 22% compared to the peak of terror activity in 2014. Terrorism deaths have fallen significantly in Syria, Pakistan, Afghanistan and Nigeria. Terrorist attacks are deadlier in conflict-affected countries where there is an average of 2.4 fatalities per attack in 2016 compared to 1.3 fatalities in non-conflict countries.

From Table 11.2, the vast majority of terrorism occurs in the Middle East and North Africa (MENA), South Asia and sub-Saharan Africa regions. Collectively these regions account for 84% of all attacks and 94% of deaths. In contrast, Central America and the Caribbean accounted for the lowest levels of terrorism with only 0.05% of attacks and deaths. Sub-Saharan Africa has been the most deadly region in terms of fatalities per attack with an average of 4.8 deaths per attack in 2016.

Further analysis shows that out of the top 36 countries having a GTI score of 5 and above, 15 of them were African Countries, which is approximately 41.6%. As shown in the table Nigeria, Somalia and Libya rank among the top ten countries globally and top 3 in Africa in terms of GTI.

[22] IEP (2017c).

Table 11.2 Global terrorist index for countries scoring GTI 5 and above

Country	GTI score	Global rank	Africa rank
Iraq	10	1	
Afghanistan	9.441	2	
Nigeria	9.009	3	1
Syria	8.621	4	
Pakistan	8.4	5	
Yemen	7.877	6	
Somalia	7.654	7	2
India	7.534	8	
Turkey	7.519	9	
Libya	7.256	10	3
Egypt	7.17	11	4
Philippines	7.126	12	
DR of Congo	6.97	13	5
South Sudan	6.821	14	6
Cameroon	6.787	15	7
Thailand	6.609	16	
Ukraine	6.557	17	
Sudan	6.453	18	8
Central African Rep.	6.394	19	9
Niger	6.316	20	10
Bangladesh	6.181	21	
Kenya	6.169	22	11
France	5.964	23	
Ethiopia	5.939	24	12
Mali	5.88	25	13
Saudi Arabia	5.808	26	
Lebanon	5.638	27	
Burundi	5.637	28	14
Colombia	5.595	29	
Palestine	5.551	30	
China	5.543	31	
USA	5.429	32	
Russia	5.329	33	
Chad	5.269	34	15
United Kingdom	5.102	35	
Israel	5.062	36	

Source Compiled from IEP (2017c)

In 2016, sub-Saharan Africa was the fourth worst performing region with 51 different terrorist organizations carrying out at least one attack in the region. There were a total of 1,450 attacks that resulted in 4,715 deaths. Since 2002, Sub-Saharan Africa has also seen the second largest deterioration in its GTI score in deteriorating by 60%. At the same time, the region has witnessed the biggest improvement in terms of GTI with Angola improving its score by 98%, from a score of 6.382 in 2002 to 0.154 in 2016. Since 2002, 14 of the 44 countries in sub-Saharan Africa have improved their terrorism scores while nine saw no change and 21 deteriorated.

Nigeria and Somalia have experienced both the highest numbers of attacks and the highest death toll in the last 15 years primarily due to Boko Haram and al-Shabaab. Of the 35,559 people killed in terrorism attacks since 2002, 65% of the fatalities and 70% of the attacks occurred in these two countries.

Global Peace Index (GPI) for Africa

The GPI covers 99.7% of the world's population, using 23 qualitative and quantitative indicators from highly respected sources and measures the state of peace using three thematic domains: the level of Societal Safety and Security; the extent of Ongoing Domestic and International Conflict; and the degree of Militarisation. All scores for each indicator are normalized on a scale of 1–5, whereby qualitative indicators are banded into five groupings and quantitative ones are scored from 1–5, to the third decimal point (IEP 2017b).

IEP (2017b) indicate that since 2015, the Middle East and North Africa was the least peaceful region in the world and deteriorated further, although less noticeably compared with the past two years. It is also instrumental to note that Mauritius is ranked as the most peaceful country in Africa at number 22 with GPI of 1.547 as compared to the most peaceful country globally Iceland with GPI of 1.111. Only Eight countries from Africa namely; Mauritius, Botswana, Sierra Leone, Zambia, Madagascar, Malawi and Namibia are among the top 50 countries globally.

In sub-Saharan Africa, 24 of the 44 countries became less peaceful, with the largest deteriorations occurring in Ethiopia, Burundi, Mali, and Lesotho. The five worst-performing countries are all in the sub-Saharan Africa and the Middle East and North Africa regions. Ethiopia's score has suffered as a result of violent protests that led to a state of emergency giving the government significant powers to crackdown on dissidents. A similar story can be seen in Burundi where the government appears to be drifting towards authoritarianism. Mali continues to struggle to implement a 2015 peace treaty and remains under threat by jihadists, despite a UN and French military presence. Finally, Lesotho has suffered from political instability and internal security issues following a failed coup in 2014.

