STUDY ON ARMED UNMANNED AERIAL VEHICLES

Prepared on the Recommendation of the Advisory Board on Disarmament Matters



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United Nations

Note

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Foreword

United Nations and other multilateral disarmament bodies have been seized for some time of the concern that unmanned aerial vehicles (UAVs) might be used as a means to deliver weapons of mass destruction. However, in recent years, there has been growing interest within the international community to address issues posed by the increasing use of UAVs to conduct targeted strikes, especially in areas outside active hostilities.

United Nations disarmament bodies are well suited to consider these matters, as they have long been concerned with the regulation of technologies that challenge humanitarian principles or whose widespread proliferation and use raise implications for international peace and security. I therefore welcomed the recommendation by the Secretary-General's Advisory Board on Disarmament Matters to commission a study on UAVs.

The Secretary-General's position on armed UAVs has been clear: they must only be used in accordance with international humanitarian law and international human rights law. It remains imperative for the international community to reach consensus on the interpretation of established international principles and their application to the use of armed UAVs.

At the same time, it must be acknowledged that UAVs have unique characteristics that make them particularly susceptible to misuse in comparison to other technologies. These include their low costs, which can aid their rapid proliferation; their small size and precision, which can tempt covert armed forces and non-State actors to use them secretly and without appropriate transparency, oversight and accountability; and the minimal risk to their operators, which can lower political thresholds for the use of force.

I support increasing transparency, oversight and accountability in the development, acquisition, stockpiling, transfer and use of armed UAVs as a confidence-building measure. This study surveys a number of possible ways in which this can be accomplished. I also support the pursuit of further research on the implications to international peace,

security and stability posed by armed UAVs as well as on their impact on civilians.

I hope this study serves as a point of departure for further multilateral engagement on these matters.

I commend this study to all States for their attention.

Kim Won-soo Under-Secretary-General Acting High Representative for Disarmament Affairs September 2015

Summary

This study has been prepared by the United Nations Office for Disarmament Affairs pursuant to the recommendation of the Secretary-General's Advisory Board on Disarmament Matters (A/69/208) with assistance by the United Nations Institute for Disarmament Research and the Human Rights Institute at the Columbia University School of Law.

Unmanned aerial vehicles (UAVs) for civil and military use, including those used to conduct armed strikes, can be distinguished and categorized based on physical characteristics such as maximum take-off weight, range, payload, endurance and means of command and control. Civil demand remains limited generally to small UAVs with a maximum take-off weight of less than 150 kg. Armed forces operate UAVs of all weight classes. Most armed UAVs are large systems with a maximum take-off weight in excess of 600 kg. There are examples, however, of armed medium-weight UAVs capable of carrying existing types of air-to-surface rockets. Furthermore, smaller systems are capable of employing weapons, either by design or adaptation, and being flown beyond the visual line-of-sight of the operator. A further relevant advent is the increasing development, production and export of remotely piloted loitering munitions or cruise missiles. Accordingly, thresholds found in existing multilateral export control regimes, which were once sufficient to act as a brake on the widespread proliferation of all types of armed UAVs, not just those capable of delivering weapons of mass destruction, have become less effective in regulating the spread of armed UAVs per se.

In the context of lethal targeting, the law governing the right to resort to force against another State must be distinguished from the law governing the use of force against individuals. These legal frameworks apply in parallel.

The United Nations Charter prohibits the "threat or use of force against the territorial integrity or political independence of any state". Where a State has not given its consent to the use of force on its territory, there are two exceptions to the prohibition: Security Council action pursuant to Chapter VII or in a State's self-defence. Self-defence arises when an armed attack against a State requires a

forcible response to remove the grave and persisting danger that the attack poses. Any resort to force in self-defence must comply with the conditions of necessity and proportionality, and any force used to prevent an "imminent" attack must be in response to an attack that is instant, overwhelming, and leaving no choice of means.

Under international human rights law, the taking of life is only lawful where strictly necessary to protect against an imminent threat to life. Any use of force must meet the principles of necessity. proportionality and precaution. International humanitarian law, which applies only in armed conflict, requires that parties distinguish between civilian persons and civilian objects on the one hand, and combatants and military objectives on the other, and that they direct their operations only against combatants and military objectives. Civilians are entitled to protection against direct attack unless and for such time as they directly participate in hostilities. While civilian persons and objects may be incidentally harmed in an attack, the rule of proportionality dictates that "incidental loss" of civilian life or property must not be excessive in relation to the concrete and direct military advantage anticipated from an attack against a military objective. Parties to an armed conflict must also take "feasible" precautions in carrying out attacks in order to avoid and minimize incidental loss of civilian life, injury to civilians and damage to civilian objects.

While the use of armed UAVs may offer a number of advantages, including enhancing the potential to comply with international law, they have also elicited some unease about a weakening of the standard for deploying force and raised new challenges in the application and interpretation of international law. States' lack of transparency on their operations, the applicable legal frameworks or their criteria for selecting targets adds to the concern. A strict application and protective interpretation of the relevant legal frameworks may alleviate some common concerns about their use in lethal targeting, but this can only be complementary to the important ethical, moral and political debates that must accompany the development and use of such weapon systems.

Due to their unique characteristics, armed UAVs raise particular implications for the maintenance of international peace, security and

stability, as well as the integrity of international humanitarian and human rights principles. They can alter incentives for the use of force by lowering the risk to one's own armed forces and civilian population or by enabling new types of low-intensity conflict. Their capabilities enable armed forces to pursue new types of missions, tempting States to interpret international humanitarian and human rights law in ways that permit expanded use of force. They are attractive to covert armed forces that operate in ways that may not permit sufficient transparency and accountability. They could become increasingly available to non-State actors, providing them with inexpensive options to conduct attacks with increasing control and precision. They can drive the development of increasing autonomy in weapon systems, reducing decision times for strikes and thereby diminishing human control over the use of force. It should also be acknowledged that in some circumstances, the use of armed UAVs can facilitate greater adherence to humanitarian principles.

States and civil society seek increased transparency, oversight and accountability for the use of armed UAVs outside areas of active hostilities for various reasons, including to increase confidence in adherence to international law; reduce the potential for unlawful acts through the promotion of norms and common standards for behaviour; protect civilians; promote international peace and security; promote the democratic legitimacy of counter-terrorism operations; assist in the investigation of human rights violations; and facilitate implementation of export controls.

International human rights law requires an investigation whenever death, serious injury or other grave consequences result from the use of force. Accountability depends on public access to the relevant information and victims have a right to access information relating to allegations of violations and their investigation. States also have a duty to investigate serious international humanitarian law violations over which they have jurisdiction. If appropriate, States must prosecute the suspects. Investigations should strive to meet standards of independence, impartiality, effectiveness, promptness, thoroughness and transparency.

The development of transparency and confidence-building measures can be effective in addressing issues posed by armed

UAVs. The implementation of mechanisms to increase transparency, oversight and accountability can be pursued through unilateral, bilateral, plurilateral or multilateral measures and can include disclosure of information to various recipients including the public. The protection of sensitive operational information and intelligence sources is an important consideration in this regard. While there remains an urgent need for States to establish common definitions and interpretations of key legal principles, it remains possible to develop effective transparency and confidence-building measures and to increase accountability and oversight even in the absence of such shared understanding.

Possible information that States could provide with respect to the use of UAVs to conduct targeted strikes outside areas of active hostilities include the following: information regarding the legal framework, national laws and policies that a State applies to specific situations in which an armed unmanned aerial vehicle may be used; information regarding processes for accountability and investigations into allegations of violations to the right to life and credible allegations of war crimes; information regarding the legal basis for each use of force; operational information on each targeted strike, including its location, the targeting criteria, the weapon system used and on civilian casualties; and the results of investigations or factfinding assessments.

A mechanism for increasing transparency and confidencebuilding on armed UAVs could also provide for the sharing of information related to the development, acquisition, stockpiling and transfer of armed UAVs, building upon existing international legal obligations and voluntary United Nations mechanisms. Possible measures include the following: publication of national reviews under article 36 of Additional Protocol I to the 1949 Geneva Conventions; provision of data on imports, exports and holdings to the United Nations Register of Conventional Arms and publication of annual reports pursuant to article 13 (3) of the Arms Trade Treaty, if such information has not been submitted to the United Nations Register; agreed procedures to enable States to cooperate in order to prevent, investigate or mitigate any diversion of armed UAVs, in accordance with article 11 of the Arms Trade Treaty; and establishment of common requirements for end-user certificates that could be applied to any exports of armed UAVs providing assurances on the use of the system.

The widespread acceptance of transparency and confidencebuilding measures on armed UAVs would benefit from their development within a multilateral framework, and with meaningful engagement by civil society. In the near-term, multilateral engagement on this matter could be best facilitated through a study conducted under the auspices of the United Nations Institute for Disarmament Research with the assistance of a geographically representative group of qualified experts.

Introduction

1. From its fifty-ninth to sixty-second sessions (2013-2014), the Secretary-General's Advisory Board on Disarmament Matters discussed the issue of unmanned aerial vehicles (UAVs) as part of its consideration of its agenda item entitled "Disarmament and security implications of emerging technologies".¹ In 2014, at the end of sixty-first and sixty-second sessions, the Advisory Board recommended with respect to UAVs that:

The Secretary-General should commission study а to examine the distinction between armed/military drones and unarmed/peaceful/civilian drones, and such ideas as improving transparency in targeted unmanned aerial vehicle strikes as a confidence-building measure and developing a robust oversight and accountability mechanisms for targeted strikes outside active battlefields. The proposed study should also consider international humanitarian law and how relevant principles such as distinction, proportionality and military necessity should be applied, with a view to avoiding excessive injurious or indiscriminate effects.

The Secretary-General should consider including in the above-mentioned study a broader range of emerging technologies that might have an impact on international security and the arms control process, including in the field of outer space.

2. As announced by the Chair of the Advisory Board, István Gyarmati (Hungary), at the 9th meeting of the sixth-ninth session of the Disarmament and International Security Committee (First Committee) of the General Assembly, the Secretary-General agreed with the recommendation and commissioned the United Nations Office for Disarmament Affairs (UNODA) to produce the study. The present study has been prepared within existing resources and with research and analysis by the United Nations Institute for Disarmament

¹ See the reports of the Secretary-General on the work of the Advisory Board on Disarmament Matters (A/68/206 and A/69/208).

Research and the Human Rights Institute at the Columbia University School of Law, which served as consultants.

3. To facilitate the development of the aspects of the study that address improving transparency, oversight and accountability in the use of UAVs to conduct targeted strikes outside areas of active hostilities, UNODA and the United Nations Institute for Disarmament Research co-organized an "International seminar on improving transparency, oversight and accountability for any use of armed unmanned aerial vehicles outside areas of active hostilities", held in Geneva on 15 and 16 June 2015. The seminar was made possible by the financial support provided by Germany, Switzerland and the Open Society Foundations.

4. UNODA expresses its gratitude to the individuals who provided contributions and research to the study, John Borrie, Amy Dowler, Sarah Knuckey, Michael Spies and Nathalie Weizmann. Sincere appreciation also goes to the individuals who provided research assistance for the preparation of the study, Elena Finckh and Sanne Verschuren, as well as to those who provided invaluable comments and support, Chris King and Kerstin Vignard.

Chapter I Distinctions between civilian and military unmanned aerial vehicles

1. The increasing development and acquisition of armed unmanned aerial vehicles (UAVs), and the widely documented impact that their use has had on civilian populations,¹ has driven greater interest in understanding the implications posed by this technology for international peace and security, as well as for humanitarian and human rights concerns. This has resulted in new demands for developing mechanisms to increase transparency and accountability with respect to their proliferation and use. As a foundation for the discussion in subsequent chapters on substantive issues relating to armed UAVs, this chapter examines the distinctions between unarmed military, armed military and civil UAVs.

2. In this study, the term "unmanned aerial vehicle" is synonymous with "unmanned aircraft", and can be defined as an aircraft that is intended to operate with no pilot on board.² The term "unmanned aerial system" refers to a UAV and its associated support and logistical elements. The term "remotely piloted aircraft" refers to the subset of UAVs that are controlled by a pilot who is not on board the vehicle, in contrast to an "autonomous aircraft", which refers to unmanned aircraft that do not allow pilot intervention in the management of its flight. It should be noted, however, that a number of remotely piloted

¹ See, e.g., Columbia Law School Human Rights Clinic and the Center for Civilians in Conflict, "The Civilian Impact of Drones: Unexamined Costs, Unanswered Questions", 2012 (http://web.law.columbia.edu/sites/default/files/microsites/humanrights-institute/files/The%20Civilian%20Impact%20of%20Drones.pdf); Amrit Singh, "Death by Drone: Civilian Harm Caused by U.S. Targeted Killings in Yemen", Open Society Foundations, April 2015 (http://www.opensocietyfoundations.org/ sites/default/files/death-drones-report-eng-20150413.pdf); and Open Society Foundations, "After the Dead Are Counted: U.S. and Pakistani Responsibilities to Victims of Drone Strikes", November 2014 (http://www.opensocietyfoundations. org/sites/default/files/after-dead-are-counted-20141120.pdf).

² There are no formal and internationally recognized definitions for the terms discussed in this paragraph. General reference is made to the 2011 information circular by the International Civil Aviation Organization, Cir 328-AN/190, on Unmanned Aircraft Systems (UAS), which includes an informal glossary of terms.

aircraft can fly autonomously without pilot intervention for managing portions of their flight. While this study uses the more general term UAV, it is concerned exclusively with remotely piloted aircraft. Although remotely piloted and autonomous aircraft may pose many similar challenges, the latter are not taken up in this study because the matter of autonomous weapon systems³ is a distinct issue that merits separate consideration.

There are a number of reasons why UAVs should be addressed 3. as a distinct category of weapon system for the purpose of arms control. As elaborated below and in subsequent chapters, UAVs have a number of unique characteristics that give them greater potential to be misused. These characteristics-such as, inter alia, their low cost, relatively small size and portability, as well as the perceptions of reduced risk of harm to operators, potentially lowering political risks associated with decisions to use force while simultaneously expanding the geographical scope of armed conflicts-include factors that make these systems more attractive to covert special forces, intelligence agencies and non-State actors than manned combat aircraft. Taken together, these factors mean that armed UAVs not only pose challenges to ensuring that States and armed groups comply with international law, but also raise unique implications for the maintenance of international peace and security.

4. In light of the inherent dual-use nature of UAVs, which have numerous civil, commercial and military applications, the development of reliable means of distinguishing between various classes of UAVs and their functions is essential for meaningful arms control.⁴ The absence of any internationally agreed system for classifying UAVs further complicates this task, although in practice various national classification systems overlap to a degree sufficient to describe the relationship between various classes of UAVs and their military or civil functions.

³ This can be defined as a weapon system in which a human does not operate the critical functions of selecting and attacking a target.

⁴ Analysis in this section draws upon data obtained from open sources on a nonexhaustive list of more than 550 types and variants of civil and military UAVs in operation or under development in more than 50 States.

