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# CHAPTER 4

## A BRAVE IDEA: USING SOCIAL LICENCE TO REGULATE THE DEVELOPMENT OF LETHAL AUTONOMOUS WEAPON SYSTEMS

Umair Ghori and Tarisa K. Yasin

### ABSTRACT

*International humanitarian law (IHL) is struggling to catch up with military technological development. The international community is increasingly alarmed at the prospect of lethal autonomous weapon systems (LAWS) operating without a human interface. The international community's concern with autonomous enabling technology in weapon systems is whether weapon systems with the ability to identify, select, and attack military targets with little to no human control can comply with existing IHL rules and be morally and ethically acceptable.*

*This chapter explores an expanded concept of social licence to operate (SLO) to regulate the development of LAWS. The authors believe that it is more efficacious to take a preventative and precautionary approach by holding the developers accountable to IHL during the gestation period instead of following a post facto approach. The authors argue that the process involved in issuing or revoking an SLO for the developers of LAWS is already beginning to emerge in IHL. The SLO is only effective during the developmental cycle and would continue as soft law form in regulating the use of LAWS until a more concrete, treaty-based response emerges. In this sense, the SLO can be seen as a*

*catalyst towards a concerted international response to regulate the development, deployment, and use of LAWS.*

**Keywords:** Social licence to operate; autonomous weapons; international law; international humanitarian law; customary international law; institutions; institutional actors; non-institutional actors

## 1. INTRODUCTION

Law often plays catch up with technological developments. IHL, also known as the law of armed conflict, is no exception. *Protocol II* to the *Convention on Certain Conventional Weapons* (CCCW) (1998), which restricts the usage of mines and booby traps, is a better-known illustration of IHL reacting to military technological development and its adverse effects on humanity.

There have been instances where proactive steps have been adopted under IHL to ensure that the use of new military technology is restricted or prohibited (e.g. *Protocol IV* of the CCCW, 1981, prohibiting the use of blinding lasers). However, this example is the exception rather than the rule. The increasing development and use of LAWS is a more current example of law, particularly IHL, having to catch up to the rapid development of technology. LAWS is a broad expression used to describe weapon systems that possess autonomy-enabling technology which gives them the ability to perform critical functions (i.e. identify, select, and or target) with minimal human intervention. Thus, this is what is novel about LAWS and differentiates them from the more conventional or manually operated weapons ([International Committee of the Red Cross, 2016a, 2016b](#)). The concept of autonomy in the context of weapon systems should be viewed on a scale. This is because there are a variety of weapon systems that have different levels of autonomy and human-machine interactions. The [United States Department of Defense \(2012\)](#), in Directive 3000.09, created categories to assist in conceptualizing the various weapon systems with varying levels of autonomy. These categories are:

- *Semi-autonomous weapon system* – where the human operator must still select targets and initiate the attack.
- *Supervised autonomous weapon system* – where humans are still able to intervene and ‘terminate engagements’.
- *[Fully] autonomous weapon system* – where there is no need for human intervention once the weapon system is activated.

Examples of LAWS that would be considered semi-autonomous are guided munitions, like the Tomahawk (Block IV), and the MQ-9 Reaper drone. Examples of LAWS that would be considered supervised autonomous weapon systems are close-in weapon systems (CIWS) attached to naval vessels and counter-rocket, artillery, and mortar systems (C-RAMS) which are the land-based counterparts to the CIWS. There are not many examples of fully autonomous weapon systems

that are currently in use. However, loitering munitions such as the Israeli Harpy is considered a fully autonomous weapon system. Loitering munitions are different from guided munitions because they can fly according to a search pattern over a wide area seeking targets once they are launched into a general location without much need for human interaction after it has been launched. Put simply, there are various types of LAWS with wide ranging levels of autonomy. We approach the definition of LAWS under this premise.

The development and the use of LAWS present moral and ethical issues that lead to questions such as whether LAWS should use lethal force with minimal human intervention and discretion? The underlying ethical issue in this question is the issue of dignity and the right to dignity of the people who may fall victim to an attack by a weapon system (Heyns, 2016). Chris Heyns (2016) argues that ‘to allow machines to determine when and where to use force against humans is to reduce those humans to objects’ and they become zeros and ones in the algorithm programmed into the weapon system.

Furthermore, McGhee (2020) emphasizes not only the emotional toll but also the financial toll on the families of victims of drone strikes. Some examples of drone strikes creating a financial toll on families of victims include if the victim is the breadwinner of the family which could cause long-lasting instability, and or if the property of the family is destroyed. There are also psychological effects on people who live in an area where drone attacks are common such as living in constant fear for one’s safety and the safety of others.