From the GPI computations and complexity of causes of conflict it is clear that the solution will require a pragmatic multi-disciplinary, multi-stakeholders/players approach where ICT can play a critical role in facilitating attainment of peace and tranquility in Africa cities and the entire continent. As such, policies to counter or prevent conflict in African should consider embracing of ICT and also be tailored to the specific drivers of conflict in each context.

11.5 Impacts of Conflict

From the 2017 GPI, the least peaceful countries were mainly from Africa. This scenario has been noted to have serious negative impact on the continent's development. The scale and nature of the conflict have directly affected the lives of many millions of Africans.

Various studies and reports have categorized impact of conflicts into the following;

a. **Loss of Human Lives**

Globally there has been a very significant increase in the total number of deaths from internal conflict, rising from 35,988 in 2006/2007 to over 285,000 in 2015/2016 which is 732 percent increase. Globally, deaths from terrorism rose from just over 11,000 in 2007 to over 29,000 in 2015, with the number of deaths peaking in 2014 at 32,765 (IEP 2017c).

War in Africa causes increasing suffering for civilians. They suffer death and injuries and the indirect consequences of famine and epidemic disease that have followed in the wake of war.

b. **Injuries and Deformities**

Conflict situations can lead to injuries and deformities. IEP (2017c) estimates that the number of those injured as a result of terrorism attack in the year 2016 is 14,593, with the Islamic State of Iraq and the Levant (ISIL) contributing to 50% of the total reported cases of injuries.

c. **Economics and Livelihoods**

The global economic impact of terrorism in 2016 was US$84 billion. While this is a significant number in its own right, it is important to note that the economic impact of terrorism is small compared to other major forms of violence. This amount is only one per cent of the total global economic impact of violence, which reached $14.3 trillion in 2016 (IEP 2017c). According to IEP (2017b) this figure is equivalent to 12.6% of the world's economic activity (gross world product), or $1953 for every person, and is three per cent lower than in 2015. Peacebuilding expenditure is estimated to be approximately $10 billion, or less than one per cent of the cost of war.

Violent conflict can deny people access to their land at critical growing or planting periods, increase the costs of agricultural inputs, disrupt markets and restrict sales of produce. The use of landmines for example, in countries like Angola has severely limited access to land for the long term. Agricultural production and family livelihoods have suffered dramatically as a result.

d. **Refugees and Displacement**

The global number of refugees under UNHCR's mandate was estimated to be 16.1 Million at the beginning of 2015. With 4.4 million individuals, the Sub-Saharan Africa region hosted the largest number of refugees. Refugees originating from five countries (Somalia, South Sudan, the Democratic Republic of Congo, Sudan and

the Central African Republic) accounted for 3.5 Million (80%) of the total refugee population residing in this region by the end of 2015.[23]

According to De Benitez et al. (2003) from Angola to Sudan and the Democratic Republic of the Congo to Sierra Leone, hundreds of thousands of people displaced by wars have sought refuge in capital cities. For example, Freetown, the capital of Sierra Leone, saw its population rise from 384,499 in 1985 to an estimated 837,000 in 2001 (Africa South of the Sahara 2002, 926). This 217 percent increase mainly took place during the decade of civil war (1991–2001) and may not have accounted for internally displaced persons (IDPs) living in the Freetown area, which were thought to have reached 500,000 by 1995 (Synge 2002, 920) and remained a significant population throughout the latter stages of the war.[24]

Internal displacement and refugee flows have a serious effect on the economy and the environment. The denial of access to the land by military factions has led displaced people to congregate in cities and surrounding areas. Uprooted populations lose access to any means of production and put enormous pressure on government services. Refugees and the internally displaced put pressure on fuel and water resources. The World Bank estimates that in Africa the total direct cost of refugees to their hosts is in the region of $530 million per year.

e. **Loss of Infrastructure and Services**

War has seriously damaged Africa's infrastructure. Roads, rail, ports, airports, electricity, water supply, sewers and telecommunications have all been affected. During war there has been a dearth of investment in and maintenance of infrastructure. Over the past twenty years Africa has lost over fifty per cent of its transport infrastructure, many of the losses due to conflict. This loss has both an immediate and a long term impact on African economies. In immediate terms, it increases impoverishment. For example, South Sudan has almost no viable road network as a result of years of civil war.