5. Definitions in multilaterally developed export control lists and guidelines are of decreasing relevance in serving as a basis for distinguishing between military and civilian UAVs, due in particular to advances in technology. Many basic characteristics of UAVs used in these guidelines and lists, such as weight, range, payload and endurance, are becoming less relevant, as militaries now operate UAVs across a wide spectrum of these characteristics and ever smaller systems are capable of employing weapons, including beyond the visual line-of-sight of the operator. These trends point to the need for continued innovation in arms control approaches, which have increasingly fallen behind the development of UAVs and related technologies.

I. Classification and functions

6. Governments and international organizations make use of various systems for classifying and categorizing UAVs. These classifications are generally based on a number of basic characteristics, particularly weight, endurance and operating range. Various categories of UAVs also correlate generally with other characteristics, such as normal/ maximum operating altitude, command and control capability, wing-type and typical uses or functions. The great diversity in the types and capabilities of all types of UAVs works against the establishment of all-encompassing classification systems.⁵ Civilian and military authorities tend to structure their classification of drones based on maximum gross take-off weight and typical/maximum cruising altitude. While many national classification systems employ similar terms and basic approaches, definitions and the delineations between categories can vary.

7. Small UAVs are typically defined as systems with a maximum take-off weight of up to 150 kg. They are normally flown within the visual line-of-sight⁶ of the operator up to a maximum altitude of

⁵ Consider the United Kingdom Ministry of Defence Joint Doctrine Note 2/11, "The UK Approach to Unmanned Aircraft Systems", 30 March 2011, which describes a small (30 kg) UAV capable of transatlantic flight. Available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33711/20110505JDN_211_UAS_v2U.pdf.

⁶ Commonly abbreviated as VLOS.

500 feet above the ground. The development of UAVs of this weight class are experiencing the fastest commercial growth because of their low cost, ease of use and less complicated integration into national airspace. There is already an active market for civil/small UAVs for visual line-of-sight operations, although there is growing demand and interest in more advanced small UAVs capable of operating beyond visual line-of-sight,⁷ including for the purpose of routine commercial cargo and delivery flights. Although cut-off weights vary between national classification systems, small UAVs can be subcategorized as follows:

a. Miniature UAVs are smaller than 10 kg and generally can be launched manually by a human. Some classification systems consider "mini" to extend up to 20 kg, a size at which catapults or some other form of assistance, such as rockets, a launch tube or use of a runway, become necessary for the launch of fixed-wing systems. Most UAVs used by militaries in target acquisition roles are small systems that fall within this subcategory and can be hand-launched.

b. Miniature systems, which, in military roles, can be sophisticated enough to require a crew of two or more individuals to operate, are often further distinguished from "micro" UAVs, which are generally smaller than 2 kg and can be hand-launched and operated by a single person. There are fewer examples of UAVs in this smallest tier, although it includes models designed for military use in intelligence, surveillance and reconnaissance (ISR) roles as well as for civil, commercial and recreational use.

8. Medium UAVs are typically defined as systems with a maximum take-off weight between 150 kg and 600 kg. Most systems in this weight class are operated only by militaries, mainly for use in ISR roles. They are typically operated below 18,000 feet above sea level, have a range of less than 800 km and an endurance of only a few hours. Payloads for these systems are generally below 100 kg, although larger systems in this tier, such as the Hermes 450 (Elbit Systems), can carry a payload in excess of 200 kg and thus can be adapted to employ existing types of air-to-surface rockets or other arms. These systems generally operate beyond the visual line-of-sight of the operator, who controls the system from a ground station. It

⁷ Commonly abbreviated as BVLOS.

should be noted, however, that most examples of systems in this tier are limited to radio line-of-sight⁸ operations.

9. Large UAVs are typically defined as systems with a maximum take-off weight above 600 kg. Existing systems in this weight class are currently in operation only by armed forces, where they are generally used in highly specialized missions, including long-term ISR and targeted strikes. This category includes the most complex systems, requiring a large logistical footprint similar to manned aircraft and a runway for take-off and landing. In comparison to other tiers, many large UAVs can operate at long ranges, beyond radio line-of-sight,⁹ via the use of satellites and/or other forms of data links, such as ground-, sea- or air-based relays and mobile telephone networks.¹⁰

a. Altitude and endurance are commonly used to differentiate between categories of large systems. Although already obsolete in some classification systems,¹¹ the category of medium altitude long endurance (MALE) UAVs is still frequently used, referring to systems that normally fly up to 45,000 feet above sea level and have an endurance of more than several hours. Most known armed UAVs currently in operation and under development fall into this subcategory and include systems such as the ASN-209 (Xian Aisheng), the MQ-1 Predator (General Atomics), the MQ-5 Hunter (Northrup Grumman), the MQ-9 Reaper (General Atomics) and the Hermes 900 (Elbit Systems).

b. High altitude long endurance (HALE) UAVs refer to systems that can fly up to 65,000 feet. Systems of this class currently in operation are used for ISR missions, carry large and sophisticated sensor payloads, and include systems such as the RQ-4 Global Hawk (Northrup Grumman) and the BZK-009 (Guizhou Aviation). These are

⁸ Commonly abbreviated RLOS, the range of such systems is normally limited to about 200-250 km.

⁹ Commonly abbreviated BRLOS, the range of such systems are limited only by its speed and endurance.

¹⁰ These data links may include use of both dedicated military and commercial communication services.

¹¹ See North Atlantic Treaty Organization Joint Air Power Competence Centre, "Strategic Concept of Employment for Unmanned Aircraft Systems in NATO", 2010.

among the largest UAVs currently in operation and are designed to fly at altitudes above those of typical commercial aircraft.

c. Existing MALE UAVs are used for tactical and battlefield support operations. Due to their unique characteristics, they perform missions that might not normally be assigned to manned aircraft. In comparison to manned aircraft, these systems are slower, often loiter for hours above potential targets and lack the means to counter sophisticated air defences or to operate in contested airspace.

d. Several countries are, however, planning or developing long-range strike UAVs that could incorporate stealth technology and fly at supersonic speeds, thereby enabling them to fulfil roles currently performed by manned combat aircraft and strategic bombers, including the employment of nuclear weapons. Current planned and experimental systems of this type include the X-47B (Northrop Grumman), the Neuron (Dassault) and the proposed Long-Range Strike Bomber.¹²

II. Multilaterally developed definitions and other means of classification

10. Existing multilaterally developed definitions variously consider a limited number of characteristics, including whether a system has been designed, equipped or modified to carry weapons, its maximum range, its maximum payload, its endurance and maximum wind speed limitation. The purpose of these older definitions was to facilitate efforts to restrict the proliferation of UAVs capable of delivering weapons of mass destruction, particularly nuclear weapons. Such definitions are now of limited use in distinguishing between military and civilian UAVs or, in the case of the guidelines of the Missile Technology Control Regime, even between armed and unarmed military UAVs.

¹² Press reports continue to refer to the prospect that this strategic bomber could be optionally manned. See Aaron Mehta, "Shrouded in Mystery, New Bomber Makes Waves", *Defense News*, 19 January 2015. Available from http://www.defensenews. com/story/defense/air-space/strike/2015/01/18/air-force-bomber-industry/21805275/.

United Nations Register of Conventional Arms

11. The 2013 Group of Governmental Experts on the continuing operation of the United Nations Register of Conventional Arms and its further development recommended that Member States include armed UAVs in their national reports on transfers of conventional arms.¹³ While such systems were already covered by the Register, the Group proposed definitions for both unmanned combat aircraft¹⁴ and unmanned attack helicopters¹⁵ to stimulate reporting by Member States on the transfers of these weapons.¹⁶ In accordance with the terms of the Arms Trade Treaty, those definitions for UAVs are also included in the scope of the Treaty.¹⁷

12. While these descriptions are useful in enabling States to distinguish between armed and unarmed military UAVs in their national reports, they do not apply to transfers of unarmed variants of military UAVs that are used, in other variants, for strike missions,¹⁸ or other UAVs capable of being adapted or modified to employ weapons. Hence, reports pursuant to the United Nations Register or to the Arms Trade Treaty¹⁹ will provide only an increasingly partial snapshot of global UAV capabilities as more countries acquire strike-capable MALE UAVs exported as ISR platforms.

¹³ A/68/140, para. 69.

¹⁴ For unmanned combat aircraft, the Group recommended unmanned fixed-wing or variable-geometry wing aircraft, designed, equipped or modified to engage targets by employing guided missiles, unguided rockets, bombs, guns, cannons or other weapons of destruction. See A/68/140, para. 45.

¹⁵ For unmanned attack helicopter, the Group recommended unmanned rotarywing aircraft, designed, equipped or modified to engage targets by employing guided or unguided anti-armour, air-to-surface, air-to-subsurface, or air-to-air weapons and equipped with an integrated fire control and aiming system for these weapons. See A/68/140, para. 46.

¹⁶ A/61/261, paras. 96 and 97.

¹⁷ Article 5 (3).

¹⁸ See, e.g., David Ing, "Spain to buy four MALE UAVs", *Jane's Defence Weekly*, vol. 52, issue 38, 5 August 2015; Menno Steketee, "Netherlands to send crews to US for training on MQ-9 Reaper", *Jane's Defence Weekly*, vol. 52, issue 12, 4 February 2015.

¹⁹ See chapter 4.

Security Council resolution 1540 (2004)

13. In resolution 1540 (2004), the Security Council affirmed that the proliferation of, inter alia, unmanned systems capable of delivering nuclear, chemical or biological weapons and specially designed for such use constitutes a threat to international peace and security. In the context of the resolution, unmanned systems are an integral component of the definition for "means of delivery" of nuclear, chemical and biological weapons, together with missiles and rockets. Unmanned systems also form an integral part of the definition of "related materials", which includes materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included in national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.

14. The restrictions on UAVs contained in resolution 1540 (2004) are narrow as they apply only to unmanned systems *specifically designed* to be used as delivery platforms for nuclear, chemical and biological weapons. This restrictive definition may not be sufficient to guard against a non-State actor adapting a UAV designed for some other purpose for use to deliver weapons of mass destruction.

Missile Technology Control Regime

15. The purpose of the Missile Technology Control Regime (MTCR, 1987)²⁰ is to limit the proliferation of rockets and UAVs capable of delivering weapons of mass destruction. Under category I, the guidelines apply to complete UAVs, including cruise missile systems, target drones and reconnaissance drones, if they are capable of delivering at least a 500 kg payload to a range of at least 300 km. Other such systems, including cruise missile systems, target drones and reconnaissance drones, are listed under category II if they are capable of a range equal to or greater than 300 km; or if they incorporate an aerosol dispensing system/mechanism with a capacity

²⁰ The MTCR guidelines require its members to exercise particular restraint with respect to the transfer of all items listed in its annex, with a strong presumption to deny such transfers of items listed in category I. In addition, the transfer of production facilities for category I items is prohibited.

greater than 20 litres, or are designed or modified to incorporate such a dispensing system.²¹

16. For the purpose of distinguishing between military or civilian systems, or even between armed and unarmed systems, the MTCR thresholds appear increasingly irrelevant. As discussed above, existing armed UAVs fall on either side of the category I threshold. Further, in at least one instance a supplier has created an export variant of an armed UAV designed specifically to fall below the category I threshold.²²

Wassenaar Arrangement

17. The purpose of the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (1996) is to complement existing export control regimes aimed at preventing or constraining the proliferation of weapons of mass destruction and their means of delivery. With respect to UAVs, States participating in the Arrangement maintain national export controls via domestic legislation on such systems provided that they are designed to fly beyond visual line-of-sight and either have an endurance greater than one hour or can take off and maintain stable flight in wind gusts greater than 25 knots and have an endurance between 30 minutes and one hour. The Arrangement also applies to specific equipment and components related to UAVs, including any equipment and components designed to convert manned aircraft to a UAV covered by the Arrangement and engines capable of propelling a UAV above an altitude of 50,000 feet.

18. While the Wassenaar thresholds currently capture all armed UAVs, they are increasingly losing relevance as a means for distinguishing between civilian and military UAVs. Due in particular to advances in command and control technology, particularly the use of mobile phone data networks that enable UAVs to be operated beyond visual line-of-sight, small UAVs designed for civil and

²¹ This definition is not inclusive of model aircraft, specially designed for recreational or competition purposes.

²² Micah Zenko and Sarah Kreps, 2014, "Limiting Armed Drone Proliferation", *Council Special Report No. 69*, Council on Foreign Relations.

commercial use are increasingly falling within these thresholds.²³ At the same time, some small unarmed UAVs designed for military use also fall within these thresholds.²⁴

III. Distinguishing characteristics and technological trends

19. As described in the previous section, definitions and guidelines used in various multilateral export control regimes are of increasingly limited use in distinguishing between UAVs intended for civil use and UAVs capable of employing weapons. The section below discusses how various characteristics of UAVs could be used for this purpose, against the backdrop of the continuous technological advancements in the field that might complicate attempts to seek greater transparency or controls over the development, acquisition, transfer and use of UAVs.

Physical characteristics

20. Certain physical characteristics, such as weight and payload, continue to be useful to consider for some arms control purposes even though an increasing number of armed UAVs exported fall below the thresholds in multilaterally agreed export control lists and guidelines.

21. Weight continues to be a useful but non-exclusive means of distinguishing between military and civil UAVs. While examples of military UAVs can be found in all weight classes, the vast majority of civilian UAVs available on the market or under development are small systems with a maximum gross take-off weight of less than 150 kg. A number of manufacturers are developing much larger systems for civil use, which may, however, make weight a less definitive criterion in the future. For example, on 20 July 2015, the Spanish company Singular Aircraft conducted its maiden test flight of the amphibious Flyox I, which has a listed maximum take-off weight of 3,800 kg, including a maximum payload of 2,050 kg.²⁵

²³ Consider, for instance, the DT-18 and DT-26 (Delair-Tech) and the Marun (Oneseen Skytech).

²⁴ Consider the RQ-12 Wasp (AeroVironment).

²⁵ Singular Aircraft, Press Release, 20 July 2015. Available from http://singularaircraft.com/first-flight-of-the-flyox-i/. The Flyox is being

22. Most civil/small UAVs are not capable of carrying surface-toair rockets and small diameter bombs designed specifically for use by UAVs. Most of these weapon systems, such as the China Aerospace Science and Technology Corporation AR-1 and the Lockheed Martin AGM-114 Hellfire, have a total weight of approximately 45 kg.²⁶ It should be noted, however, that smaller missile systems have been developed for multirole UAVs, including those available for export, such as the 16-kg Tian Lei-2, which reportedly carries a 4-kg warhead.²⁷

23. Due to a number of factors, weight and payload are not useful for distinguishing between weapons-capable UAVs and other types unarmed military UAVs despite the relevance of these characteristics for some arms control purposes. First, some of the largest and most capable military UAVs, such as the RQ-4 Global Hawk (Northrup Grumman) and the Hermes 900 (Elbit Systems), are designed and used primarily for ISR missions and not in attack roles. Second, UAVs commonly used for armed strikes are marketed as multirole systems, such as the MQ-9 Reaper (General Atomics) and the ASN-209 (Xian Aisheng), and are frequently exported in non-armed variants, largely for ISR missions. Third, as discussed below, small UAVs are increasingly capable of carrying a lethal payload at long ranges beyond visual line-of-sight.