LAWS may also not understand complex human nuances, such as religious, cultural, and moral compulsions more broadly found within norms such as mercy and compassion. It may be possible that in the future machines can be coded to understand such complex human nuances. However, at present, the area of coding religious and cultural mores into machines and autonomous robots remains a grey area.

The moral and ethical issues of the development and use of LAWS have been a critical consideration that led to the writing of this article. However, the scope of our article is more focused on the gap in IHL and International Criminal Law (ICL) that may temporarily be filled by SLO as a form of soft law and regulatory tool. The gap in IHL and ICL will be further discussed below.

We cannot ignore the fact that there are current principles and rules of IHL that apply to governing the development of LAWS, such as the fundamental principles of military necessity, distinction, and proportionality. The fundamental principles also include the prohibition on indiscriminate attacks and the prohibition on superfluous injury and unnecessary suffering. Moreover, the fundamental principles of IHL are part of customary international law which means that these principles bind any State, even though they may not be parties to the relevant treaties that are part of IHL. Examples of relevant treaties include the Geneva Conventions and its Additional Protocols and the Hague Conventions which have codified the fundamental principles of IHL. These treaties guide what States should or should not do during armed conflict as well as guide the development and use of weapons during armed conflict. However, the question is whether the existing treaty rules and principles of IHL are sufficient to govern

the development and use of LAWS? We ask this question because there are no provisions in the *Rome Statute* (the major source of ICL in this context) that establish ways to hold companies criminally liable for their actions should it lead to a breach of the *Rome Statute*.

We argue that regulation at the development phase of a weapon system is critical to controlling the fallout of LAWS and preventing future tragedies. There is little doubt that latent policy considerations, national security imperatives, or military necessities will impede effective regulation of LAWS once they are integrated into military service. The question regarding the adequacy of IHL to address the development of LAWS also reveals a gap in the current IHL and ICL regimes, that is, existing IHL and ICL rules and principles do not capture developers and companies that manufacture weapons.

In other words, companies are not directly bound by IHL and ICL. This is an important point of concern regarding companies developing LAWS. There may be instances where humans are not in control of the use of force when deploying a LAWS. In such situations, we may query who would be liable if a ‘malfunctioning’ LAWS targets innocent people, especially where the error is untraceable to a human operator? Would the developers bear liability? Or will the liability remain strictly with the military who deployed the weapon system? Will it take a tragedy to control the use and development of LAWS? Or can there be a control solution before the tragedy occurs?

We put forward an idea to answer the above questions: The SLO concept could provide a solution that can pre-emptively govern the companies that develop the LAWS before it is commissioned for use by the military. Simply put, we aim to extend the concept of SLO to cover weapon system developers. It is the weapon system developers who design and code the weapon system before handing it over to the military for use. Moreover, since weapon system developers are companies, SLO can impact them as businesses but cannot influence or control the military.

We further argue that known gaps in the current IHL and ICL regimes can potentially be filled by introducing SLO as a layer of soft regulation over the development of LAWS. Our view is that the SLO-based regulation can potentially serve to hold developers and manufacturers of LAWS to account for violations of IHL and ICL.

There is little to no analysis in academia that has debated our idea, so the original arguments we put forward may still be raw. Nevertheless, this chapter serves to propagate an original idea and to openly broadcast our views in the hopes of attracting comments and critique.

Following the introduction, Section 2 of this chapter introduces the possibility of using SLO to regulate weapon systems developers. We use elements from the institutional theory to explain the actions of institutional and non-institutional actors in the issuance, use and renewal of the SLO. We argue that the SLO as a concept can be upgraded as a regulatory tool where there is an absence of a clear regulatory framework covering the development process of LAWS. We adopt Ghori’s single- and dual-layered social licence models to explain regulatory patterns linked to SLO.

Section 3 of this chapter briefly explains the working of the single-layered SLO model by using the example of the Australian Domestic Gas Security Mechanism

(ADGSM). The ADGSM is an instrument that generates regulatory leverage over companies engaged in the extraction and export of Liquefied Natural Gas (LNG) from Australia. Our argument here is that SLO-based pre-emptive measures from the regulators (under a single-layered SLO model) convey expectations based on the leverage generated. Without that leverage, there is little effective control over the gas companies. We seek to extend the same argument to the LAWS developers.