Recent wars have also led to the destruction of the basic social infrastructure. Schools and health centres are increasingly the targets of military activity. During the fifteen-year war in Mozambique, over 40% of health centres and schools were destroyed. The situation is similar in most conflict-affected countries.

f. **Governance and Investments**

Changes in the quality of governance resulting from conflict further contribute to the economic losses of war. It is common for armed crime to increase substantially during a period of conflict. Business then concentrates on reducing its exposure to risk by supporting those activities that require no long-term investment and by making strategic alliances with armed groups either for protection or gain. This is followed by a downward spiral in both domestic savings and inward investment. The economy becomes dependent on the exploitation of easily extractable natural resources.

[23] UNHCR (2016).

[24] De Benitez et al. (2003).

g. **Child Soldiers**

Children have become one of the main targets of violence and in turn are being used to perpetuate it. Children are deliberately indoctrinated into a culture of violence and used as a specific instrument of war. Militia groups and irregular armed forces such as the Lord's Resistance Army in Uganda, the *Interahamwe*[25] in Rwanda/DRC, the *RUF*[26] in Sierra Leone, UNITA[27] in Angola, and formerly *Renamo*[28] in Mozambique, have made a practice of forcibly recruiting children and initiating them through acts of violence against their own community. There are several reasons why children are recruited as soldiers. They are more docile, complain less and are easily moulded into ruthless fighters. They can easily carry and use lightweight but high-powered weapons.[29] According to IEP (2017b), child soldiers' prevention and demobilization is identified as one of the peacebuilding expenditure line under core peace building in addressing basic safety and security.

h. **International Impact**

Conflict also has a major effect on the environment through uncontrolled exploitation of natural resources. Organized crime also benefits from conflict in Africa, through arms deals, money laundering and drug smuggling. Europe in particular has to cope with the consequences of the increasing flows of asylum seekers and economic migrants from Africa (DFID 2001).

11.6 Response to Conflicts

Peacebuilding involves a range of measures aimed at preventing a country from falling or relapsing back into violent conflict by strengthening a specific set of capabilities. Peacebuilding activities are defined under three priority areas: basic safety and security, supporting the political processes, and supporting core government functions. This is distinct from peacekeeping and peace-making activities, which broadly involve the activities aimed at ending violence and establishing security (IEP 2017b).

---

[25] Is a Hutu paramilitary organization. Originally the youth wing of ruling party of Rwanda, the MRND, during the Rwandan Genocide the term "Interahamwe" widened to mean any civilian bands killing Tutsi.

[26] A terrorist group formed in the 1980s in Sierra Leone; seeks to overthrow the government and gain control of the diamond producing regions; responsible for attacks on civilians and children, widespread torture and murder and using children to commit atrocities.

[27] An Angolan nationalist movement founded in 1966 by Jonas Savimbi (1934–2002) to fight Portuguese rule. After independence was achieved in 1975 UNITA continued to fight against the ruling Marxist MPLA; a ceasefire was agreed in 2002.

[28] Is a militant organization and political movement in Mozambique.

[29] http://www.un.org/esa/socdev/rwss/docs/2001/15%20Armed%20Conflict.pdf.

a. **Response by International Community**

The international community mainly through United Nations (UN) missions has been successfully in ending more armed conflicts and reducing the number of deaths from organized violence. But as the overall GPI results show, peacefulness has declined in many parts of the world since 2008.

The UN has been seeking not only to find its role in addressing new technologies but also to integrate these technologies into its other areas of work. This integration is more advanced in some areas than in others. For example, the growing role of technology in sustainable development was highlighted in the outcomes of a number of major UN conferences in 2015. In other areas, such as peace and security, the UN is earlier in the process of integrating new technologies into its work.[30]

The UN has expanded the mandates of peacekeeping operations to increasingly provide multidimensional peacebuilding support in a variety of contexts, meaning that the UN no longer needs to wait for a comprehensive peace agreement to be in place before deploying peacekeepers.

The number of active peacekeepers has doubled in the past 25 years, from roughly 50,000 to nearly 100,000 deployed personnel. At the start of 2017, there were 21 active peace operations around the world. Of the 100,000 deployed personnel, about 85% of peacekeepers are military troops and 15% are police and experts or military observers. For the 12-year period 2002–2013, peacebuilding expenditures averaged US$13 per capita, per year, for conflict-affected countries. This is less than half of the needed level of peacebuilding, which IEP estimates at US$27 per capita. Based on IEP's model of the cost-effectiveness of peacebuilding, the total peace dividend that the international community would reap if it increased peacebuilding commitments over the next ten years could be as high as US$2.94 trillion (IEP 2017b). The doubling in number of deployed peacekeepers is an indication of goodwill of the international community willingness to address conflict situations. This is also where usage of ICT can be explored in monitoring situations in conflict prone areas.

b. **Response by African Union**

Conflicts in Africa are diverse and complex, and efforts at managing and resolving them are mixed. Aal (2015) has identified several responses to conflict in Africa namely;

(a) Increase elite incentives to negotiate an agreement (or consent to elections), rather than using force to settle the dispute,
(b) Limiting access to resources through transparency measures, sanctions or aid suspension. This may indeed change the equation, both for rebels and governments pursuing violent methods to promote their causes. Without access to easily convertible resources, funding war-related costs may prove prohibitive.
(c) In response to institutional weakness and fragility usually focuses on building up more representative and responsive governmental institutions. Toward this end, the European Union has a robust institutional-strengthening program for the

[30] Independent Commission on Multilateralism (ICM) (2016).