Command and control

24. Due to technological innovations, the ability to operate UAVs beyond line-of-sight is not useful as a distinguishing characteristic for differentiating between civil, unarmed military UAVs and armed military UAVs, especially as sophisticated command and control capabilities are not necessary for this purpose. Small UAVs for civil use are increasingly capable of being operated beyond radio lineof-sight via mobile telephone data networks. While the availability

marketed for commercial and civil applications including emergency response, surveillance, agricultural applications and cargo transport.

²⁶ Richard D. Fisher, Jr., "IDEX 2015: Blue Arrow 9 further expands Chinese UAV weapon options", *Jane's Defence Weekly*, vol. 52, issue 15, 25 February 2015.

²⁷ Kevin Wong, "US DoD annual report highlights China's growing UAV strike capabilities", *Jane's Defence Weekly*, vol. 52, issue 26, 13 May 2015.

of such networks may not be relevant for State armed forces,²⁸ this technological trend could have significant implications for the ability of non-State actors and relatively unsophisticated armed groups to adapt commercially available UAVs for use as long-range, remotely piloted munitions (see below). Further, there are a growing number of armed UAVs available for export that can operate via direct radio line-of-sight data links.²⁹

25. It is notable, however, that some of the most advanced military UAVs continue to be distinguished by their reliance on sophisticated means of command and control, including direct radio line-of-sight communication for launch, recovery and battlefield operations, as well as satellite and other relays for the cruise portions of flight. The operation of such systems entails a large logistical footprint with the possible widespread deployment of land-, sea- and air-based supporting infrastructure, including on the territory of third-party States.³⁰ Depending on the type of support³¹ provided by third-parties to UAV operations, this may raise issues of liability, transparency and accountability for those third-party States.³²

Loitering munitions

26. As a final observation, it is notable that certain remotely piloted vehicles have been designed to function as loitering munitions, hence blurring the line between UAVs and cruise missiles. Like cruise missiles, these systems are essentially flying bombs and carry weapons or warheads that are integrated into the airframe. Notably they are generally much lighter than UAVs designed to carry air-to-surface

²⁸ Possession of communications satellites is no longer necessary for State actors to operate UAVs beyond visual or radio line-of-sight, as advanced UAV manufacturing countries are able to offer communication services and bandwidth as part of their export packages.

²⁹ Kevin Wong, "US DoD annual report highlights China's growing UAV strike capabilities".

³⁰ United Kingdom Ministry of Defence Joint Doctrine Note 2/11, "The UK Approach to Unmanned Aircraft Systems", 30 March 2011. Available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/ 33711/20110505JDN_211_UAS_v2U.pdf.

³¹ This can include command and control data relay (flight operations), basing and transit, provision of intelligence, target acquisition, etc.

³² For instance, a State that is victim to a UAV strike may be entitled to exercise its right to self-defence against the third-party State.

rockets or bombs. Such systems in operation include the Harpy and Herun, both manufactured by Israel Aerospace Industries. Remotely piloted munitions, however, can be distinguished from cruise missiles, which are pre-programmed, fly along a pre-determined flight path and strike pre-determined targets.³³

27. This trend towards the widespread adoption of remotely piloted loitering munitions raises the spectre that virtually no weight-based threshold could capture all UAVs capable of functioning as a weapon system. Some small UAVs under development, such as the Cutlass (L3) and the Futura (Alcor Technologies), are marketed as being capable of functioning as expendable munitions. The former features a payload of approximately 1.4 kg, comparable to the amount of high explosives contained within a heavy mortar shell or the Tian Lei-2 airto-surface missile,³⁴ and the latter has a payload of 10 kg, comparable to the size of the warhead carried by the AGM-114 Hellfire and AR-1 missiles.³⁵ Small and expendable systems such as these may pose the greatest challenge for arms control, especially if they prove to be an attractive option for non-State armed groups.

IV. Conclusions

28. Due to a combination of factors, there are diminishing technological and regulatory barriers to the acquisition and use of armed UAVs by State and non-State actors, regardless of their level of sophistication. Thresholds found in existing multilateral export control regimes were once sufficient to act as a brake on the widespread proliferation of all types of armed UAVs (not just those

³³ The 2002 report by the United Nations Panel of Governmental Experts entitled "The issue of missiles in all its aspects" defined a cruise missile as "an unmanned, self-propelled weapon-delivery vehicle that sustains flight through the use of aerodynamic lift over most of its flight path" (A/57/229). The Group was primarily interested in distinguishing between ballistic and cruise missiles and hence noted that UAVs and cruise missiles "are sometimes indistinguishable" while observing that UAVs are intended to be used more than once.

³⁴ Kevin Wong, "US DoD annual report highlights China's growing UAV strike capabilities".

³⁵ Richard D. Fisher, Jr., "IDEX 2015: Blue Arrow 9 further expands Chinese UAV weapon options", *Jane's Defence Weekly*, vol. 52, issue 15, 25 February 2015.

capable of delivering weapons of mass destruction). These controls, however, have become less relevant as UAVs have been developed across all weight classes and increasingly smaller systems are capable of employing weapons, or being modified for this purpose, including beyond the visual line-of-sight of the operator.

29. While it remains useful to continue to focus on MALE UAVs, which generally function as multirole platforms most suited for targeted strikes, there is an increasing need to consider more than just whether a UAV has been specifically designed to employ weapons. In this connection, as civil demand remains largely centred on small UAVs, there could be particular benefit, at least in the near term, for future transparency and arms control efforts to focus on systems with a maximum take-off weight of greater than 150 kg. However, as UAV technology continues to advance and as smaller armed UAVs are developed, it would be beneficial to seek greater transparency in the development, production, acquisition, transfer and use of all types of military UAVs, regardless of their size.

Chapter II International law applicable to the use of armed unmanned aerial vehicles outside areas of "traditional battlefields"

1. Armed unmanned aerial vehicles (UAVs) have acquired a critical role in armed conflict and counter-terrorism operations and are used to carry out a range of missions, including "targeted killings". Their use, especially for targeted killings outside areas of "traditional battlefields", has led to significant scrutiny, including in relation to the relevant international legal framework and whether they are being used lawfully.

2. This section provides a brief overview of the relevant international legal framework. In the context of lethal targeting, *jus ad bellum* is the law governing the legality of the resort to force against another State. The use of force against individuals is governed by international human rights standards. During an armed conflict, the rules of international humanitarian law governing targeting are also relevant. The *jus ad bellum* regime does not displace either of the international human rights law (IHRL) or international humanitarian law (IHL) regimes. Instead, the legal frameworks apply in parallel.

I. Jus ad bellum

The prohibition of the use of force

3. The United Nations Charter prohibits the "threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations". The principal object of this prohibition is to protect State sovereignty,¹ or in other words the "right not to be subject to coercion by any other sovereign State".² The prohibition is universally accepted as a norm of customary international law.

¹ See General Assembly resolution 3314 (XXIX) of 14 December 1974. Available from http://daccess-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/739/16/IMG/ NR073916.pdf?OpenElement.

² O. Corten, *The Law Against War[:] The Prohibition on the Use of Force in Contemporary International Law*, Hart, 2010 at 169.

"Force" means armed force, and excludes political or economic 4. coercion. Armed force can take the form of incursions of military forces into another State's territory, or even cross-border shooting into foreign territory, regardless of whether armed confrontation results, and even if troops withdraw immediately.3 In addition, the prohibition includes *indirect* force,⁴ typically manifested by a State's participation in organized armed groups' or allied States' use of force on another State's territory, such as arming and training armed groups that actually use or threaten force against that State.⁵ Allowing one's territory to be used to commit acts of force against another State, for example by hosting UAVs' command and control infrastructure, could also conceivably constitute an indirect use of force.⁶ Nevertheless, the International Court of Justice (ICJ) has explained that not every act of assistance constitutes a use of force: "while the arming and training of the *contras* can certainly be said to involve the threat or use of force against Nicaragua, this is not necessarily so in respect of all the assistance given by the United States Government".⁷ It has been suggested that "non-lethal activities" such as "leadership training, organizational assistance, political or economic intelligence gathering, political subversion, or information operations" do not cross the use-of-force threshold, while the provision of "lethal ('military') training and logistical support, such as instruction on the use of weapons or transporting of rebel forces during operations, would, by contrast, be an unlawful use of force". The provision of targeting intelligence would appear to fall under the latter category.⁸ While the

³ United Nations Charter Commentary, Randelzhofer and Dorr, 2012 at 216. See also T. Ruys, "The Meaning of "Force" and the Boundaries of the *Jus Ad Bellum*", *American Journal of International Law*, vol. 108, no. 2 (April 2014), pp. 159-210.

⁴ See General Assembly resolution 2625 (XXV) (24 October 1970). Available from http://www.un-documents.net/a25r2625.htm.

⁵ Nicaragua [1986], ICJ Rep, para. 228. Available from http://www.icj-cij.org/ docket/files/70/6503.pdf.

⁶ United Nations Charter Commentary, Randelzhofer and Dorr, 2012 at 211; M. N. Schmitt and A. E. Wall, "The International Law of Unconventional Statecraft", *Harvard National Security Journal*, vol. 5, 2014 at 363. Available from http://harvardnsj.org/wp-content/uploads/2014/01/Schmitt-Wall-International-Law-of-Unconventional-Statecraft.pdf.

⁷ Nicaragua [1986], ICJ Rep, para. 228.

⁸ M. N. Schmitt and A. E. Wall, "The International Law of Unconventional Statecraft", at 375 (fig. 2).

prohibition also covers *threats* of force, these have rarely led any State to argue that the prohibition has been violated.⁹

5. When a State consents to another State's use of force on its territory, the prohibition is not violated.¹⁰ Commonly, consent will take the form of a request that another State's armed forces intervene in an internal armed conflict or fight against alleged terrorists. According to the International Law Commission, there can be no ambiguity about the existence of consent, which "must be freely given and clearly established. It must be actually expressed by the State rather than merely presumed on the basis that the State would have consented if it had been asked."¹¹ In cases in which a State has *not* given its consent to the use of force on its territory, the United Nations Charter foresees two exceptions that are applicable today to the prohibition in Article 2 (4): Security Council action pursuant to Chapter VII of the United Nations Charter; or as an act of a State's self-defence.¹²

⁹ United Nations Charter Commentary, 2012 at 218.

¹⁰ See article 20 of the articles on State responsibility: "Valid consent by a State to the commission of a given act by another State precludes the wrongfulness of that act in relation to the former State to the extent that the act remains within the limits of that consent." Consent to resort to force can only be granted by the highest government authorities and must be given freely, clearly, and in advance or at the time of the operation. See Commentary to International Law Commission Draft Articles on State Responsibility, art. 20 (available from http://legal.un.org/ilc/ texts/instruments/english/commentaries/9 6 2001.pdf). See also Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America) Merits, Judgment [1986], ICJ Rep, 14 at para. 246 (available from http://www.icj-cij.org/docket/files/70/6503.pdf). Moreover, a State cannot consent to violations of international human rights or humanitarian law being committed on its territory. See C. Heyns, "Extrajudicial, summary or arbitrary executions", 13 September 2013; and United Nations document A/68/382, para. 84 (available from http://justsecurity.org/wp-content/uploads/2013/10/UN-Special-Rapporteur-Extrajudicial-Christof-Heyns-Report-Drones.pdf).

¹¹ See Commentary to International Law Commission Draft Articles on State Responsibility, art. 20. Available from http://legal.un.org/ilc/texts/instruments/ english/commentaries/9_6_2001.pdf.

¹² For more on self-defence, see A. Henriksen, "Jus ad bellum and American Targeted Use of Force to Fight Terrorism Around the World", Journal of Conflict & Security Law (2014), vol. 19, no. 2, pp. 211-250. Available from http://jcsl.oxfordjournals.org/content/early/2014/01/29/jcsl.krt026. At times two additional but controversial exceptions have also been invoked: humanitarian intervention to prevent or put an end to massive violations of human rights and, within narrow conditions, limited force to protect or rescue a State's

United Nations Security Council measures

6. If, pursuant to Article 39 under Chapter VII of the United Nations Charter, the Security Council determines the existence of a threat to the peace, a breach of the peace, or an act of aggression, it can decide, under Article 42 of the United Nations Charter, to authorize States to take measures that include "action by air, sea or land forces as may be necessary to maintain or restore international peace and security".¹³

Self-defence

7. The second United Nations Charter exception applies when force is carried out in a State's exercise of the right of individual or collective self-defence. This right is enshrined in Article 51 of the United Nations Charter.¹⁴

8. Self-defence arises when an armed attack against a State requires a forcible response to remove the grave and persisting danger that it poses.¹⁵ It is important to note that the *threat or use of force* contemplated in Article 2(4) is a broader notion than the concept of *armed attack* under Article 51. Not every threat or use of force constitutes an armed attack, and therefore not every threat or use of force can justify acting in self-defence. Unless force amounting to an armed attack occurs, a State must renounce resorting to force in self-defence.¹⁶

own nationals on the territory of another State. See United Nations Charter Commentary, Randelzhofer and Dorr, 2012 at 222-8.

¹³ Charter of the United Nations, 1945, 1 UNTS XVI, [UN Charter], Article 42. Available from http://www.un.org/en/documents/charter/.

¹⁴ Article 51 states, "Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security." Available from http://www.un.org/en/ documents/charter/.

¹⁵ N. Lubell, *Extraterritorial Use of Force Against Non-State Actors*, Oxford University Press, 2010 at 53.

¹⁶ See for example Oil Platforms case, ICJ at para. 51 [2003], ICJ Rep, 161 (available from http://www.icj-cij.org/docket/files/90/9715.pdf); Congo v.

Defining an armed attack

9. An armed attack is "massive armed aggression against the territorial integrity and political independence of a state that imperils its life or government".¹⁷ The invasion or attack by a State's armed forces on another State's territory, or the use of weapons or bombing on another State's territory, would qualify as armed attacks. In certain circumstances, small, "pin-prick" uses of force may cumulatively amount to an armed attack, even though separately they may not amount to such.¹⁸ Significant force against the armed forces of another State operating abroad, whether on land, sea or in the air, can also count as armed attacks.¹⁹ However, many experts are reluctant to recognize that attacks abroad on ordinary nationals, on the grounds of their nationality, can amount to armed attacks for the purpose of the right to self-defence.²⁰

Armed attacks by non-State actors

10. The ICJ has stated that Article 51 "recognizes the existence of an inherent right to self-defence in the case of armed attack *by one*

Uganda, ICJ Reports [2005], 168 at para. 147 (available from http://www.icj-cij. org/docket/files/116/10455.pdf).

¹⁷ A. Cassese, International Law (OUP: Oxford, 2005) at 354, 469.

¹⁸ See Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America) Merits, Judgment [1986], ICJ Rep, 14 at para. 231; Oil Platforms at para. 64; Armed Activities at para. 146. See Y. Dinstein, *War, Aggression, and Self-Defence* (CUP: Cambridge, 2012) at 206; Lubell, *supra* at 54.

¹⁹ See Definition of Aggression, United Nations General Assembly resolution 3314 (XXIX), 14 December 1973, article 3 (d). Available from (http://daccess-dds-ny. un.org/doc/RESOLUTION/GEN/NR0/739/16/IMG/NR073916.pdf?OpenElement.