Section 4 of this chapter presents the dual-layered SLO model for regulating weapon systems developers. The dual-layered model revolves around the non-institutional response preceding the institutional regulatory response. We cite several examples such as the *Campaign to Stop Killer Robots*, *Norges Fredslaget*, the UK-based *Article 36* and the letters of intent written by the weapons industry to their governments to show that a dual-layered regulatory scenario has begun to emerge. What is needed now is to ‘normalize’ a soft regulation SLO model that plugs the regulatory vacuum until a consensus-driven, treaty-based response materializes internationally. The conclusion of our arguments appears in Section 4.

## 2. SLO AND LAWS DEVELOPERS

### 2.1. Acquisition and Loss of the SLO

Many commentators view the SLO concept as intrinsically linked to the concept of corporate social responsibility (CSR) (Ghori, 2019; Gunningham et al., 2004, as cited in Prno & Slocombe, 2012; Joyce & Thomson, 2000, as cited in Hall et al., 2015). Both concepts are rooted in the local community in which a particular business operates. SLO can be defined as:

The acceptance or approval by local ... communities and stakeholders of a business enterprise’s operations or projects in a certain area. (Demuijink & Fasterling, 2016, p. 675)

Although the SLO is most commonly associated with the mining industry, it can apply to a wide range of industries and businesses such as banking, insurance, live exports, etc. (Demuijink & Fasterling, 2016; Ghori, 2019).

To obtain a social licence, businesses must consider stakeholders who are directly involved with the business and the communities, organizations, and people indirectly affected by their activities. Furthermore, to maintain a social licence, businesses must be responsive to the concerns and expectations of the affected community (Boele, 2018). The SLO can also be issued as a whole by other societal organs, such as governments, community groups, and the media (Prno & Slocombe, 2012). Therefore, the SLO concept is hard to straitjacket in a linear licensing regime. It is unusual for the concept of SLO to be considered as a regulatory tool since it is not a traditional form of regulation (Ghori, 2019). Nevertheless, SLO is increasingly becoming a ‘soft regulation’ method that covers the activities of companies in sectors, such as mining, trade, investment, agriculture, and livestock (Ghori, 2019; Martin & Williams, 2012; Mayes, 2015). In many instances, SLO can be said to have influenced legislative and regulative responses. For example, the Queensland Social Impact Management Plan (SIMP) requires LNG companies to invest in the local communities to maintain their social licence.

When describing SLO, Jacqueline Nelsen (2006) explains that it can be both intangible and tangible. An SLO is intangible in the sense that it is not a physical licence a business can obtain. However, an SLO is tangible in the sense that it can act as a form of insurance. If that insurance faces opposition from stakeholders, it is lost. When the SLO is lost, this can cause harm to the financial and commercial goodwill of the business (Nelsen, 2006). Thus, any business that aims to avoid such consequences must ensure that its SLO is maintained and renewed regularly. To do so, the SLO requires continuous re-evaluation and regular renewal through active negotiations and dialogue with stakeholders (Boele, 2018; Nelsen, 2006).

The mining sector provides several illustrations regarding the loss and renewal of SLOs. In 2020, major mining giants BHP and Rio Tinto received national backlash after destroying the Juukan caves in Western Australia (Allam & Wahlquist, 2020; Borello, 2020). The episode led to BHP halting the destruction of 40 other sacred Aboriginal sites (Borello, 2020). The reaction from the public indicates that BHP and Rio Tinto had briefly lost their SLO due to their reckless actions. Nevertheless, to maintain or 'renew' their SLO, BHP decided to halt any further plans to destroy other sacred sites. Rio Tinto (2020) issued an apology on their website and explained their position on the recommendations issued by the *Joint Standing Committee on Northern Australia* and their response to the Parliamentary Inquiry into the events that transpired at the Juukan Gorge. Likewise, BHP established a heritage advisory council to ensure that the local Banjima elders get a more significant say in the mining operations that may involve damage to sacred sites (Michelmore, 2020).

Even in the past, BHP Billiton has acknowledged the influence of SLO on their operations. Bice (2014) cites, for example, BHP Billiton's 2007 sustainability report which specifically acknowledges the role of SLO in the following words:

For society to grant us 'our licence to operate', we must demonstrate to our host communities and governments that we can, and will, protect the value of their environmental and social resources and that they will share in our business success.

Both examples illustrate the efforts Rio Tinto and BHP are making to regain their SLO. Both examples further show the impact of SLO in paving the way for legislative reforms which are further reflected in the recommendations of the final report of the *Joint Standing Committee on Northern Australia* issued in October 2021. According to the October 2021 report, legislative action was recommended in order to rethink the Australian legal framework's governing the protection of cultural heritage (Parliament of Australia, 2021). The *Joint Standing Committee on Northern Australia* acknowledged that Rio Tinto and the resources industry, as a whole, called for legislative modernization that can bring clarity to the framework under which the natural resources sector operates.