African Peace and Security Architecture "to enhance continental and regional capabilities for the prevention, management and resolution of conflict".

(d) Raising the cost of violence certainly lies behind a large part of international action to manage conflict in Africa, mainly through international military or security interventions.

According to Aal (2015), in mid-2014, the United Nations was involved in nine active peace operations in Africa—Mali, Darfur, Abyei, South Sudan, CÔte d'Ivoire, Liberia, the DRC, Western Sahara and the CAR. In October 2014, the European Union had military operations in Mali, the CAR and Somalia, and security-oriented civilian missions in Djibouti, Tanzania, the DRC, Niger, Mali and Libya. Some of the operations are joint, some coordinated and some are sole-actor, but with 20 or more peace and security missions occurring in Africa in 2013 and 2014, it is a crowded field.

Initiatives by African Union[31]

1. **Africa Peace and Security Architecture (APSA)**

It is a continental framework for the promotion of peace, security and stability in Africa. It is supported by the Protocol relating to the Establishment of the Peace and Security Council of the African Union, and the Common African Defence and Security Policy (CADSP). The Protocol was adopted by the AU assembly on 9 July 2002 in Durban, South Africa, and entered into force in December 2003. CADSP was adopted by the AU Assembly on 28 February 2004 in Sirte, Libya. It is under the overall leadership of the AU Peace and Security Council.

2. **African Standby Force (ASF)**

It is one of the pillars of the Peace and Security Council established under Article 13 of the Protocol Relating to the Establishment of the Peace and Security Council of the African Union. It is composed of five brigades from ECOWAS, SADC, ECCAS and Eastern and Northern geographical regions of Africa.

3. **Panels of Wise Africans (PanWise)**

It is a continental network that brings together panels or bodies of wise Africans under the AU Panel of the Wise umbrella to promote peace, security and stability on the continent.

Smart Applications to Attainment of Peace and Security in Africa

Information and Communication Technologies (ICTs) have greatly transformed societies, cultures and economies as well as created both new opportunities and threats for humankind (Sabadello 2010)[32]

Some of the way application can be applied in attaining peace and security in Africa are:

[31] AU (2015).

[32] Sabadello (2010).

a. **Crowdsourcing**

It is a widely known fact that, one of the major causes of conflict in Africa is political mistrust including sham elections. Use of crowdsourcing can enable reduce such suspicion and provide legitimacy to electoral process in Africa.

Crowdsourcing presents an opportunity to empower citizens and transform the state-society relationship. The term "crowdsourcing" was originally defined as the use of new technologies and social media to solicit contributions or share real-time information, generally in a business context.

According to Lehdonvirta and Bright (2015), crowdsourcing has the potential to augment more traditional routes for participation, such as elections and referenda. It can make government decision-making processes more inclusive and transparent and allow citizens to assess their outcomes, indirectly increasing their legitimacy.[33]

In Kenya For example, the **NGO** *Ushahidi* (Swahili word for witness) has developed crowdsourcing platforms that were originally designed as a website that was developed to map reports of violence in Kenya after the post-2007 election fallout. The original website relied on reports submitted via the web and mobile phone and presented this information on a Google Map. This website had 45,000 users in Kenya, and was the catalyst for subsequent platforms. Since then, the name "*Ushahidi*" has come to represent the people behind the "*Ushahidi* Platform". The *ushahidi* concept has also been in a variety of conflict settings including the Democratic Republic of Congo, Gaza, and Afghanistan. With its focus on user-generated information, *Ushahidi* is designed to be adaptable to SMS, mobile phone usage, and internet posts. Whilst, traditional information management systems are typically closed and controlled, *Ushahidi* is open and decentralized.[34]

b. **Networking**

Mobile phones and social media also present opportunities to empower citizens and transform their relationship with the state. Real-time photos and videos uploaded to social media can expose government corruption or abuse and increase government responsiveness to citizen concerns. These technologies have also revolutionized people's ability to organize and coordinate protest movements, a good example being the popular Arab uprisings in Tunisia, Morocco, Algeria, Libya and Egypt.