²⁰ United Nations Charter Commentary, Randelzhofer, Nolte, 2012 at 1413. For a contrary view, see Dinstein, *War Aggression and Self-Defense*, fifth ed., 2012 at 218, 255-9; see also the United Kingdom's 2004 Joint Service Manual of the Law of Armed Conflict: "Self-defence may include the rescue of nationals where the territorial state is unable or unwilling to do so." (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27874/JSP3832004Edition.pdf); 2015 U.S. Department of Defense Law of War Manual at para. 1.11.5.3: "A State's right to use force in self-defense may be understood to include the right to use force to protect its nationals abroad." (http://www.defense.gov/pubs/Law-of-War-Manual-June-2015.pdf).

State against another State" [emphasis added],²¹ seemingly excluding the possibility that self-defence could be triggered by an armed attack by a non-State actor without attributing its action to another State. However, a State's substantial involvement in the sending of, or assistance to, an organized armed group can amount to an armed attack when the group carries out armed force of a certain gravity against another State.²² More precisely, a State's encouragement, direct support, planning, preparation of, or unwillingness to take steps to prevent a group's attack could render the armed group's behaviour attributable to that State.²³ It has been argued that a State's inability to prevent a group's acts on its territory might also render the group's acts attributable to the State.²⁴

11. After 11 September 2001, the resort to force in self-defence against Al-Qaida, which was operating from Taliban-governed Afghanistan but not under its control, led to widespread agreement that armed attacks by independent non-State actors could also trigger the right to self-defence under Article $51.^{25}$ The ICJ also appears to

²¹ ICJ, Legal Consequences of the Construction of a Wall, ICJ Rep [2004], 136 at para. 139 (available from http://www.icj-cij.org/docket/files/131/1671.pdf). However, three ICJ judges have disagreed with this view. See also Armed Activities on the Territory of the Congo, (Democratic Republic of the Congo v. Uganda), Judgment, ICJ Reports 2005, paras. 146-147. For more on this debate, see for example Daniel Bethlehem, "Self-Defence against an Imminent or Actual Armed Attack by Non-State Actors", *American Journal of International Law*, vol. 106, 2012, at 769.

²² ICJ, *Nicaragua* at para. 195. *Congo v. Uganda* at paras. 146-7. In *Nicaragua*, the ICJ found that assistance to rebels through the supply of weapons and logistical support did not amount to an armed attack (see para. 195).

²³ United Nations Charter Commentary, Randelzhofer, Nolte, 2012 at 1418; see also Y. Dinstein *War, Aggression, and Self-Defence* (CUP: Cambridge, 2012) at 226-7; D. Kretzmer, "Targeted Killing of Suspected Terrorists: Extra-Judicial Executions or Legitimate Means of Self-Defence?" (2005), 16 EJIL 171 at 187 (available from http://www.ejil.org/article.php?article=292&issue=15); S. R. Ratner, "Self-Defense Against Terrorists: The Meaning of Armed Attack" (2010) in Counter-Terrorism Strategies in a Fragmented International Legal Order: Meeting the Challenges (L. Van den Herik and N. Schrijver, eds. 2013) 334.

²⁴ United Nations Charter Commentary, Randelzhofer, Nolte, 2012 at 1418-9.

²⁵ See, e.g., United Nations Security Council resolution 1368 (2001) and resolution 1373 (2001); NATO statement by the North Atlantic Council, 2001, 40 ILM 1267 (2001) (available from http://www.nato.int/docu/pr/2001/p01-124e.htm); OAS resolution on terrorist threat to the Americas, 2001, 40 ILM 1273 (2001) (available
have left open the possibility that the behaviour of non-State actors could in itself amount to an armed attack justifying self-defence, without the need to attribute the attack to a State.²⁶ The language of Article 51 is silent as to the nature of the party launching the armed attack, and therefore does not appear to restrict the right to self-defence to armed attacks by States. It has therefore been proposed that, if an attack by a non-State actor reaches the *scale and effects* of an armed attack committed by a State, it will qualify as an armed attack for the purpose of resorting to force in self-defence.²⁷

Necessity and proportionality

12. As a matter of customary international law, any resort to force in self-defence must comply with the two conditions of necessity and proportionality.²⁸ Both these standards apply each time self-defence action is taken against a foreign State's territory.²⁹

from http://www.oas.org/oaspage/crisis/rc.24e.htm). See D. Kretzmer, "Targeted Killing of Suspected Terrorists: Extra-Judicial Executions or Legitimate Means of Self-Defence?" (2005) 16 EJIL 171 at 186-7 (available from http://www.ejil. org/article.php?article=292&issue=15); N. Lubell, "Extra-Territorial Use of Force Against Non-State Actors" (OUP, Oxford, 2010), 35; D. Bethlehem, "Self-Defense Against an Imminent or Actual Armed Attack by Nonstate Actors", 106 AJIL 774 2012.

²⁶ ICJ, Congo v. Uganda at para. 147. Moreover, in their separate opinions, two ICJ judges took the view that self-defence action can be taken in response to an armed attack by non-State actors acting independently of any State assistance: "It would be unreasonable to deny the attacked State the right to self-defence merely because there is no attacker state, and the Charter does not so require." See separate opinion of Judge Koojmans at para. 30 (available from http://www.icj-cij.org/docket/files/116/10463.pdf) and separate opinion of Judge Simma at para. 12 (available from http://www.icj-cij.org/docket/files/116/10467.pdf).

²⁷ Ratner, *supra* at 340-341.

²⁸ See Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons [1996], ICJ Rep, 226, 8 July 1996 at para. 41 (available from http://www.icj-cij.org/docket/files/95/7495.pdf). See also Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America) [1986], ICJ Rep, 14 at para. 194; Oil Platforms case at paras. 43, 51, 73-77; Congo v. Uganda at para. 147. A third requirement of immediacy has also been proposed, requiring that there be no undue time-lag between the attack and the response in self-defence. See Y. Dinstein, *War, Aggression and Self-Defence*, fifth ed. at 233, 267.

²⁹ "[T]he exercise of the right of self-defence must be specifically justified vis-a-vis every State on whose territory self-defence action is taken." Claus Kress, "Some reflections on the international legal framework governing transnational armed

13. Necessity requires that force only be used when other nonforcible measures are not effective, not feasible, or have been exhausted. The principle of proportionality requires that the force in self-defence be measured in relation to the means required to end the threat.³⁰ In other words, the force used must not exceed what is required to thwart the attack and prevent continuing attacks.³¹

Imminent armed attacks

14. The right to self-defence arises following an armed attack,³² or in anticipation of an "imminent" armed attack.³³ "Imminent" means "instant, overwhelming, and leaving no choice of means, and no moment for deliberation".³⁴ It has been suggested that the notion of imminence should take into account the nature and gravity of the

conflicts", *Journal of Conflict & Security Law* (2010), vol. 15, no. 2, 245-274 at 251 (available from http://www.uni-koeln.de/jur-fak/kress/Materialien/Chef/ HP882010/Final19022011.pdf).

³⁰ See N. Lubell, *Extraterritorial Use of Force Against Non-State Actors*, Oxford University Press, 2010 at 63-68.

³¹ Some authors nevertheless consider that the kind and scale of force must be proportionate to the force used in the preceding attack. For a discussion, see N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 64.

³² See Brownlie, International Law and the Use of Force by States (1981) at 275-78; for a description of the debate, see Randelzhofer, "Article 51" in B. Simma (ed.), *The Charter of the United Nations: A Commentary* (Oxford University Press: Oxford, 2012) at 1421-22; I. Brownlie, "The Principle of Non-Use of Force in Contemporary International Law" in W. E. Butler (ed.); "The Non-Use of Force in International Law" (Nijhoff 1989) 17-27 at 24-25; G. M. Danilenko, "The Principle of Non-Use of Force in the Practice of the International Court of Justice" in W. E. Butler (ed.), "The Non-Use of Force in International Law" (Nijhoff 1989) 101-110 at 109.

³³ See D. Bethlehem; C. Greenwood in E. Wilmshurst, "Principles of International Law on the Use of Force by States in Self-Defence", The Royal Institute of International Affairs, Chatham House, October 2005 (available from http://www.chathamhouse.org/publications/papers/view/108106); Randelzhofer, "Article 51" in B. Simma (ed.), *The Charter of the United Nations: A Commentary* at 1421-22. See explanation of debate in N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 55-63.

³⁴ Letter from Mr. Webster to Lord Ashburton, Department of State, Washington, 6 August 1842 (available from http://avalon.law.yale.edu/19th_century/br-1842d.asp); see also N. Lubell, *Extra-Territorial Use of Force Against Non-State Actors* at 56. See also ICJ Rep [1997] 7, *Gabcikovo-Nagymaros Project* case at 42 (available from http://www.icj-cij.org/docket/files/92/7375.pdf).

threat, as well as the capabilities, means and technologies by which the attack would be delivered.³⁵

15. Some argue in favour of resorting to force to *prevent* an armed attack that is not necessarily imminent but that is likely.³⁶ This pre-emptive or preventive self-defence doctrine is justified on the basis of the difficulty of foreseeing an attack by a non-State actor. Instead of considering the imminence of the armed attack, some have argued in favour of evaluating whether the self-defence action is taken during the "last possible window of opportunity".³⁷ The pre-emptive approach is not widely adhered to,³⁸ as there is genuine concern about it leading to an escalation of violence or abuse as a "pretext for unprovoked aggression".³⁹

16. Of course, the lawful resort to force, whether by consent, with Security Council authorization, or in self-defence, does not absolve of the obligation to comply with IHRL and/or IHL.

³⁵ See N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 62.

³⁶ See A. D. Sofaer, "On the Necessity of Pre-emption," 14 EJIL 209 at 220 (2003) (available from http://www.ejil.org/pdfs/14/2/411.pdf). The debate is described in greater detail in N. Lubell, *Extra-Territorial Use of Force Against Non-State Actors* at 60-63. For a brief discussion of pre-emptive self-defence, see also United Nations General Assembly, "A More Secure World: Report of the High-Level Panel on Threats, Challenges and Change" (2004), A/59/565 (Report of the High-Level Panel) paras. 188-92 (available from http://www.un.org/en/ peacebuilding/pdf/historical/hlp_more_secure_world.pdf).

 ³⁷ See M. N. Schmitt, "State-Sponsored Assassination in International and Domestic Law" (1992) 17 Yale JIL 609 at 648.

³⁸ See United Nations Charter Commentary, Randelzhofer, Nolte 2012 at 1423.

³⁹ D. McGoldrick, From 9-11 to the Iraq War 2003 (Hart: Oxford, 2004) 76. For instance, the United Kingdom Attorney-General said before the House of Lords in 2004: "It is therefore the Government's view that international law permits the use of force in self-defence against an imminent attack but does not authorise the use of force to mount a pre-emptive strike against a threat that is more remote." (Lord Goldsmith, Attorney-General of the UK, House of Lords, Hansard HL, vol. 660, col 370 (21 April 2004) (http://www.publications. parliament.uk/pa/cm200304/cmselect/cmfaff/441/4060805.htm)).

II. Use of force under international human rights and humanitarian law

17. While the United Nations Charter sets out strict conditions for a State's lawful encroachment on another State's sovereign territory, a distinct body of law governs any decision to target specific *individuals* on any territory. It is critical to note that the *jus ad bellum* regime does not displace either the IHL or the IHRL regime. IHRL generally applies, and IHL contains specific rules for lethal targeting during armed conflict.

Targeting under international human rights law

Right to life

18. The concept of targeted killing clashes with the fundamental right to life, which is protected in treaties and customary international law.⁴⁰ The right to life, and the duty of States to protect the right to life, is expressed in article 6(1) of the International Covenant on Civil and Political Rights (ICCPR): "Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life."⁴¹ While some rights may be derogated from "in time of public emergency which threatens the life of the nation",⁴² the ICCPR does not allow any derogation from the right to life. Independently of any treaty provision, the right to life is also part of customary international law.⁴³ There is no territorial limitation to the customary right to life.⁴⁴

⁴⁰ See Y. Dinstein, "The Right to Life, Physical Integrity, and Liberty" in L. Henkin (ed.), *The International Bill of Rights: The Covenant on Civil and Political Rights* (New York: Columbia University Press, 1981), 114-137 at 114-116 and 118; W. P. Gormley, "The Right to Life and the Rule of Non-derogability: Peremptory Norms of *Jus Cogens*" in B. G. Ramcharan (ed.), *The Right to Life in International Law* (Dordrecht: Martinus Nijhoff, 1985), 120.

⁴¹ Of course, regional instruments also enshrine the right to life. See European Convention on Human Rights, Art. 2; American Convention on Human Rights, art. 4; African Charter on Human and Peoples' Rights, art. 4.

⁴² Article 4, ICCPR.

⁴³ See N. Melzer, *Targeted Killing in International Law* at 180-189.

⁴⁴ Ibid., at 212.

Use of lethal force

19. Under IHRL, the taking of life is only lawful where strictly necessary to protect against an imminent threat to life.

20. Any use of force must meet the principles of necessity, proportionality and precaution.⁴⁵

21. The "necessity" standard requires that lethal force only be used as a last resort in order to protect life, when other available means, such as arrest, remain "ineffective or without promise of achieving the intended result".⁴⁶ In light of this, The United Nations Special Rapporteur on the promotion and protection of human rights and fundamental freedoms, while countering terrorism, wrote in 2013 that "lethal remotely piloted aircraft attacks will rarely be lawful outside a situation of armed conflict, because only in the most exceptional of circumstances would it be permissible under international human

⁴⁵ See, e.g., United Nations Basic Principles on the Use of Force and Firearms by Law Enforcement Officials, adopted by the eighth United Nations Congress on the Prevention of Crime and the Treatment of Offenders, Havana, Cuba, 27 August to 7 September 1990 ("Basic Principles") at para. 9: "Law enforcement officials shall not use firearms against persons except in selfdefence or defence of others against the imminent threat of death or serious injury, to prevent the perpetration of a particularly serious crime involving threat to life, to arrest a person presenting such a danger and resisting their authority, or to prevent his or her escape [...]." (available from http://www.ohchr.org/EN/ ProfessionalInterest/Pages/UseOfForceAndFirearms.aspx); United Nations Code of Conduct for Law Enforcement Officials, adopted by the United Nations General Assembly resolution 34/169, 17 December 1979 ("Code of Conduct"), article 3 Commentary: "[...] law enforcement officials may be authorized to use force as is reasonably necessary under the circumstances for the prevention of crime or in effecting or assisting in the lawful arrest of offenders or suspected offenders [...] In general, firearms should not be used except when a suspected offender offers armed resistance or otherwise jeopardizes the lives of others and less extreme measures are not sufficient to restrain or apprehend the suspected offender." (Available from http://www.ohchr.org/EN/ProfessionalInterest/Pages/ LawEnforcementOfficials.aspx).