## 2.2. Can the SLO Model Be Extended to LAWS Developers?

Critical literature on SLO shows different approaches within the usual custodians of SLO. For example, Boutilier (2021) and Gunster and Neubauer (2019) highlight the use of SLO by the Canadian left and Australian left in resisting

infrastructure projects. While the Australian left uses a victimization narrative to show the roughshod behaviour of the mining companies, the Canadian left has used more direct action to successfully stall development projects and drive away the investors (Boutilier, 2021; Nyberg & Murray, 2020; Orland & Tuttle, 2020).

The concept of SLO has come to apply to diverse sectors such as the energy and nuclear waste management (Lehtonen et al., 2022), animal-based entertainment industries (McManus, 2022), and forestry (Pimenta et al., 2021). Through this chapter, we propose to argue that SLO can be extended to development of LAWS until a coherent, broad-based international framework on the area of LAWS emerges.

Ideally, LAWS developers should ensure they are meeting societal expectations to avoid association with activities considered unacceptable by society. The point of comparison between mining corporations and LAWS developers is that in the case of mining corporations, the views of the local communities and other stakeholders are taken on board, whereas, in the case of LAWS developers, public opinion on a more expansive international scale comes into play.

At its most extreme, it may even mean a complete prohibition on companies manufacturing weapons that are considered controversial by both local and global societal groups. Some signs of such prohibitions are observable. For example, ClearPath Robotics based in Canada recently pledged unequivocal support to pre-emptively ban LAWS. ClearPath vowed 'to not manufacture weaponised robots' that remove or do not retain meaningful human control (Campaign to Stop Killer Robots, 2020; Hennessey, 2014). Other leading artificial intelligence (AI) researchers from companies, such as Google, DeepMind, and SpaceX, have also pledged not to develop lethal robots that attack without human supervision (Future of Life Institute, n.d.; Sample, 2018).

In another example, Google in 2019 cancelled a lucrative artificial intelligence and machine learning project, known as Project Maven, in response to a threatened employee rebellion on the issue of 'business of war' (Harwell, 2018; McGhee, 2020).

Given the lethality of their products, our view is that LAWS developers should continuously seek social acceptance of their business activities in the same way as any mining corporation does to obtain, renew, and maintain their SLO. Our idea is supportable through historical precedents where CSR standards have been extended to the defence industry and have led to the creation of initiatives such as the *Defense Industry Initiative on Business Ethics and Conduct* (Halpern & Snider, 2012; Kurland, 1993; Penska & Thai, 2000).

### 2.3. Issuing SLO and the Role of Institutions and Legitimacy

Conversion of SLO into a more prescriptive regulatory standard firstly entails a holistic recognition that SLO can be a vehicle for regulating the development of LAWS. A regulatory response from States to an SLO can, for example, come in the form of legislative changes, enactment of regulatory standards, policy statements, or even a formation of an oversight body wielding regulatory powers.



The upgrade of SLO to a regulatory tool may also require a balancing exercise between institutional and non-institutional responses to the question of regulation. We use the term ‘institutional response’ to refer to regulatory responses by governments or governmental bodies. Meanwhile, non-institutional reaction refers to actions, statements, or policies adopted by non-governmental organisations (NGOs), community groups, industry associations, or environmental conservation groups.

We base our arguments on the analysis of institutions and legitimacy by W. Richard Scott. Scott’s analysis divides the socio-political legitimacy of institutions into three components: *regulative*, *normative*, and *cognitive* (Scott, 1995; Trevino et al., 2008). The regulative component comprises the existing LAWS and regulations originating from a domestic setting that promotes or discourages certain behaviours. The cognitive component is the standard general perceptions of factors that are taken for granted in society. The cognitive component of institutions reflects the structures and symbolic systems shared among individuals in a society or a nation. The normative component is the social norms, values, beliefs, and assumptions in society. Normative components of institutions define what is appropriate for the stakeholders in a societal group (Ghori, 2019; Scott, 1995).