While new technologies can facilitate the rapid spread of ideas, this can have both positive and negative consequences. The easy manipulation of information and sources and the risk of viral dissemination without verification can propagate misinformation.

c. **Early Warning System**

ICTs provide opportunities to collect data about crime and conflict and reduce the gap between warning and response. For example, crisis mapping, social media mapping, and crowdsourcing tools can help generate data on conflict indicators.

[33] Lehdonvirta and Bright (2015).

[34] Staffacher et al. (2011).

Regional organizations are also taking advantage of new communication tools to better protect their citizens. The Inter-Governmental Authority on Development (IGAD) in Eastern Africa has developed a Conflict Early Warning and Response Mechanism (CEWARN) in order to respond to and prevent conflict in their region (Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan and Uganda). In partnership with ICT4Peace, CEWARN has assessed how ICTs could be used in areas that generally have no access to communication technology, and started using high-frequency radios, satellite phones, and other technology to access areas that used to take days to travel to and review.8 Similar initiatives have also been developed by the Economic Community of Western African States (ECOWAS) within their ECOWAS Warning and Response Network.[35]

d. **Peace Operations**

Although new technologies have changed the way wars are fought, peace operations by various peacekeeping missions including UN have been slow to integrate these technologies in fulfilling their increasingly complex mandates (ICM 2016). Particularly useful for peace operations are technologies that facilitate monitoring and observation, including unarmed unmanned aerial vehicles (UUAVs), video monitoring systems, motion detectors, and satellite imagery.[36] These technologies can facilitate peace keeping operations by detecting and monitoring hostile movements virtually for protection of civilians.

e. **Peacebuilding**

New technologies offer new opportunities for managing conflict and building peace, particularly at the local level. ICTs can provide avenues for alternative discourse or community engagement that promote peace, and video games have been used to foster nonviolent attitudes and behaviors.

They use popular, commercial video games, whose themes revolve around the ideas of communication and collaboration within a virtual world. By exploiting their mass appeal, their programs aim to stimulate trust between children in Israel, Palestine, the Middle East and other parts of the world suffering from conflict.

f. **Social Media**

In Many Countries, use of Blogs, WhatsApp, Twitter and Facebook have become popular in sharing intelligence among civilians regardless of their age, socio-economic class, religion and racial affiliation. The social media has been used in spreading of peace messages during election in Kenya and in sharing of any imminent attack by outlawed gang's and also in reporting of police brutality during demonstrations.

g. **Geographic Information System**

Mapping technologies like Geographic Information Systems (GIS) and satellite imagery are also being used to engage with communities and map information that

[35] Search for Common Ground (SFCG) (Undated).

[36] Dorn (2011).

can help in forecasting trouble spots or see trends in the field. There is an increase in usage of Global Positioning Systems (GPS) and geographic information systems to map information on human rights abuses in order to, "strengthen advocacy campaigns, support legal cases, and enhance response coordination and prevention efforts."[37] The UN is using mapping in ongoing peacekeeping efforts, like in Sudan, to map where response teams are stationed. Similar initiatives are used by local community groups like Map Kiberia or Map Action to provide local information on community development issues or response efforts.

h. **Other Efforts such as ELVA, First Mile Go**

The rationale behind Elva is that the data (which may be predominantly collected over mobile phone text messages and web reports) is represented in a clear visual manner on maps and charts. With reference to "conflict transformation" approaches to peacebuilding, the platform represents how data has the potential to inform the need-focused distribution of resources by statutory and governmental bodies and agencies.

In Africa Elva has utilized these approaches in the following areas[38]:

Central African Republic: a platform that helps humanitarian actors map relevant incidents and needs of conflict-affected and displaced peoples;

Somalia: a platform that allows local organizations to carry out SMS polls on democratization issues amongst the general population;

Libya: support local organizations prevent conflict using a mobile phone based reporting platform.

First Mile Geo

First Mile Geo is a provider of Cloud Business Intelligence (BI) and Geospatial analytics. Its software enables users to collect, visualize, and monitor data, in any language, anywhere, on the fly, and through one unified interface. Data can be captured through whatever technology or third party platform deemed most appropriate (pen and paper, web surveys, SMS, mobile, tablet, etc.) and pushed into a unified system for map exploration, dashboards, and alerts across multiple languages. First Mile Geo was leveraged in Syria to collect, manage, and visualize time-series data from within Aleppo City, street block by street block during the conflict. It is yet to be used in Africa but has high potential.

i. **Use of Unmanned Aerial Vehicles (UAVs)**

The success of the UAVs and armed helicopters in the DRC is helping propel their deployment in other missions, especially in Mali and the Central African Republic. The Dutch contingent in Mali has used both UAVs and Apache helicopters with camera pods to great effect. Showing that UAVs are becoming "standard kit," the Swedish contingent in Mali deployed three types of its own UAVs, including mini-UAVs.[39]

---

[37] AAAS Geospatial Technologies and Human Rights. http://shr.aaas.org/geotech/.