⁴⁶ Basic Principles, Rules 4 and 9. See also G. Nolte, "Preventive Use of Force and Preventive Killings: Moves into a Different Legal Order" (2004) 5 Theoretical Inquiries in Law 111 at 115 (http://www7.tau.ac.il/ojs/index.php/til/article/ viewFile/486/450).

rights law for killing to be the sole or primary objective of an operation".⁴⁷

22. Even if the use of force is considered necessary, the exercise of force must be in proportion to the seriousness of the offence and the legitimate objective to be achieved, minimizing damage and injury, and respecting and preserving human life.⁴⁸ The proportionality standard requires that only the smallest amount of force necessary be used. It also aims to limit the number of persons affected by the use of force as much as possible. As explained by Lubell, "For the use of lethal force to be considered a proportionate measure, its objective should be the prevention of a real threat to life, and outside the preservation of life, lethal force is likely to be disproportionate."⁴⁹

⁴⁷ Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism, Ben Emmerson, United Nations document A/68/389, 18 September 2013 at para. 60 (available from http://daccessdds-ny.un.org/doc/UNDOC/GEN/N13/478/77/PDF/N1347877.pdf?OpenElement). See also United Nations General Assembly, "Study on Targeted Killings" (28 May 2010), United Nations document A/HRC/14/24/Add.6, para. 33 (available from http://www2.ohchr.org/english/bodies/hrcouncil/docs/14session/A.HRC.14.24. Add6.pdf). Nevertheless, similarly to justifications for self-defence mentioned in the above section on jus ad bellum, it has been proposed that the resort to lethal force could be permitted even when a threat is not imminent: "[t]he idea that the state has to sit back and wait until another attack is imminent before acting to prevent it is unlikely to appeal to those who face the responsibility of protecting their citizens against terror." D. Kretzmer, "Use of Lethal Force against Suspected Terrorists" in A. M. Salinas de Frias, K. L. H. Samuel and N. D. White (eds.), Counter-Terrorism, International Law and Practice, Oxford University Press, 2012, 618-653 at 646-647. Here, too, the test proposed is that of a "window of opportunity" to use force against "a person who is actively involved in directing or carrying out terrorist actions and who has in the past eluded apprehension. If there is a high risk that unless the person is targeted he will direct and carry out further terrorist acts, it may be argued that use of lethal force may be absolutely necessary to protect others against those acts." D. Kretzmer, "The legal regime governing the use of lethal force in the fight against terrorism" in Counter-Terrorism Strategies in a Fragmented International Legal Order: Meeting the Challenges (L. Van den Herik and N. Schrijver, eds., 2013) Cambridge University Press, 2013, 559 at 581. See also N. Melzer, "Human Rights Implications of the Usage of Drones and Unmanned Robots in Warfare", European Parliament, Directorate-General for External Policies, Policy Department, 3 May 2013 at 31.

⁴⁸ Basic Principles, Rule 5.

⁴⁹ N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 173.

International law applicable to the use of armed unmanned aerial vehicles outside areas of "traditional battlefields"

23. As the United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions has explained, "in order to save lives, all possible measures should be taken 'upstream' to avoid situations where the decision on whether to pull the trigger arises, or to ensure that all the possible steps have been taken to ensure that if that happens, the damage is contained as much as is possible".⁵⁰ This requirement of precaution aims to protect both the targeted person and bystanders. The operation must be planned, organized and controlled in order to minimize recourse to lethal force as much as possible. Law enforcement agents must be given non-lethal means and equipment, and the greatest care must be applied in determining whether lethal force is justified.⁵¹

Extraterritorial application of IHRL

24. It is important to consider the debate over a State's application of IHRL when operations are carried out outside its own territory. The scope of application of the ICCPR is set out in article 2 (1), which says: "Each State Party to the present Covenant undertakes to respect and to ensure to all individuals *within its territory and subject to its jurisdiction* the rights recognized in the present Covenant" [emphasis added]. The ICJ has indicated that the obligations of the ICCPR bind a State that exercises its jurisdiction even *outside* its own territory.⁵² The United Nations Human Rights Committee has also taken the firm position that the instrument can apply to a State's jurisdiction if the State exercises "effective control" over the person.⁵⁴ Moreover, if a State has the ability to target and kill an individual, then it has been proposed that the individual in question would

⁵⁰ A/HRC/26/36, 1 April 2014 at para. 63 (available from http://www.ohchr.org/EN/ HRBodies/HRC/RegularSessions/Session26/Documents/A-HRC-26-36_en.doc).

⁵¹ See N. Melzer, *Targeted Killing* at 235.

⁵² ICJ, Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory (2004) at para. 111; ICJ, Congo v. Uganda, ICJ Reports [2005] at paras. 216-217.

⁵³ See United Nations Human Rights Committee General Comment 31, Nature of the General Legal Obligation Imposed on States Parties to the Covenant, United Nations document CCPR/C/21/Rev.1/Add.13, 26 May 2004, para. 10.

⁵⁴ Ibid.

be under the jurisdiction of that State.55 The key would be in "the exercise of authority or control over the individual in such a way that the individual's rights are in the hands of the state. If state agents, even if acting from a distance, are able to carry out their plan to target individuals with intent to take life, this might amount to a form of authority or control over the life of the individual."56 As Scheinin has explained: "a cruise missile, an anthrax letter sent from the neighboring country, a sniper's bullet in the head from the distance of 300 metres, or a poisoned umbrella tip on a crowded street" would all qualify.⁵⁷ To limit the extraterritorial application of human rights obligations solely to cases in which a person is in the hands of the State would allow a State to evade these obligations by choosing to act from a distance. This approach to extraterritorial jurisdiction applies equally to the obligation to respect the right to life under customary law, independent of any treaty adherence "if the affected right is part of customary international law then, by taking the extraterritorial forcible measure, a state may have violated its international legal obligations".58

Targeting under international humanitarian law

25. IHL applies only in armed conflict. It strikes a balance between the "necessities of war" on the one hand and the "requirements of humanity" on the other,⁵⁹ by protecting persons who are not or are no longer participating in hostilities, and by setting limits on means and methods (in other words, weapons and tactics) of warfare.

⁵⁵ See A/68/382, 13 September 2013 at paras. 49-51 (available from http://justsecurity. org/wp-content/uploads/2013/10/UN-Special-Rapporteur-Extrajudicial-Christof-Heyns-Report-Drones.pdf); N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 223, 230 and 235; N. Melzer, *Targeted Killing* at 139-139.

⁵⁶ N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 223.

 ⁵⁷ M. Scheinin, "Extraterritorial Effect of the International Covenant on Civil and Political Rights" in F. Coomans and M. Kamminga (eds.), *Extraterritorial Application of Human Rights Treaties* (Intersentia: Antwerp, 2004) 73-81 at 77-78.
⁵⁸ N. Lehell, F. textenting is in the of F. see Assistant New York Account 225.

⁵⁸ N. Lubell, *Extraterritorial Use of Force Against Non-State Actors* at 235.

⁵⁹ Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight. Saint Petersburg, 29 November/11 December 1868 (available from https://www.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDo cument&documentId=568842C2B90F4A29C12563CD0051547C).

International and non-international armed conflict

26. An international armed conflict (IAC) exists when two or more States resort to armed force against each other. This means "*any difference arising between two States and leading to the intervention of armed forces* is an armed conflict within the meaning of Article 2, even if one of the Parties denies the existence of a state of war" [emphasis added].⁶⁰ Nevertheless, some experts would submit that a certain threshold of force must be met before it can qualify as an IAC.⁶¹

27. In non-international armed conflict (NIAC), one or more non-State armed groups are participating in hostilities, either between themselves or against government armed forces. For a situation to qualify as an NIAC, it must meet a certain threshold of intensity and the armed group(s) involved must have a minimum level of organization.⁶² An NIAC may take place on the territory of more

⁶⁰ Commentary to the First Geneva Convention, J. Pictet (ed.), ICRC, 1952, p. 32 (emphasis added) (available from https://www.icrc.org/applic/ihl/ihl.nsf/Comment. xsp?action=openDocument&documentId=5AA133B15493D9D0C12563CD0042A1 5A). The ICRC Commentaries to the 1949 Geneva Conventions and 1977 Additional Protocols offer guidance and clarification on how to interpret their provisions, mainly on the basis of the work of Diplomatic Conferences and other preparatory work. For more on the definition of an IAC, see ICRC, "How is the Term 'Armed Conflict' Defined in International Humanitarian Law?", Opinion Paper, March 2008 (available from https://www.icrc.org/eng/assets/files/other/opinion-paper-armed-conflict.pdf). See also ICTY, "The Prosecutor v. Dusko Tadic", Decision of the Defence Motion for Interlocutory Appeal on Jurisdiction, IT-94-1-A, 2 October 1997, para. 70.

⁶¹ The International Law Association has written, "The violence must be organized and intense—even between sovereign states—before the otherwise prevailing peacetime rules are suspended." Available from http://www.ila-hq.org/en/ committees/index.cfm/cid/1022. Moreover, some experts would argue that targeting non-State armed groups within a foreign State and without its consent does not automatically amount to an IAC. For a discussion of this question, see D. Akande, "Classification of Armed Conflicts: Relevant Legal Concepts" in *International Law and the Classification of Conflicts*, E. Wilmshurt, ed., OUP, 2012, 32 at 70-79.

⁶² D. Schindler, "The different types of armed conflicts according to the Geneva Conventions and Protocols", Collected Courses of the Hague Academy of International Law, Tome 163, 1979-II, 125-156 at 147. See ICTY, The Prosecutor v. Fatmir Limaj, Judgment, IT-03-66-T, 30 November 2005, paras. 94-170 (available from http://www.icty.org/x/cases/limaj/tjug/en/ lim-tj051130-e.pdf). See also The Prosecutor v. Haradinaj, Judgment, IT-04-

than one State and may involve more than one organized armed group and more than one State as parties. A traditional NIAC occurs within the borders of a State in which armed forces are participating in the conflict. Nevertheless, there is growing recognition that an NIAC can extend to the territory of another State whose forces may not necessarily be involved in the armed conflict. The most typical scenario is the "spill-over", where government forces are pursuing an organized armed group from their territory to that of an adjacent country. Other scenarios in which NIACs extend beyond the territory of a State include States or multinational forces fighting alongside another Government's forces against one or more organized armed groups on that Government's territory; organized armed groups fighting each other across contiguous State borders; and the armed forces of a State engaging in cross-border hostilities against an organized armed group operating in a neighbouring country without that country's control or support.⁶³

Distinction

28. One of the fundamental rules of IHL requires that parties to an armed conflict distinguish between civilian persons and civilian objects on the one hand, and combatants and military objectives on the other, and that they direct their operations only against combatants and military objectives.⁶⁴ In case of doubt, a person will be considered to be a civilian. The same is true for objects.⁶⁵

⁸⁴⁻T, 3 April 2008 at paras. 49 and 60 (available from http://www.icty.org/x/ cases/haradinaj/tjug/en/080403.pdf). See also article 1, Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977. For more on the definition of a NIAC, see ICRC, "How is the Term 'Armed Conflict' Defined in International Humanitarian Law?"

⁶³ See ICRC, Challenges Report, 2011. Available from https://www.icrc.org/eng/ resources/documents/report/31-international-conference-ihl-challenges-report-2011-10-31.htm.

⁶⁴ Article 48, Additional Protocol I. See also Art. 51(2) and 52(1) Additional Protocol I and ICRC, *Customary International Humanitarian Law*, Volume I: Rules (hereinafter "ICRC Customary Law Study") (2005, Cambridge University Press Cambridge), Rules 1 and 7 (available from https://www.icrc.org/ customary-ihl/eng/docs/v1_rul).

⁶⁵ Art. 50(1) and 52(3), Additional Protocol I, respectively.

29. An object is a military objective if, by its nature, location, purpose or use, it contributes effectively to the military action of the enemy and its partial or total destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage. Any object that does not fall under the definition of a military objective is a civilian object and must not be attacked.⁶⁶

30. In an IAC, members of the armed forces of a party to the conflict can be lawfully targeted. In an NIAC, members of the non-State armed group party to the conflict may be targeted where they directly participate in hostilities, or, potentially, where they have a "continuous combat function".⁶⁷

31. Persons who are not members of the armed forces or of an organized armed group of a party to the conflict are civilians and are entitled to protection against direct attack unless and for such time as they directly participate in hostilities.⁶⁸

32. IHL also prohibits attacks on persons who are recognized as *hors de combat*, and, in other words, defenceless.⁶⁹ Article 41 of Additional Protocol I to the 1949 Geneva Conventions states that a person is *hors de combat* if: "(a) he is in the power of an adverse Party; (b) he clearly

⁶⁶ Article 52(1), Additional Protocol I.

⁶⁷ ICRC, Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law (2009, Geneva), chapter II (available from https://www.icrc.org/eng/assets/files/other/icrc-002-0990.pdf).

⁶⁸ According to the ICRC Interpretive Guidance on Direct Participation in Hostilities, to qualify as direct participation in hostilities, a civilian's specific act must be on a spontaneous, sporadic or unorganized basis and meet the following three cumulative criteria: (1) the act must be likely to adversely affect the military operations or military capacity of a party to an armed conflict or, alternatively, to inflict death, injury or destruction on persons or objects protected against direct attack; (2) there must be a direct causal link between the act and the harm likely to result either from that act, or from a coordinated military operation of which that act constitutes an integral part; and (3) the act must be specifically designed to directly cause the required threshold of harm in support of a party to the conflict and to the detriment of another. Measures in preparation of a specific act of direct participation in hostilities, and the deployment to and the return from the location of the act also form an integral part of that act (ICRC, Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law (2009, Geneva), chapter V).

⁶⁹ Commentary to article 41, Additional Protocol I, at para. 1630.

expresses an intention to surrender; or (c) he has been rendered unconscious or is otherwise incapacitated by wounds or sickness, and therefore is incapable of defending himself; provided that in any of these cases he abstains from any hostile act and does not attempt to escape".⁷⁰

33. In addition to these restraints, it has been submitted that, according to the guiding principles of military necessity and humanity, "it would defy basic notions of humanity to kill an adversary or to refrain from giving him or her an opportunity to surrender where there manifestly is no necessity for the use of lethal force".⁷¹ Nevertheless, experts have argued that in large-scale confrontations, the ability or opportunity to capture rather than kill may not be available.⁷²

Proportionality

34. Civilian persons and objects who are in the vicinity of a military objective are at times incidental victims of an attack on it. While it is legally accepted that civilian persons and objects may be incidentally harmed in this way, the rule of proportionality dictates that "incidental loss" of civilian life or property must not be excessive in relation to the concrete and direct military advantage anticipated from an attack against a military objective. Attacks that do not comply with the rule of proportionality are forbidden.⁷³ The International Tribunal for the Former Yugoslavia (ICTY) has said, "In determining whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from

⁷⁰ See also ICRC Customary Law Study, Rule 47. Available from https://www.icrc. org/customary-ihl/eng/docs/v1_rul_rule47.

⁷¹ ICRC, Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law (2009, Geneva), chapter IX at 82. Available from https://www.icrc.org/eng/assets/files/other/icrc-002-0990.pdf.

⁷² See ICRC and TMC Asser Institute, "Summary Report", Fourth Expert Meeting on the Notion of Direct Participation in Hostilities, 27-28 November 2006. Available from https://www.icrc.org/eng/assets/files/other/2006-03-report-dph-2006-icrc.pdf.