The concept of ‘socio-political legitimacy’ has been debated by academics. It is explained as the process by which key stakeholders, the public, opinion leaders, or government officials accept a venture as appropriate, given existing norms and LAWS (Aldrich & Fiol, 1994). In the usual course, government institutions administer regulatory or legislative standards through notions of legitimacy, morality, and social norms. ‘Legitimacy’ is the normative concept that enables regulations and legislation to align with prevailing rules and cultural norms (Scott, 1995). Mark Suchman (1995) offers an alternative characterization of ‘legitimacy’ as the generalized perception or assumption that the actions of an entity are desirable within some socially constructed systems of norms, values, beliefs, and definitions. The conferral of ‘legitimacy’ occurs when:

[...] audiences affected by organisational outcomes endorse and support an organisation’s goals and activities. (Elsbach & Sutton, 1992, p. 700)

This chapter notes that the view above is not universally shared as some commentators do not separate legitimacy from SLO (Gehman et al., 2017).

The environment in which the governmental institutions perform their functions is known as the ‘institutional environment’. The institutional environment is composed of political, economic, social, and legal conventions that form the basis for production and exchange (Oxley, 1999 and Sobel, 2002 as cited in Trevino et al., 2008). The institutional environment can incorporate a societal group’s limitations and incentive systems to regulate human interactions (Trevino et al., 2008). The institutions frame rules and prescribe enforcement mechanisms that enable predictable outcomes for stakeholders (Trevino et al., 2008).

In the absence of a concrete definition, the concept of social licence seems flexible depending on the regulators’ perceptions or the local stakeholders. Usually, the mining sector illustrates a scenario where several stakeholders hold divergent

opinions. However, the development and deployment of LAWS pose a new challenge because it is unclear who can be the directly affected party.

The affected parties could be from a wide range of victims, for example, survivors of an attack by armed drones, the family members of victims, or even innocent bystanders. Another category of victims can include residents in the vicinity that develop mental disorders and health problems (McGhee, 2020; Owen, 2013).

These consequences are real outcomes because LAWS cannot understand the human concepts of mercy and compassion. They kill without suffering from any guilt afterwards and their user militaries simply dismiss the casualties from a distant land as ‘collateral damage’ (Coyne & Hall, 2018). Kouatli et al. (2020) argue that machine intelligence built into robots cannot fully discern characteristics, such as empathy, ethical dilemma, and mediation skills necessary for conflict resolution.

An added complication is the attribution of responsibility outside the battlefield because some products can be used in a ‘dual-use’ fashion, that is, for military as well as civil use. This then brings into focus the conduct of development and coding by tech companies such as Google.

Byrne (2010) argues that even where the responsibility of the use of military technology rests with the state and the military that deploys it, once companies like Google become aware of its lethal application, they should be held circumstantially responsible (McGhee, 2020).

Responses to the challenges and issues highlighted above can come from either the institutional actors (e.g. the Secretary or Minister for Defence or various government bodies) or non-institutional actors (individuals, political parties in their non-governmental capacity, interest groups, technology developers, lobbyist, NGOs, etc.). National institutions can influence diplomatic, industrial, or defence policies through the processes associated with the three components under Scott’s analysis.

Where a state’s national interests or political narrative clashes with the non-institutional behaviour of other stakeholders (as reflected by the three components), national security or social licence arguments are invoked as a justification behind a regulatory response. Here, we delineate two responses:

1. The first response is the *institutional response*. This response can lead to new legislation, guidelines or rules, and refusal of permits/licences, requiring additional compliance measures or imposition of quantitative restrictions, such as export quotas or import permit requirements. The institutional response originates from the regulative component of the institution’s sphere of influence but retains some cognitive and normative elements.
2. The second response is the *non-institutional response* led by members of the community. This response is mainly cognitive and normative. A non-institutional response is exhortative and non-binding on the parties but becomes a precursor to an institutional response.

Arguably, from an SLO perspective, a non-institutional response by stakeholders may not always be uniform or on the same level, for example, one group of

non-institutional actors may oppose a developmental project. In contrast, the other group may favour it because of potential employment opportunities or infrastructure development. Both groups of non-institutional actors may rely on cognitive and normative arguments to support their stance. Similar argument if applied to LAWS would see one group of non-institutional actors may consider the use of LAWS completely abhorrent, while some non-institutional actors on the far-right may legitimize it in the name of security.

In the context of LAWS, governments, and militaries, being part of the institutional environment, are primary interpreters of non-institutional responses emanating from the usual custodians of social licences, the non-institutional actors. Therefore, either the government and or militaries can assume an SLO on the matter of LAWS, or they can respond to the concerns and actions taken by non-institutional actors. From a national security perspective, it is difficult to determine which non-institutional actors will support a regulated use of LAWS or which ones will adopt a more exceptional position. The underlying reasons are simple: LAWS have not been deployed widely, and their repercussions are not fully evident yet. Thus, we have yet to comprehensively understand how the SLO process may work effectively in the context of regulating the development of LAWS.