[38] Young and Young (2016).

[39] Dorn (2016).

11.7 African Cities as Areas Needy but Ready for Smart Solution to Attainment of Peace and Security

Cities all over the world are vibrant urban spaces giving hope of better future especially to the young professionals. As noted by various authors (IEP 2017b; Aal 2015[40]; Muraya 2014) with a rapid increase in African urban population, resulting to an extremely high density population with a large portion living in informal settlements, which creates a perfect breeding ground for insecurity as it becomes extremely difficult to monitor all clandestine antinational activities. This has resulted to unusual activities such as radicalization, violence and terrorism which consequently result to urban terrorism, cyber terrorism and related challenges to attainment of peace and security.

In most of African cities, it is now becoming a norm, that insecurity is not only growing, fast and out of government control but is also changing into a complex outcome of increasing interaction between historical injustices, growing income inequalities, a bulging and frustrated youth population, rising levels of education, access to information and communication technology and exposure to global influence in the back drop of poverty and unemployment, self-sabotage, and experimentation and curiosity (Muraya 2014).

To further compound this problem the weakening social contracts characterized by lose of trust by citizens on state institutions and on-going political transition is not making an already bad situation any better.

ICT Status Favoring African Cities

Africa is the fastest growing region in the World in terms of internet penetration, with a growth rate in internet users of 16.05% between 2013 and 2014 (more than twice as high as the global average growth of 7.85%). Internet use in Africa is mainly an urban phenomena for example in South Africa 24% of internet users are rural.[41]

Mobile-broadband subscriptions have grown more than 20% annually in the last five years and were expected to reach 4.3 billion globally by end 2017. Despite the high growth rates in developing countries and in LDCs, there are twice as many mobile-broadband subscriptions per 100 inhabitants in developed countries as in developing countries, and four times as many in developed countries as in LDCs (ITU 2017).

Only 15% of households in LDCs have Internet access at home. In these countries, many Internet users are accessing the Internet from work, schools and universities or from other shared public connections outside the home. Majority of those having access to internet are in the cities. International Internet bandwidth grew worldwide by 32% between 2015 and 2016. Africa experienced an increase of 72% during this period, the highest of all regions.[42]

---

[40] Aal (2015).

[41] Guerriero (2015).

[42] ITU (2017).

11.8 Conclusion

The chapter's introduction and conceptualization section points out clearly that ICT is a useful tool for facilitating attainment of peace and security in Africa as has been demonstrated in the literature and case studies, however use of ICT should not ignore the potential harm associated with the misuse of information communication technologies and the implications this has for international security.

As noted by Sommers (2001) surviving in cities is a hustle for many African youth with reference to Sect. 11.6 on African cities and smart application to peace and security attainment. Many are neither fully employed nor entirely unemployed. Much of what they do to make ends meet may be illegal. This may be particularly true for those affected by war. They are likely to engage in criminal work, which may range from simple thieving and vandalism to outright gang violence. Particularly compelling postwar examples of truly threatening urban gangs are the notorious Ninja that terrorize residents of Maputo, the capital of Mozambique.[43] This may require what IEP (2017b) term as need for investment in *youth development* policies which will require African governments to increase their budget funding for education and thereby improving the *High* Levels of Human Capital Pillar but go beyond this by absorbing them in various engaging employment programs. This will raise the Youth Development Index (YDI) which measures the status of 15–29 year-olds in according to five key Pillars: Education, Health and Well-being, Employment, Civic Participation and Political Participation. This is considered as key indicator in measuring Global Peace Index. This approach will be useful, since ITU (2017) facts and figures indicate that 70% of World's youth are online-referring to proportion of youth (15–24) years old using the internet. This means that solutions requiring adoption and usage of smart technology will be driven by youth, hence their importance in engaging them actively in programs aiming at attaining peace and security in Africa continent.

ICT has launched a revolution which can be both used and misused in creating or disturbing peaceful and secure environment due to its ability to transfer real time information to a mass of people rapidly.

In response to studies sole objective of mapping out Africa's peace and security landscape and digital platform, it is evident that ICTs have also been used in conflict situations to enable communication between citizens to warn each other and inform communities where violence is occurring. Existing social media like Twitter, Facebook, and blogging have been used to help share information about ongoing conflicts.

ICTs have given a new meaning to human rights, in particular the freedom of expression and information. They have allowed the creation of better communication and coordination mechanisms, the establishment of early warning systems as well as the development of other tools in the service of the humanitarian, human rights and peace communities.[44] This is clearly evident in African cities and urban areas

[43] Sommers (2001).