⁷³ Article 51(5)(b), Additional Protocol 1; Rule 14, ICRC Customary Law Study. Available from https://www.icrc.org/customary-ihl/eng/docs/v1_rul_rule14.

the attack."⁷⁴ It is based on information reasonably available at the time of attack that a proportionality assessment must be carried out.

Precautions in attack

35. In addition, IHL requires that, in the conduct of military operations, constant care must be taken to spare the civilian population, civilians and civilian objects. As a result, parties to an armed conflict must take "feasible" precautions in carrying out attacks in order to avoid and minimize incidental loss of civilian life, injury to civilians and damage to civilian objects. Feasible precautions have been defined as "those precautions which are practicable or practically possible taking into account all circumstances ruling at the time, including humanitarian and military considerations".⁷⁵

36. Some key precautionary measures⁷⁶ include the following:

- Doing everything feasible to verify that targets are military objectives.
- Taking all feasible precautions in the choice of means and methods of warfare with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects.
- Doing everything feasible to assess whether the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.
- Doing everything feasible to cancel or suspend an attack if it becomes apparent that the target is not a military objective or that the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a

⁷⁴ Prosecutor v. Stanislav Galic, Case No. IT-989-29-T, Trial Chamber Judgment, 5 December 2003 at para. 58. Available from http://www.icty.org/x/cases/galic/ tjug/en/gal-tj031205e.pdf.

⁷⁵ Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended on 3 May 1996, art. 3(10). Available from https://www.icrc.org/ihl/INTRO/575.

⁷⁶ See Additional Protocol I, article 57, and Rules 16-21, ICRC CIHL Study. Available from https://www.icrc.org/customary-ihl/eng/docs/v1_rul.

combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.

- Giving effective advance warning of attacks which may affect the civilian population, unless circumstances do not permit.
- When a choice is possible between several military objectives for obtaining a similar military advantage, the objective to be selected must be that the attack on which may be expected to cause the least danger to civilian lives and to civilian objects.

Specific rules on weapons

37. IHL contains some specific rules prohibiting or restricting the use of certain weapons. Some rules, derived from the fundamental rule of distinction described below, prohibit the use of weapons which are by nature indiscriminate⁷⁷ or which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment.⁷⁸ Another specific rule aims to protect *combatants* by prohibiting means and methods of warfare, which are of a nature to cause superfluous injury or unnecessary suffering.⁷⁹ Flowing from these two basic rules are a number of additional prohibitions and restrictions that can be found both under customary international law⁸⁰ and treaty law, such as the Biological Weapons Convention, the Chemical Weapons Convention, the Anti-Personnel Mine Ban Convention, the Convention on Cluster Munitions and Protocols to the Convention on Certain Conventional Weapons.

⁷⁷ See Rule 71, ICRC Customary Law Study (available from https://www.icrc.org/ customary-ihl/eng/docs/v1_rul_rule71) and art. 51(4), Additional Protocol I of 1977.

⁷⁸ See art. 35(3) and 55, Additional Protocol I of 1977 and Rule 76, ICRC Customary Law Study (available from https://www.icrc.org/customary-ihl/eng/ docs/v1_rul_rule76).

⁷⁹ See article 35(2) Additional Protocol I of 1977 and Rule 70, ICRC Customary Law Study (available from https://www.icrc.org/customary-ihl/eng/docs/v1_rul_ rule70).

⁸⁰ See ICRC Customary Law Study, Chapter IV on Weapons. Available from https://www.icrc.org/customary-ihl/eng/docs/v1_cha.

III. Conclusion

38. Developments in weapon technology can improve targeting precision and accuracy, while decreasing the presence of attacking forces directly on the battlefield. Today's armed UAVs have greater endurance and sensor capacity, carry enhanced guidance technology and respond faster between identifying a target and delivering force against it, all at significant distances from and reduced risk to their operators.⁸¹

39. This can serve to improve military commanders' situational awareness and target identification, allow for a more robust assessment of potential collateral damage, widen the range of precautionary measures in advance of an attack and permit more precise targeting, with the real potential of lowering the risk of civilian casualties.⁸² As the International Committee of the Red Cross has stated, "from the perspective of international humanitarian law, any weapon that makes it possible to carry out more precise attacks, and helps avoid or minimize incidental loss of civilian life, injury to civilians, or damage to civilian objects, should be given preference over weapons that do not. Whether the use of armed drones does indeed offer these advantages will depend on the specific circumstances."⁸³

40. Despite these perceived advantages, armed UAVs have elicited much unease about a weakening of the standard for deploying force, and raised new challenges in the application and interpretation of international law.⁸⁴ Indeed, it is feared that the ability of UAVs to cover vast ranges over long periods, gather more information, and reduce risks to air crew, may actually increase opportunities to attack, leading to concerns about a concomitant rise in civilian exposure to harm. Their use has also elicited scrutiny into the international

⁸¹ United Nations document A/68/382, 13 September 2013, at para. 12; United Nations document A/68/389 at para. 25; M. Wagner, "Unmanned Aerial Vehicles" at para. 11; W. Boothby, "Interacting Technologies and Legal Challenge" in W. Boothby, Conflict Law, The Influence of New Weapons Technology, Human Rights and Emerging Actors at 98-99.

⁸² United Nations document A/68/389 at para. 28.

⁸³ ICRC, interview, "The use of armed drones must comply with laws," 10 May 2013. Available from https://www.icrc.org/eng/resources/documents/interview/2013/05-10-drone-weapons-ihl.htm.

⁸⁴ United Nations document A/68/382, 13 September 2013 at para. 17.

legal frameworks within which they are used and the interpretation of applicable rules. As explained by the United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions, "Legal uncertainty in relation to the interpretation of important rules on the international use of force presents a clear danger to the international community. To leave such important rules open to interpretation by different sides may lead to the creation of unfavourable precedents where States have wide discretion to take life and there are few prospects of accountability. Such a situation undermines the protection of the right to life. It also undermines the rule of law, and the ability of the international community to maintain a solid foundation for international security."⁸⁵ States' lack of transparency on their operations, the applicable legal frameworks or their criteria for selecting targets adds to this series of concerns.⁸⁶

41. There is no doubt that international law circumscribes the use of UAVs in the deployment of lethal force. While a strict application and protective interpretation of the relevant legal frameworks may alleviate some common concerns about their use in lethal targeting, this can only be complementary to the important ethical, moral and political debates that must accompany the development and use of such weapon systems.

⁸⁵ United Nations document A/HRC/26/36 at para. 137, 1 April 2014. Available from http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session26/Documents/ A-HRC-26-36_en.doc.

⁸⁶ United Nations document A/68/389, 18 September 2013.

Chapter III Implications of unmanned aerial vehicles and related emerging technologies

1. Incremental advances in the capacity of remotely operated unmanned aerial vehicles (UAVs) to perform a range of military missions are changing the nature of contemporary conflicts, and could have ramifications for future strategic stability.¹ These advances, particularly in the so-called "enabling components" of UAVs, which include sensors, software, materials, propulsion, guidance and communications, are improving the capacity of these platforms to carry heavier payloads, including weapons over greater distances for longer periods and with greater autonomy. In general, these kinds of developments will make armed UAVs more capable, increasingly sophisticated and cheaper. More broadly, advances in enabling components can also drive the development of new and emerging types of weapons, such as fully autonomous weapons, that may pose similar challenges as armed drones to humanitarian concerns, human rights and international security.

2. It has been argued that advances in UAV technology will inevitably lead to the proliferation of systems of concern to international security— as even hobbyist or commercial UAVs acquire capabilities that may permit them to be armed, used as flying bombs, or deployed *en masse* in swarming attacks.² However, technical advances in UAV technology will occur against a backdrop of developments in other technologies that have a bearing on strategy and the conduct of armed violence in the twenty-first century. These include countermeasures to drones, such as improved anti-aircraft and anti-missile systems, as well as the ability to interfere with or jam the radio signals necessary to remotely operate even the most sophisticated systems. Cyberattacks on UAV subsystems such as guidance and navigation that spoof or otherwise manipulate key functions are also possible developments.

¹ This section was prepared by John Borrie, United Nations Institute for Disarmament Research.

² Kelley Sayler (2015), A World of Proliferated Drones: A Technology Primer, A World of Proliferated Drones Series, Washington D.C., Center for a New American Security. See also chapter I.

3. Overall, the interactions of these many factors and the preventative measures that can be put into place to overcome them combine to defy concrete predictions. For instance, one common fear associated with UAVs has yet to be actualized—namely their use by non-State actors to deliver harmful, biological, chemical or radiological substances. The likelihood, effectiveness and sustainability of such uses has depended in large part on matters unrelated to UAVs themselves, namely the enactment of national and international export controls and prohibitions, as well as efforts in the fields of intelligence, counter-terrorism and law enforcement.

4. This brief discussion restricts itself to suggesting five ways in which ongoing technical advances in UAV-related technology, in particular in armed UAVs, could have broad implications for international peace, security and stability. UAV technology in itself is not revolutionary in the way that, for example, the introduction of nuclear weapons was for political and military strategy from the 1940s. Nevertheless, as will be explored below, the development and use of armed UAVs can strain existing political, legal and ethical understandings about how conflict can and should be legitimately waged. Not least, it poses challenges to preserving and strengthening the right to life. The five areas briefly discussed below are not exhaustive.

I. Altering incentives in the use of force

5. Scholars have long observed that the increasing range of weapons and their delivery systems may increase the psychological distance between the attacker and the attacked.³ Armed UAVs are not unique in this regard,⁴ and recent evidence suggests that this distance might not be as great as previously believed.⁵ However, the allure of prosecuting conflict remotely and with little or no apparent risk to one's own military

³ Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Backbay Books, 1995), pp. 99-137.

⁴ For instance, the operators of cruise missiles may be located far away from their targets.

⁵ Some United States drone pilots have suffered adverse psychological effects. See Wayne Chappellea, Tanya Goodman, Laura Reardon and William Thompson, "An analysis of post-traumatic stress symptoms in United States Air Force drone operators", *Journal of Anxiety Disorders*, vol. 28, issue 5, June 2014, pp. 480-487.

personnel and civilian population will remain strong for policymakers, especially given the cost advantages of armed UAVs over alternatives such as manned strike aircraft, the relative expendability of drones and their increasing flexibility.

6. In this regard, it has been argued that prosecuting conflict at no risk to one's own forces or population may lower the threshold for using force. UAVs can enable States to contemplate the use of force in areas that are too remote or too dangerous for ground forces to operate alone or at all. This dynamic can lead to the eroding of social or political barriers to the use of force within States that operate armed drones—especially in view of the relative ease with which details about drone targeting may be kept out of the public eye.

While this lower risk has been evidenced by the kinds of conflict 7. in which armed UAVs have been used to date,⁶ this dynamic may not prevail in the future as armed UAVs conceivably enter into other military roles, including combat against other drones or manned military units engaged in active hostilities. Just as early manned aircraft were initially used for forward observation, then ground attack and then eventually air-to-air combat, the expanding use of UAVs will force doctrinal change in militaries that will have-as yet-uncertain consequences for the protection of civilians as drone warfare develops. For example, despite the invention of the fighter-interceptor in the First World War and widespread condemnation of aerial bombing, bomber development continued and became much more indiscriminate and destructive against civilian populations in succeeding wars.⁷ In other words, policymakers cannot assume that drone warfare will remain without cost for their States and civilian populations in the future as the technology develops.

8. A related issue is that the "ready availability of drones may lead to States, where they perceive their interests to be threatened, increasingly engaging in low-intensity but drawn-out applications of force that

⁶ Namely, in targeted strikes in uncontested airspace against adversaries without means to retaliate.

⁷ See Yuki Tanaka and Marilyn B. Young (eds.), *Bombing Civilians: A Twentieth-Century History* (The New Press, 2009).

know few geographical or temporal boundaries".⁸ This so-called global battlefield is problematic for several reasons, not least in that it threatens to weaken aspects of the rule of law (see section II below), because privileging the use of force over other alternatives undermines the role of diplomacy and international regimes and institutions, the right to life and the notion that peace should be the norm, which is necessary for sustained human development.⁹

9. In this respect, two points should be noted. The first is that armed UAV technology has been available to very few States until recently. This monopoly will erode as other States field their own armed UAVs, a number of which are already under development. The second point restates the argument earlier about the historical development of other weapons and delivery platforms that suggests that no capability enabling a State (or States) to pursue hostilities with impunity is likely to last indefinitely. Those without access to the technology (for instance, non-State armed groups) will—and already do—seek other means to strike back against combatants and/or civilians of UAV-using States. Equally, if it lowers the threshold for waging conflict, the use of armed UAVs may alter incentives for other types of attacks, with negative effects both for civilian protection and for constraining the extent of a conflict.

II. Tempting States to interpret legal frameworks to permit fuller exploitation of the expanded capabilities of armed UAVs

10. The use of drones for intelligence, surveillance and reconnaissance, as well as for armed strikes, has raised a number of legal and political challenges.¹⁰ These uses challenge widely held legal understandings in humanitarian law, human rights law and

⁸ (2013), "Report of the Special Rapporteur on extrajudicial summary or arbitrary executions" (Christof Heyns), A/68/382, Geneva, United Nations Human Rights Council, p. 5.

⁹ Simon Jenkins, "Drones Are Fool's Gold: They Prolong Wars We Can't Win", *The Guardian*, 10 January 2013.

¹⁰ For an overview see "Report of the Special Rapporteur on extrajudicial summary or arbitrary executions", A/68/382.

even the laws concerning State neutrality in war¹¹—with broader consequences for the vitality of the international legal framework. Conceivably, these developments could result in backward steps in legal protections available to both combatants and civilians under international humanitarian law (IHL), and for existing human rights law norms if they create a more permissive environment for the use of new types of weapons including armed drones. On the other hand, it should also be acknowledged that the use of UAVs can also permit "more eyes on the target", which may assist military commanders in making more accurate assessments of the impacts of strikes and thus improving their ability to adhere to IHL rules.¹²

11. One major issue has arisen in this regard in the context of noninternational armed conflict. It revolves around identifying who is deemed a legal target for lethal strikes, especially in cases in which a person is a member of an organized armed group located on the territory of a non-belligerent State, or who moves into such territory after taking a direct part in an ongoing conflict. The International Committee of the Red Cross (ICRC) has argued that a person should not be considered a lawful target in such situations.¹³ Technological developments will create strong incentives for armed forces to promote reinterpretation of previous legal understandings to justify attacks under broader circumstances. Key among these changes include improved optical and particularly facial recognition systems, the longer capability for drones to loiter and monitor potential targets and the development of increasingly sophisticated explosive weapons, such as "mini-missiles", that are fashioned specifically for attacks in built-up areas. Those attacks also raise issues under generic IHL rules, such as discrimination and proportionality. Moreover, it has

¹¹ See Jelena Pejic, "Extraterritorial targeting by means of armed drones: Some legal implications", *International Review of the Red Cross*, May 2015. Available from https://www.icrc.org/en/document/jelena-pejic-extraterritorial-targetingmeans-armed-drones-some-legal-implications.

¹² Fielding-Smith, A. and C. Black, "When you mess up, people die: civilians who are drone pilots' extra eyes" *The Guardian* (30 July 2015), London. Available from http://www.theguardian.com/us-news/2015/jul/30/when-you-mess-up-people-diecivilians-who-are-drone-pilots-extra-eyes.