#### 2.4. Overview of the Single-layered and Dual-layered SLO Models

Ghori (2019) devises two models to explain regulatory patterns linked to SLO. The two models, the single-layered regulation and dual-layered regulation, consider the observable behaviour of the institutional actors and non-institutional stakeholders. Ghori's (2019) analysis of the two models have thus far been about the Australian coal, gas, and live export sectors. This chapter attempts to extend the coverage of the model to a more non-economic context.

The more basic SLO structure (single-layer regulation) is illustrated diagrammatically in Fig. 1. The single-layered regulation occurs when the government, through its regulatory institutions, interprets the SLO positions (regarding a variety of issues such as the deployment of potentially destructive military technology, conservation of the environment, or the national interest analysis of a trade agreement).

Under the single-layered model, the government claims it acts under a social licence from the people affected by the underlying triggers/causes. Still, there may not necessarily be a trigger from a non-institutional side. The SLO assumes a stricter posture regarding appearing as a legal licence rather than a mere assent based on cognitive or normative sentiments. The single-layer regulation may appear closer to what we understand as regulation in its conventional sense. However, the single-layer regulation is distinguishable because the government overtly uses social licence as a *raison d'être* behind a governmental measure. We briefly explain this point in Section 4 of this chapter by using the example of the ADGSM.

Dual-layered regulation (illustrated in Fig. 2) occurs where the usual custodians of SLO (i.e. local community groups, lobbyists, stakeholders, trade unions, etc.)

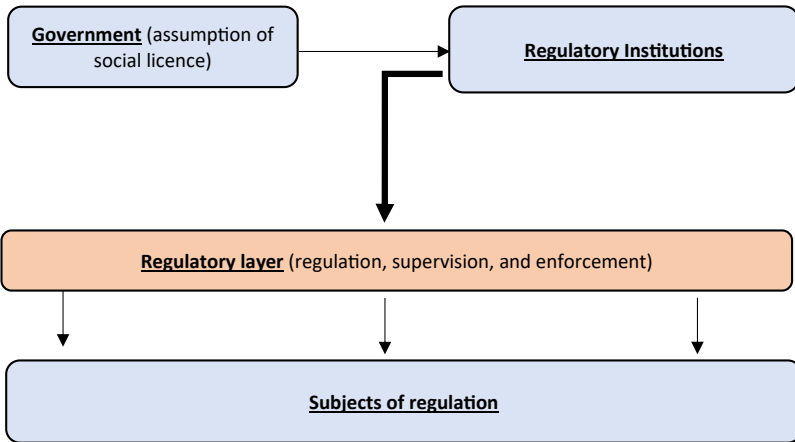


Fig. 1. Single-layered Regulation Based on Social Licence Narrative. Source: Ghori (2019).

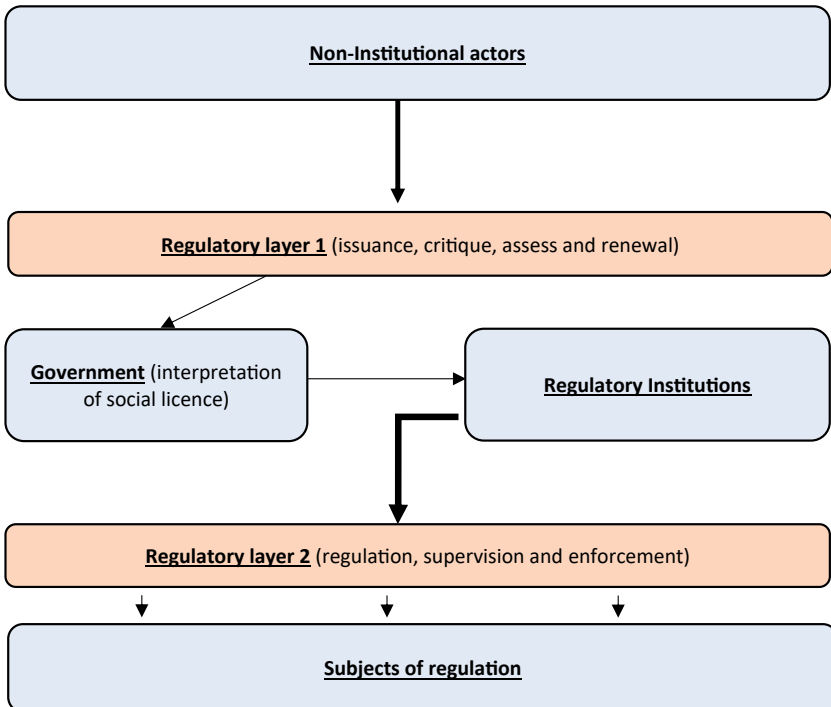


Fig. 2. Dual-layered Regulation Based on Social Licence Narrative. Source: Ghori (2019).