[44] United Nations ICT Task Force (2005).

where the youth and growing urban middle class have fully embraced social media in security alerts and exchanging of niceties.

The chapter recommends that as the continent citizens make use of ICTs, there is an urgent need to invest in peacebuilding in Africa as ICT will play a fundamental role in enhancing attainment of peace and security in Africa. IEP (2017a) estimates that the return on investment on peacebuilding funding can be up to 16 times the cost of the intervention, highlighting a major opportunity for future investment. This coupled with impressive statistics on internet penetration in urban areas in Africa, ICT has great potential of supporting peacebuilding in Africa cities.

In order to fully exploit the potential of smart technology in attainment of peace and security in African cities, ICT will have to be designed and developed in both the physical and the virtual worlds with 'Peacetech in mind'. Peace and security cannot be attained solely with traditional African government gun-power. It will require political goodwill and leadership, greater international cooperation and application of ICT in promotion of peace especially among the youth who seem to play major role as perpetrators and ambassadors nearly in all forms of known African continent conflicts.

References

AAAS Geospatial Technologies and Human Rights. http://shr.aaas.org/geotech/.

Aal, P. (2015). *Conflict in Africa: Diagnosis and response*. Waterloo, Canada: Centre for International Governance Innovation (CIGI).

Adjai, C., & Lazaridis, G. (2013). Migration, xenophobia, and new racism in post-apartheid South Africa. *International Journal of Social Sciences Studies, 1*(1).

African Union (AU). (2015). Agenda 2063: The Africa We Want. First Ten Year Implementation Plan (2013–2023).

De Benitez, S., Fawcett, C., Fujimora, C., Miller, S., Sommers, M., & Yousef, T. (2003). *Youth explosion in developing world cities: Approaches to reducing poverty and conflict in urban age*. Washington, D.C.: Woodrow Wilson International Centre for Scholars.

Department for International Development (DFID). (2001). The Causes of Conflict in Africa. Consultation Document.

Dorn, W. A. (2011). *Keep watching: Monitoring technology and innovation in UN peace operations*. Tokyo: United Nations University Press.

Dorn, W. A. (2016). *Smart peacekeeping: Toward tech-enabled UN operations*. Providing for peacekeeping no. 13. Washington: International Peace Institute.

Farrah, R., de Boer, J., & Muggah, R. (2017). *Digitally-enabled peace and security: Reflections for the youth, peace and security agenda*. https://www.youth4peace.info/system/files/2018-04/2.%20TP_Social%20Media_SecDev.pdf.

Guerriero, M. (2015). *The impact of internet connectivity on economic development in Sub-Saharan Africa*. UK: EPS PEAKS.

http://www.un.org/esa/socdev/rwss/docs/2001/15%20Armed%20Conflict.pdf.

Independent Commission on Multilateralism (ICM). (2016). The Impact of New Technologies on Peace, Security and Development.

Institute for Economics & Peace. (2017a). *New methods to assess risk of conflict and violence*. Sydney, September 2017. Risk report (Report Number 52). Available from: http://visionofhumanity.org/reports. Accessed January 18, 2018.

Institute for Economics and Peace (IEP). (2017b). *Global peace index 2017: Measuring peace in a complex world*. http://visionofhumanity.org/app/uploads/2017/06/GPI17-Report.pdf. Accessed January 18, 2018.

Institute for Economics and Peace (IEP). (2017c). *Global terrorism index 2017. Measuring and understanding the impact of terrorism.* Accessed January 18, 2018.

ITU. (2017). ICT Facts and Figures 2017.

Kahl, A. (2014). *Games and apps that build peace*, 7 October. Available at: http://www.undp.org/content/undp/en/home/blog/2014/10/7/building-peace-with-new-technologies-peaceappcompetition-now-accepting-submissions/.

Lehdonvirta, V., & Bright, J. (2015). Crowdsourcing for public policy and government. *Policy and Internet, 7*(3), 263–267.

Mac Ginty, R. (2010). Hybrid peace: The interaction between top-down and bottom-up peace. *Security Dialogue, 41*(4), 391–412.

McCandless, E., & Bangura, K. (2007). In M. King & E. Sall (Eds.), *Peace research for Africa: Critical essays on methodology* (pp. 47–52). UPEACE Africa Programme 2007, Addis Ababa.

Muraya, K. (2014). *Armed conflict and international peace keeping: How crime and insecurity is fueling proliferation of small arms and light weapons in Kenya*. Kenya: Department of Peace and Conflict Studies, Africa Nazarene University.

Obi, C. (2005). *Environmental movements in Sub-Saharan Africa: A political ecology of power and conflict*. Civil Society and Social Movements Programme Paper No. 15, January 3, 2005. Geneva: United Nations Research Institute for Social Development.