¹³ ICRC (2014), ICRC Statement at the Human Rights Council on 22 September 2014: Ensuring the use of drones in accordance with international law (27th Session HRC).

been pointed out that even if such attacks are carried out with the permission of the State on whose territory the attack is occurring, that State is not permitted to waive the targeted person's right to life. Conversely, if the attack does not have that State's permission, then the attack is a violation of international law.

III. Use of armed drones by covert armed forces in ways that do not permit sufficient transparency or accountability

12. Several of the world's militaries already have programmes to operate armed UAVs for use in combat. To date, however, the longest-running armed drone operations have been run by the covert armed forces of States to strike ground targets (usually individuals of interest) in countries such as Pakistan, Somalia and Yemen. Although it is discussed in more depth later in this study, an important point to note here is that, historically, such covert armed forces have been less transparent than regular militaries about the criteria for their drone strikes, the benefit expected or the civilian harm caused. It has proven more difficult to hold them accountable for alleged violations of the law, to hold the relevant States to their responsibilities to the civilian victims of such strikes¹⁴ or even for policymakers or the media in that country to learn what is going on. It also creates confusion about which legal frameworks apply for those attacks that are alleged to amount to extrajudicial killings. As the ICRC observed, "States have sometimes denied that IHL applies to a situation that may be said to amount to an armed conflict, while on other occasions they have. conversely, extended the applicability of IHL to situations that do not fit the legal description of an armed conflict."15

13. This trend of use of armed drones by covert armed forces has not ended and is likely to intensify for several reasons. The first is the possession of armed drones in more hands, particularly covert armed forces, which are the most likely actors to be engaged in domestic counter-insurgency or counter-terrorism campaigns, or unconventional

¹⁴ See, for instance, *After the Dead Are Counted: U.S. and Pakistani Responsibilities* to Victims of Drone Strikes, Open Society Foundations, November 2014.

¹⁵ ICRC (2014), ICRC Statement at the Human Rights Council on 22 September 2014.

and clandestine strike operations abroad. The second reason is the increasing urbanization of warfare: more and more military targets are located within heavily populated areas that are risky and difficult for State forces to manoeuvre within—often fighting against irregular adversaries with little interest in sparing civilians during their violent engagements. For those with UAVs, these systems can provide an alternative way to strike targets in urban areas that is less hazardous to their forces. This asymmetry between "conventional" militaries and highly equipped covert armed forces on one side, and their lower-tech opponents on the other, is likely to increase rather than decline in the foreseeable future.¹⁶

IV. Increasing use by non-State armed groups or even individuals

14. By historical standards, States have been extraordinarily effective in keeping fissile material for nuclear explosive devices out of the hands of non-State armed groups or individuals with hostile intent. However, for most other military technologies, the non-proliferation record is not so good. Drones are unlikely to be an exception. In this context, it is conceivable that non-State armed groups could misuse dual-use technologies, for instance cellular networks for guidance or control functions for drones, or 3D printers for producing replacement parts or offensive modifications for drones. Nevertheless, non-State armed groups are unlikely to be able to make significant use of the most sophisticated military drones even if, in principle, they could acquire them. This is because such UAVs tend to require considerable technical and logistical support to function, something that is likely to be beyond non-State armed groups' capacities. As noted earlier, non-State actors are likely instead to try to exploit smaller, slower but increasingly ubiquitous hobbyist and commercial UAVs, which they might be able to deploy in significant numbers. It remains, however, to be seen just how effective such attacks would be in any military sense against competent, regular adversaries with access, for instance,

¹⁶ See, for example, Alexandre Vautravers (2010), "Military Operations in Urban Areas", *International Review of the Red Cross* 92: 437-52.

to defence systems against missiles or aircraft. Many civilian drones are slow enough to be targeted and shot down with rifle fire.

15. Instead of swarming against one target, non-State armed groups might see greater effect in using many UAVs against multiple targets simultaneously, conceivably filling a role now occupied by crudely manufactured ballistic missiles only with greater controllability and precision.¹⁷ By attacking or interfering with critical infrastructure at a key moment (for instance, electrical power lines or substations, or aircraft approach paths to airports), well-orchestrated non-State actors might temporarily cause widespread societal disruption, overwhelm official response capacity and conceivably cause embarrassment to the authorities or even some loss of life (a passenger jet crash, for instance). It is not clear, however, what consequences such attacks would have for regional and international stability.

16. Although this section is mainly concerned with UAVs, remotely operated surface boats or submersibles deserve special mention. Marine systems are not so tightly restricted in payload—one could carry a considerable amount of explosives—and could conceivably attack, alone or in a swarm, surface ships. This possibility has been taken seriously enough by the United States Navy that it has begun experimenting with surface vessel drones to defend against it, as well as suicide attacks like the one against the USS *Cole*, an American warship, in Yemen on 12 October 2000 that killed 17 American sailors and injured 39.¹⁸

¹⁷ The author is indebted to Dr. Alexandre Vautravers for this point.

¹⁸ Drone boats equipped with this technology, called Control Architecture for Robotic Agent Command and Sensing (CARACaS), "decide on their own where to go, when to steer, and when to apply the throttle. A human operator, who can be in another ship, a helicopter, or well away from the action, uses a laptop to tell the swarmboats which craft are to be protected and which are to be attacked." See Jordan Golson, "The Navy's Developing Little Autonomous Boats to Defend Its Ships", *Wired* (10 June 2014). Available from http://www.wired.com/2014/10/ navy-self-driving-swarmboats.

V. Automation and compressing the "time to strike" process

17. The United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions has observed of drones that, "Among other things, they provide the strategic advantage of greatly reducing the time between the identification of a potential target that could be a great distance away and the deployment of deadly force against that target."¹⁹ As well as underlining the legal and ethical issues described above in section II, this trend of compressing the "time to strike" process is likely to further drive the development of armed drone capabilities including, where it is feasible, automation of target acquisition and identification. This will inevitably raise the question "when is a drone a drone, or a lethal autonomous weapon system?"

18. The need for humans to make decisions about targeting and attack has become a major issue of international concern in recent discussions, for instance in the context of the Human Rights Council²⁰ and the Convention on Certain Conventional Weapons, in large part generated by civil society campaigners and experts.²¹ In particular, they have argued for "meaningful human control"²² to be a prerequisite for armed robotic systems, an idea that has received support from a number of States. Set alongside this, a UNIDIR study on the autonomization of weapons technology has underlined that autonomy is a spectrum of capabilities.²³ As such, it may be difficult to identify a particular "bright line" in the future between a remotely

¹⁹ "Report of the Special Rapporteur on extrajudicial summary or arbitrary executions", A/68/382, p. 4.

²⁰ "Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions" (Christof Heyns), United Nations document A/HRC/23/47, 9 April 2013.

²¹ See for instance, Charli Carpenter, "Beware the Killer Robots: Inside the Debate over Autonomous Weapons", *Foreign Affairs* (2013). Available from http://www.foreignaffairs.com/articles/139554/charli-carpenter/beware-the-killerrobots.

²² Article 36, "Key areas for debate on autonomous weapons systems", (London, May 2014). Available from http://www.article36.org/wp-content/uploads/2014/05/ A36-CCW-May-2014.pdf.

²³ UNIDIR, "The Weaponization of Increasingly Autonomous Technologies: Considering how Meaningful Human Control might move the discussion forward" (Geneva, 2014).

piloted UAV with many autonomous functions (e.g., taking off, flying to the target area, identifying targets, arming its weapons for launch, etc.) and one that is fully autonomous, especially if the system can operate in different modes (e.g., semi-autonomous versus fully autonomous for the purposes of targeting in attack) or because of lack of transparency by the system's user about its capabilities.

19. Consequently, the development and use of armed drones is likely to provide the drive for increasingly autonomous capabilities that pose further important challenges to international order and the right to life. It may be that drones one day will be thought of as a transitional technology on the way to much more sophisticated and destructive ones, a little like the early biplane indicated the way towards the modern combat aircraft.

VI. Conclusions

20. While, on balance, many of the implications surveyed in this section are assessed to have negative effects on international peace, security and stability, it was also acknowledged that UAV technologies in some circumstances can facilitate greater adherence to humanitarian principles. What is important to observe about armed UAVs is that their introduction has not only come as a replacement or upgrade of older military technology, but also as an enabler for novel military missions and capabilities. As these technologies, until the present time, have been enjoyed by only a small number of the most technically sophisticated State actors for use in predominantly asymmetric situations, the implications have been "limited" to the circumstances surrounding specific incidents of use and the impact on civilians.²⁴ However, the inevitable diffusion of UAVs and their associated technologies could have increasingly grave implications for international peace and security, especially as the ways in which they should relate to fundamental legal principles, particularly concerning jus ad bellum and jus in bello, remain unsettled or disputed.

²⁴ See Columbia Law School Human Rights Clinic and the Center for Civilians in Conflict, "The Civilian Impact of Drones: Unexamined Costs, Unanswered Questions", 2012. Available from http://web.law.columbia.edu/sites/default/files/microsites/humanrightsinstitute/files/The%20Civilian%20Impact%20of%20Drones.pdf.

Chapter IV

Transparency, oversight and accountability for the use of armed unmanned aerial vehicles outside areas of active hostilities

1. This chapter examines ways and means of increasing transparency, oversight and accountability for the use of armed unmanned aerial vehicles (UAVs) outside areas of active hostilities. It explores the motivations for seeking transparency, oversight and accountability mechanisms; surveys existing legal requirements; discusses issues related to transparency and confidence-building measures and their relationship to accountability; suggests specific measures to increase transparency in the development, acquisition, stockpiling and transfer of armed UAVs; and proposes an option for taking forward the development of a mechanism through a multilateral framework.

2. While the legal aspects of the use of armed UAVs have been addressed extensively in academic and policy forums and at the Human Rights Council, there has been far less published research on possible arms control approaches to address concerns raised by armed UAVs. To facilitate the development of this aspect of the study, the United Nations Office for Disarmament Affairs and UNIDIR co-organized an "International seminar on improving transparency, oversight and accountability for any use of armed unmanned aerial vehicles outside areas of active hostilities", held in Geneva on 15 and 16 June 2015. The seminar was made possible by the financial support provided by Germany, Switzerland and the Open Society Foundations.

3. The international seminar, which was held under the Chatham House rule, provided for in-depth discussions on the legal requirements for transparency and accountability for the use of armed UAVs in various contexts and situations, as well as on mechanisms for increasing transparency, oversight and accountability. It included participation by governmental and non-governmental experts from 13 States, as well as from United Nations entities and the International Committee for the Red Cross. The discussion contributed to identifying specific, feasible and concrete measures included in this study. While this chapter draws upon aspects of the discussion at the seminar, it is not a summary of the

meeting. It also builds upon aspects of the reports by various Special Rapporteurs of the Human Rights Council.¹

While the question posed by the Secretary-General's Advisory 4. Board on Disarmament Matters was limited to improving transparency. accountability and oversight in the use of armed UAVs, there is also widespread interest in efforts to increase transparency in the development, production, acquisition, stockpiling and transfer of armed UAVs. For example, in 2013 a Group of Governmental Experts on the continuing operation of the United Nations Register of Conventional Arms and its further development for Member States recommended that States include armed UAVs in their national reports on transfers of conventional arms.² It should also be noted that transparency in the transfer and use of armed UAVs are closely connected, especially in light of the entry into force of the Arms Trade Treaty, which establishes common international standards for exports of conventional weapon systems to prevent them, inter alia, from being used in violation of international humanitarian law and international human rights law.

I. Motivations for seeking transparency, oversight and accountability mechanisms

5. There are numerous reasons and motivations for States and civil society to seek increased transparency, oversight and accountability for the use of armed UAVs outside areas of active hostilities. A number of these motivations reflect the common interests of the international community. Others may variously reflect the particular interests of States conducting strikes, States facilitating strikes by hosting supporting infrastructure or providing other forms of support such as intelligence, States and individuals affected by strikes, and civil society. These motives can include, inter alia, the following:

¹ See especially the reports by the United Nations Special Rapporteur on extrajudicial, summary or arbitrary execution, Christof Heyns (A/68/382), and the United Nations Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism, Ben Emmerson (A/68/389).

² A/68/140, para. 69. See also chapter I.

Transparency, oversight and accountability for the use of armed unmanned aerial vehicles outside areas of active hostilities

a. Increasing mutual confidence in adherence to international law. Given the disputed issues pertaining to the application and interpretation of international law and in the propensity for UAV technology to be used in secret, increased transparency on the use of armed UAVs can be a means for Governments to demonstrate their adherence to international humanitarian law and international human rights law. Such demonstrations would be of particular importance in situations in which the legal framework applicable to the actual use of armed UAVs is likely to be contested.

b. Preventing unlawful use by others. Increased transparency on use can promote a strengthened norm of disclosure on strikes conducted by UAVs, thereby serving as a check against unlawful use by other States in operations that might otherwise have a clandestine nature. For States, the pursuit and implementation of such a norm could be a means for influencing the behaviour of others and thereby guarding against unlawful practices or the erosion of international legal standards.

c. Protecting civilians. Increased transparency on the impact of armed UAVs on civilians can contribute to humanitarian objectives by promoting greater awareness and understanding by armed forces on the effects of strikes, which can help armed forces better protect civilians, facilitate the provision of humanitarian aid and remediation to victims, and promote justice, as well as assist in improving relations between armed forces and local populations. For example, civilian casualty recording by the United Nations Assistance Mission in Afghanistan has been shown to influence the behaviour of parties to the conflict, resulting in measurable decreases to the harm caused to civilians.³

d. Promoting international peace and security. Increased transparency in the possession, deployment and use of armed UAVs can build confidence, thereby reducing the risk for the operation of UAVs to exacerbate tension and lead to an increased likelihood for conflict, particularly if such systems result in a greater likelihood for States and non-State armed groups to use force in regions of high tension.

e. Promoting democratic legitimacy of counter-terrorism operations. Increased disclosure on the use of armed UAVs and the

³ *The UN and Casualty Recording: Good practice and the need for action*, Oxford Research Group, April 2014.

legal basis of that use can serve as a means for States to promote an informed public debate on key issues affecting national security, thereby facilitating democratic oversight and ensuring support from the international community, partnering States and the public for legitimate counter-terrorism operations.

f. Assisting in the investigation of human rights violations. Disclosure of specific operational information relating to strikes can be essential in ensuring accountability and facilitating judicial processes aimed at investigating violations of the right to life and ensuring appropriate redress, remedy and reparation.

g. Facilitating the implementation of international and national export controls. Transparency on the use, acquisition and transfer of armed UAVs can provide information required by States to ensure compliance with national and international export controls, as well as end-use requirements. This could also help States prevent the diversion of armed UAVs and their components to non-State actors.

II. Transparency and accountability in targeted strikes using armed UAVs outside areas of active hostilities

Requirements under international law⁴

6. Within international law, there are a number of sources and specific requirements for transparency and accountability in the extraterritorial use of force both in situations of non-international armed conflict and outside of armed conflict.⁵

7. Within international human rights law, there is a requirement to investigate whenever death, serious injury or other grave consequences result from the use of force.⁶ To be effective, an

⁴ This section incorporates analysis prepared by Sarah Knuckey and Nathalie Weizmann.