prompt the government to adopt regulatory measures. The regulation is justified based on SLO and continues even after the introduction of governmental regulatory measures. The regulatory response consists of both ‘soft’ and ‘hard’ forms of regulation by institutional and non-institutional actors in a dual-layered fashion.

The dual-layered model can be simply explained in two steps:

1. Non-institutional actors prompt the government to respond. Then, the institutional response comes in the form of regulation which is introduced within a defined framework of the regulatory response (e.g. legislation, rules, or guidelines) by the government.
2. The custodians of the SLO continue to critique or assess the efficacy of the regulatory response and the compliance behaviour of the target of regulatory measures.

One noticeable difference between the two models is that the institutional actors (governmental regulators) under the dual-layered regulation ‘interpret’ the SLO issued by non-institutional actors, whereas, in the single-layered model, the institutional actors assume both functions of issuance and regulation of SLO.

### **3. THE SINGLE-LAYERED SLO MODEL TO REGULATE LAWS DEVELOPERS**

The single-layered SLO model revolves around the institutional response by governmental actors or regulators. In this approach, the institutional regulator (i.e. any government department controlling the military or development and procurement of military technology) acts as the ‘source’ and the ‘interpreter’ of the social licence. The institutional actors may use a combination of regulatory, cognitive, and normative elements to encourage the subject of the regulation to comply. More specifically, in devising a single-layered model applied to LAWS, the challenge for the institutional actor is that it may be seen as regulating itself. Since militaries in most countries are influential and powerful bodies, the single-layered regulation may not work to regulate users of LAWS in the same manner as it would in cases where the government or institutional actors are attempting to rein in a mining corporation or a large gas company (Ghori, 2019).

#### *3.1. How Does the Single-layered Model Work?*

The single-layered model may work when a government (an institutional actor) assumes an SLO on issues, such as fraudulent behaviour from the defence industry and claims to act under a presumption of SLO (Ghori, 2019). Usually, the institutional response is the creation of legislative or regulatory standards that provide certainty for those affected as there are clear instructions and guidelines for them to follow (Ghori, 2019). The ADGSM is a good example. The ADGSM allows the Australian government to impose new gas restrictions on

LNG exporters to respond to domestic gas supply shortage in the eastern region of the country (Gilbert + Tobin. 2017).

The ADGSM generates regulatory leverage by using the threat of export controls on LNG exports unless the gas exporters divert a certain proportion of their production to shore up domestic gas reserves. The Explanatory Statement (Explanatory Memorandum, 2017, p. 1) describes the purpose behind the ADGSM:

[...] is to ensure that there is a sufficient supply of gas to meet the needs of Australian consumers, including households and industry, by requiring, if necessary, LNG exporters which are drawing gas from the domestic market to limit exports or find offsetting sources of new gas.

Furthermore, in introducing the ADGSM in April 2017, Malcolm Turnbull, the then Prime Minister of Australia specifically acknowledged the role of SLO:

Gas companies are aware they operate with social licence from the Australian people. They cannot expect to maintain that licence if Australians are short-changed because of excessive exports.

The statement by Prime Minister Turnbull is an interesting indication of the assumption of SLO by the Australian Government in enacting laws to protect public welfare. In doing so, the ADGSM is the direct interpretation by the government of the overall SLO owed to the people of Australia by gas companies, not just the surrounding communities.

The ADGSM provides a framework for restriction on the export of LNG where the resources minister determines there are prospects of a supply shortage in the domestic market for a particular year. Regulations 13GC(1), 13GE(1)–(3) of the *Customs (Prohibited Exports) Regulations, 1958* enables the Minister to consult other regulatory agencies such as the Australian Competition and Consumer Commission (ACCC) and other ministers such as the Minister responsible for trade, industry, and energy.

The measure of ADGSM will last for five years (until the January 2023) (Explanatory Memorandum, 2017). During this period, any controls on LNG export due to shortage means that exporters must obtain permission from the Resources Minister to continue exporting LNG (Explanatory Memorandum, 2017).