Oduaran, A., & Nenty, H. (2008). *Learning to live together in Sub-Saharan Africa. Linking cultural diversity, conflict prevention and resolution practices*. ISBN 978-1-60586-445-8. http://unesdoc.unesco.org/images/0016/001636/163622e.pdf.

Olaosebikan, J. (2010). Conflicts in Africa: Meaning, causes, impacts and solution. *African Research Review. International Multi-Disciplinary Journal, Ethiopia*, *4*(4). Serial No. 17, October 2010. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.729.7184&rep=rep1&type=pdf.

Richmond, O. P. (2012). Missing links: Peace infrastructure and peace formation. In: B. Unger, S. Lundström, K. Planta, et al. (Eds.), *Peace infrastructures—Assessing concept and practice*. *Berghof Handbook Dialogue Series* (pp. 22–29). Berlin: Berghof Foundation.

Richmond, O. P., & Tellidis, I. (2012). The complex relationship between peacebuilding and terrorism approaches: Towards post-terrorism and a post-liberal peace? *Terrorism and Political Violence, 24*(1), 120–143.

Sabadello, M. (2010). Potential of ICTs for peace.

Search for Common Ground (SFCG). (Undated). *Communication for peacebuilding: Practices, trends and challenges*. Supported by United States Institute of Peace (USIP). http://cu-csds.org/wp-content/uploads/2009/10/usip2011vdk.pdf.

Shoemaker, E., & Stremlau, N. (2014). Media and conflict: An assessment of the evidence. *Progress in Development Studies, 14,* 181–195.

Siyakhona, D. (2011). Citizen journalism inspires change in SA's townships. *Supernews*, 30 May. Available at: http://www.supernews.co.za/citizen-journalism-inspires-change-in-sas-townships/.

Sommers, M. (2001). Young, male and pentecostal: Urban refugees in Dar es Salaam, Tanzania. *Journal of Refugee Studies, 14*(4), 347–370.

Staffacher, D., Weekes, B., Gasser, U., Maclay, C. & Best, M. (2011). *Peacebuilding in the information Age: Sifting hype from reality*. ICT4Peace Foundation, January 2011. www.ict4peace.org.

Stockholm International Peace Research Institute (SIPRI). (2011). *SIPRI yearbook 2011: Armaments, disarmament and international security*. https://www.sipri.org/sites/default/files/2016-03/SIPRIYB11summary.pdf.

Tellidis, I., & Kappler, S. (2016). Information and communication technologies in peacebuilding: Implications, opportunities& challenges. *Cooperation and Conflict, 51*(1), 75–93. http://journals.sagepub.com/doi/pdf/10.1177/0010836715603752.

UNDP. (2013). *From connectivity to service delivery: Case studies in e-governance*. 20 March. Available at: http://www.undp.org/content/undp/en/home/librarypage/democratic-governance/access_to_informationande-governance/from-connectivity-to-service-delivery—casestudies-in-e-govern/.

UNHCR. (2016). Global Trends. Forced displacement in 2015.

United Nations. (2017). *The sustainable development goals report 2017*. New York.

United Nations ICT Task Force. (2005). *Information & communication technology for peace: The role of ICT in Preventing, responding to and recovering from conflict*. http://www.iapad.org/wp-content/uploads/2016/01/Stauffacher.pdf.

Welch, J. R., Halford, S., & Weal, M. (2015). Conceptualising the web for post-conflict governance building. *Peacebuilding, 3*(1), 58–74. https://doi.org/10.1080/21647259.2014.973673.

Young, O., & Young, E., (2016). *Technology for peacebuilding in divided societies: ICTs and peacebuilding in Northern Ireland*. UK: Transformative Connections.

Romanus Opiyo is a lecturer at the Department of Urban and Regional Planning (DURP) and coordinator of research with Centre for Urban Research and Innovations (CURI), University of Nairobi (UoN), Kenya. He is a holder of Ph.D. and Masters in Urban and Regional Planning (UoN) and BA degree in Social Sciences from Catholic University of Eastern Africa (CUEA). Romanus has twelve (12) years University teaching and research supervision experience and more than fifteen (15) years in research work. His research interests are on urban security, transportation and general land use planning, climate change and institutional governance and livelihoods. He has published widely, presented in local (Kenya) and international conferences and has contributed to urban policy development in Kenya. He has previously contributed in the publication of three editions of Smart cities namely; Smart Economy in Smart Cities, E-Democracy for Smart Cities and recently in Smart Metropolitan Regional Development: Economic and Spatial Design Strategies.

Dr. Opiyo is a member of the Environmental Institute of Kenya (EIK). He is also a member of the Kenya Civil Society Network for NMT and Road Safety (CIVNET) and a Member of Kenya Transport Research Network.