⁵ A/HRC/14/24/Add.6, citing: Geneva Conventions, art. 1; Additional Protocol I, arts. 11, 85 (grave breaches), 87(3); Geneva Conventions I-IV, articles 50/51/130/147; and Economic and Social Council Resolution 1989/65 of 24 May 1989.

⁶ Basic Principles, art. 22; Code of Conduct, article 3 Commentary. "Human rights law imposes a duty on States to investigate alleged violations of the right to life

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investigation must be independent, impartial, expeditious and carried out with due diligence. Next-of-kin should be allowed to participate in the process and all possible steps must be taken to gather evidence. Even situations of armed conflict and occupation will "not discharge the State's duty to investigate and prosecute human rights abuses", although certain modalities of the investigation may vary according to the circumstances and practical constraints.⁷

8. Under international humanitarian law, States have a duty to investigate alleged war crimes over which they have jurisdiction—for example when they have been committed by their nationals or armed forces, or on their territory⁸—and it must make reparations for the loss or injury caused.⁹ States are also required to investigate, and if appropriate prosecute, war crimes allegedly committed on their own territory.¹⁰ Investigations should strive to meet standards of independence, impartiality, effectiveness, promptness, thoroughness and transparency.¹¹ A preliminary investigation is required in

^{&#}x27;promptly, thoroughly and effectively through independent and impartial bodies.'" Report of the Special Rapporteur, Philip Alston, on extrajudicial, summary and arbitrary executions, 2006 (United Nations document E/CN.4/2006/53) paras. 35-36 (available from http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G06/116/84/PDF/G0611684.pdf?OpenElement).

⁷ Report of the Special Rapporteur, Philip Alston, on extrajudicial, summary and arbitrary executions, 2006 (United Nations document E/CN.4/2006/53) para. 36.

⁸ See International Committee of the Red Cross (ICRC) Customary Law Study, Rule 158 (available from https://www.icrc.org/customary-ihl/eng/docs/v1_rul_rule158); United Nations document A/68/382, 13 September 2013 at para. 101 (available from http://justsecurity.org/wp-content/uploads/2013/10/UN-Special-Rapporteur-Extrajudicial-Christof-Heyns-Report-Drones.pdf).

⁹ Article 3 of Convention (IV) respecting the Laws and Customs of War on Land and its annex; article 91 of Additional Protocol I to the Geneva Conventions; article 38 of the Second Protocol to the Hague Convention.

¹⁰ First Geneva Convention, article 49; Second Geneva Convention, article 50; Third Geneva Convention, article 129; Fourth Geneva Convention, article 146.

¹¹ See for example "Report of the United Nations Fact-Finding Mission on the Gaza Conflict", A/HRC/12/48, 25 September 2009 (available from http://www2.ohchr. org/english/bodies/hrcouncil/docs/12session/A-HRC-12-48.pdf); second report of the Turkel Commission to Examine the Maritime Incident of 31 May 2010, February 2013 (available from http://www.turkel-committee.gov.il/files/newDoc3/ Summary.pdf); report of the detailed findings of the United Nations independent commission of inquiry on the 2014 Gaza conflict, A/HRC/29/CRP.4, 24 June 2015 (available from http://www.ohchr.org/Documents/HRBodies/HRCouncil/ CoIGaza/A_HRC_CRP_4.docx).

situations where a State may have only partial or circumstantial information regarding disproportionate civilian casualties when an attack has resulted in unanticipated civilian casualties or when a civilian may have inadvertently been made the object of attack.¹²

9. There are currently no coherent and overarching structures in international law for transparency in targeted strikes. Rather, norms of transparency can be drawn from various parts of the law. Some examples follow. Within international humanitarian law, States must use their best efforts to account for the dead.¹³ Article 51 of the Charter of the United Nations requires Member States to report immediately to the Security Council any measures adopted in the exercise of the right to self-defence. Article 8 (1) of the Arms Trade Treaty requires an importing State party to provide upon request relevant information, including end-use and end-user documentation, to the exporting State to assist the exporting State in conducting its national export assessment.

10. In specific reference to the use of armed UAVs, the United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions has written, "Legal and political accountability are dependent on public access to the relevant information. ... The first step towards securing human rights in this context is transparency about the use of drones. ... The various components of transparency require that the criteria for targeting and the authority that approves killings be known and that drone operations be placed in institutions that are able to disclose to the public the methods and findings of their intelligence, criteria used in selection of targets and precautions incorporated in such criteria. ... Drone victims, just as any other human rights victims, and society at large have a right to have access

¹² The United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions has written, "[w]henever there are reasons to query whether violations of international humanitarian law may have occurred in armed conflict as a result of a drone strike, such as the incorrect designation of persons as targetable or disproportionate civilian harm, accountability demands at least a preliminary investigation. Civilian casualties must be determined and should be disclosed." A/68/382, para. 101.

¹³ First Geneva Convention, articles 16-17; Second Geneva Convention, articles 19-20; Third Geneva Convention, articles 120-122; Fourth Geneva Convention, articles 129-131 and 136-139.

to information relating to allegations of human rights violations and their investigation."¹⁴

Mechanisms for increasing transparency in targeted strikes outside areas of active hostilities as a confidence-building measure

11. Transparency and confidence-building measures have been recognized as a means by which Governments can share information with the aim of creating mutual understanding and trust, reducing misperceptions and miscalculations and thereby helping both to prevent military confrontation and to foster regional and global stability. They also assist in building confidence as to the peaceful intentions of States and can help States to increase understanding, enhance clarity of intentions and create conditions for establishing a predictable strategic situation in both the areas of economics and security.¹⁵ They can also serve to demonstrate compliance with international law and universally recognized principles and contribute to the formation of new norms of international law.¹⁶ Transparency and confidence-building measures can apply both to capabilities and to behaviours.¹⁷

12. The development of transparency and confidence-building measures for armed UAVs can be effective in addressing issues resulting from the inherent technical characteristics and attributes of such systems, which make them well suited for targeted killings outside areas of active hostilities. As noted in chapter I, medium altitude long endurance UAVs can loiter for hours in uncontested airspace, performing surveillance and monitoring functions ill-suited for manned aircraft. This niche function, together with their increasing availability, relatively low cost and suitability to low-intensity conflict, gives rise to a higher risk that they could be used in unaccountable or unlawful manners, including by non-State actors. Due to these unique aspects of UAVs, there are compelling reasons

¹⁴ United Nations document A/68/382 at paras. 96-100.

¹⁵ A/68/189, para. 20. See also Official Records of the General Assembly, Fifteenth Special Session, Supplement No. 3 (A/S-15/3), para. 41.

¹⁶ A/S-15/3.

¹⁷ A/68/189, para. 21.

why they should be subject to specific mechanisms for transparency, accountability and oversight.

13. Measures for improving transparency and accountability are closely linked. With respect to allegations of unlawful harm resulting from targeted strikes, the achievement of meaningful accountability requires States to have in place appropriate measures to investigate alleged incidents, identify and prosecute responsible parties and to provide redress and relief to victims.¹⁸ It is recognized that effective accountability and oversight requires appropriate transparency, including to the public.¹⁹ For instance, reports of State investigations into suspected extralegal, arbitrary or summary executions should be made public immediately.

14. The implementation of transparency and confidence-building measures can be pursued through a variety of means, including the following: unilaterally (by States and their institutions); bilaterally (e.g., variously between a State conducting a strike, affected by a strike, supporting a strike operation or supplying an armed UAV); plurilaterally (among members of a military alliance or coalition partners); and multilaterally (either directly between States or through an international organization). Depending on the sensitivity of the information to be disclosed, different types of information can be provided to a variety of recipients, including the following, inter alia: the public; government focal points; and authorities involved in judicial proceedings. States may also have an interest in deciding on the disclosure of information and on means for its protection on a case-by-case basis.

15. The protection of sensitive operational information and intelligence sources is an important consideration in the development of any mechanism providing for increased transparency. Future efforts in this regard could consider experience and lessons learned in the implementation of article IV of Protocol V to the Convention

¹⁸ Philip Alston also asserts that to ensure meaningful accountability, States must publicly disclose such measures they have put into place with respect to investigations and to identifying and prosecuting perpetrators. A/HRC/14/24/ Add.6, para. 90.

¹⁹ A/68/382, para. 96, cites the Principles on the Effective Prevention and Investigation of Extra-legal, Arbitrary and Summary Executions, which recognize that effective accountability is dependent on transparency.

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on Certain Conventional Weapons, which requires militaries to record information on the use or abandonment of explosive ordnance during conflict and to make that information available to the United Nations and other relevant organizations after the end of the conflict. Although this reporting is designed to serve humanitarian rather than security purposes, it demonstrates how sensitive information can be collected and transmitted in a multilateral context.

16. The development of transparency and confidence-building measures is complicated by disputes regarding the interpretation of key legal concepts and the absence of a common understanding about the legal framework that applies in certain counter-terrorism operations.²⁰ While it remains essential for States to work urgently to resolve the outstanding legal issues, it is possible in the meantime to establish effective transparency and confidence-building measures. It must, however, be emphasized that voluntary mechanisms for providing transparency in UAV operations cannot have the effect of normalizing or making legitimate acts that are inherently unlawful. Rather, increased transparency could facilitate discussions by States leading to shared understandings on the interpretation and application of key legal concepts and standards.

17. The decision of a State to participate in any mechanism or to implement any transparency measure can be pursued as a matter of national policy and practice, not necessarily reflecting a sense of legal obligation. It should be recognized, however, that widely agreed policies and practices can contribute to the development of norms of behaviour and to the development of international law. They can also contribute to efforts for the further codification and progressive development of the rules of international law applicable in armed conflict, as well as to the broader efforts of States to progress towards general and complete disarmament under strict and effective international control.

²⁰ A/68/389, paras. 50-76.

III. Measures for increasing transparency, oversight and accountability pertaining to the use of armed UAVs outside areas of active hostilities

18. With respect to the use of UAVs to conduct targeted strikes outside areas of active hostilities, the following provides a non-exhaustive list of types of information that could be included within any mechanism for increasing transparency, accountability and oversight:

a. Information regarding the legal framework, national laws and policies that a State applies to specific situations in which an armed UAV may be used. This information could include interpretations of key legal terms.

b. Information regarding processes for accountability in place to ensure that a State can undertake appropriate investigation into allegations of violations to the right to life and credible allegations of war crimes. This information could be provided by States conducting and facilitating targeted strikes, as well as by States affected by them.

c. Information regarding the legal basis for each use of force, including a determination as to whether a strike conformed to applicable international law, national laws and policies and rules of engagement.

d. **Operational information for targeted strikes**, including without prejudice to national security:

- i. The location of the strike, identity and affiliation of the intended target;
- ii. Information regarding the criteria used to select targets and a description of evidence used as a basis for authorizing the use of force;
- iii. Disaggregated information on the number of casualties, including civilians;
- iv. Information on the weapon system used in the attack.
e. **Publication of the results of investigations or factfinding assessments** pertaining to allegations of violations to the right to life and credible allegations of war crimes. This information could also specify the steps taken to remedy violations, including compensation to victims, and to assist affected civilians.

19. To increase accountability and oversight for any use of UAVs to conduct targeted strikes outside areas of active hostilities resulting in credible allegations of violations of the right to life or allegations of war crimes, a mechanism could provide means for cooperation between States conducting strikes and States affected by strikes. Such cooperation could include the establishment of terms of reference, which could provide for, inter alia, adequate access to the locations of strikes for the purpose of conducting investigations as well as the provision of reparations and other forms of assistance to victims and survivors.

Increasing transparency in the development, acquisition, stockpiling and transfer of armed UAVs

20. A mechanism for increasing transparency and confidencebuilding on armed UAVs could also provide for the sharing of information related to the development, acquisition, stockpiling and transfer of armed UAVs, building upon existing international legal obligations and voluntary United Nations mechanisms, including the following:

Development and acquisition

a. Article 36 of Additional Protocol I to the 1949 Geneva Conventions requires States to determine whether the employment of new weapons would, in some or all circumstances, be prohibited under international law. A mechanism on armed UAVs could call for all States to make public their article 36 reviews on such systems.

Transfers

b. Under the United Nations Register of Conventional Arms, Member States are requested to provide data on imports and exports

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of conventional arms from their territory,²¹ including armed UAVs.²² A mechanism on armed UAVs could call for all States to ensure that they provide data on imports and exports of such systems to the United Nations Register.

c. Article 13 (3) of the Arms Trade Treaty requires its parties to submit annual reports, which are to be circulated to States parties, concerning authorized or actual exports and imports of conventional arms covered under the Treaty, which include armed UAVs. This can include the same information that is provided under the United Nations Register of Conventional Arms.

Non-diversion

d. Article 11 of the Arms Trade Treaty requires exporting States parties to seek to prevent the diversion of arms covered under the Treaty through various measures, which can include the establishment of confidence-building measures. It further requires importing, transit, trans-shipment and exporting States parties to cooperate and exchange information in order to mitigate the risk of diversion. If a State party detects diversion, it is required to take appropriate measures, which can include alerting affected States and following up through investigation and law enforcement. A mechanism on armed UAVs could establish procedures to enable States to cooperate in order to prevent, investigate or mitigate any diversion of armed UAVs.

End-use monitoring

e. In connection with the implementation of national export controls and the requirements of the Arms Trade Treaty, end-user certificates are a common method for States to ensure that their arms exports are used only in accordance with purposes specified by the exporting State. A mechanism on armed UAVs could establish common requirements for end-user certificates that could be applied to any exports of armed UAVs providing assurances on the use of the system.

²¹ A/RES/46/36 L.

²² A/RES/68/43 and A/68/140.

Holdings

f. Under the United Nations Register of Conventional Arms, Member States are also encouraged to provide voluntary information on military holdings and procurement through national production and relevant policies. A mechanism on armed UAVs could call for all States to ensure that they provide data on their holdings of such systems to the United Nations Register.

IV. Further elaboration of international mechanisms

21. Ensuring the widespread acceptance of transparency and confidence-building measures on armed UAVs would benefit from their development within a multilateral framework, and with meaningful engagement by civil society. A number of standing bodies and entities within the United Nations system could carry forward the development of such measures, including the First Committee of the General Assembly through the establishment of a group of governmental experts, the Convention on Certain Conventional Weapons or a study undertaken by the United Nations Institute for Disarmament Research (UNIDIR).

22. In consideration of various factors, including the view that armed UAVs are not inherently indiscriminate and the desirability of further examining the scope of mechanisms to ensure transparency, accountability and oversight on armed UAVs, further multilateral engagement on this matter could best be facilitated in the near-term through a study conducted under the auspices of UNIDIR with the assistance of a geographically representative group of qualified experts. In accordance with article VII.3 of the UNIDIR Statute and past practice,²³ the General Assembly could seek to provide the Institute with a suitable mandate to carry out this work.

²³ See in particular General Assembly resolutions 37/84, 38/181, 39/147, 45/62 and 59/67, which respectively addressed the following: establishment of an international disarmament fund for development; South Africa's nuclear capability; Israel's nuclear capability; economic aspects of disarmament and missiles; and missile defence.