The permission may come with compliance conditions attached (*Customs (Prohibited Exports) (Operation of the Australian Domestic Gas Security Mechanism) Guidelines*, 2017). Such conditions may include annual exportable volumes of LNG after considering the expected market needs or any factors triggering a shortfall of LNG. The ADGSM includes penalties in case of non-compliance with permission conditions, including revocation of export permissions (*Customs (Prohibited Exports) Regulations, 1958*).

The ADGSM is an illustration of a single-layered SLO-based regulation. The Australian government and its underlying institutional regulators such as AEMO or ACCC act as the ‘source’ and the ‘interpreter’ of the social licence. Using a combination of regulatory, cognitive, and normative elements, the regulatory institutions encourage gas companies (the subject of regulation) to comply.

In pursuing such a regulatory strategy, the regulators convey their expectations to the LNG producers that compliance by the industry must come from their end ([Explanatory Memorandum, 2017](#)). Furthermore, the regulators interpreted that any ongoing business costs incurred due to the ADGSM constitute a part of the exporters' SLO and will be borne voluntarily by the LNG industry ([Australian Department of Industry Innovation and Science, 2017](#); [Explanatory Memorandum, 2017](#)).

### 3.2. *Single-layered Model Applied to LAWS Development*

We adopt a stance similar to the ADGSM example here. Certain aspects of the single-layered SLO approach are observable where State governments create policies regarding the development and use of LAWS. For example, at a domestic level, a State government may assume a social licence based on growing domestic and international concerns regarding the development and use of LAWS. The State government may opt to create policy and regulation on the issue and enact it to address the growing concerns. There is no pressure *per se* from non-institutional actors such as NGOs, community groups, or industry associations in this situation ([Ghori, 2019](#)).

Examples of such regulations and policies include the [United States Department of Defense \(2012\) Directive 3000.09](#) on autonomy in weapon systems. While this policy may not be directed at weapon system developers, the US Department of Defense is bound by such a directive, influencing the developmental process, and developers, by implication. In other words, weapon manufactures can be indirectly affected by the regulations outlined in *Directive 3000.09* and any other requirements and instructions received by the [United States Department of Defense \(2012\)](#).

More specifically, one of the requirements outlined in *Directive 3000.09* is that:

Autonomous and semi-autonomous weapon systems shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force. ([United States Department of Defense, 2012, 4\(a\)](#))

Therefore, the policy stance of the United States Department of Defense is to ensure the US defence force's use of LAWS complies with IHL. Nevertheless, it is wrong to assume that the single-layered SLO model can be applied across the board. States and their militaries have adopted varied approaches to developing and using LAWS. For example, the joint doctrine note by the UK Ministry of Defence (2017) illustrates another approach to regulating the development and use of LAWS. In this policy, the Ministry of Defence distinguishes between autonomous systems and automated systems. Although the joint doctrine note provides some transparency in the Ministry of Defence's approach to LAWS, there is ambiguity in what LAWS means. According to the definitions of 'autonomous weapon systems' provided in the joint doctrine note, the Ministry of Defence suggests that an autonomous weapon system is a more futuristic weapon system with the capability of 'understanding higher-level intent and direction' (Ministry of Defence, 2017, p. 13). By comparison, automated systems respond 'to inputs from one or more sensors and are programmed logically to follow a pre-defined set of rules to provide an outcome' (Ministry of Defence, 2017, pp. 42–43).

The United Kingdom's Ministry of Defence interprets autonomy differently than many others in the discussions on LAWS (Ministry of Defence, 2017, p. 13; Scharre, 2018). What the Ministry of Defence defines as automated systems, which covers much of the weapon systems used today, is what others may define as LAWS. The UK's public policy stance seems to be that they do not possess lethal, fully autonomous weapon systems and do not intend to develop or acquire them. Still, their joint doctrine note leaves open the possibility of the UK developing and acquiring LAWS in the future despite them noting that their policy is to ensure 'that the operation of UK weapons will always be under human control ...' (Ministry of Defence, 2017, p 13).

In addition to the USA and UK examples, Australia has also begun to consider its stance on the development and use of LAWS in the 2015 report titled *Use of Unmanned Air, Maritime and Land Platforms by the Australian Defence Force* ('the Senate Report') published by the Senate Standing Committees on Foreign Affairs and Defence and Trade (2015) ('the Committee'). The Senate Report discussed the various unmanned platforms currently used or tested by the Australian Defence Force (ADF), the unmanned platforms' effectiveness, the legal issues raised from submissions and hearings, the role of the weapon manufacturing industry plays and issues related to acquisition and procurement.

The background chapter of the Senate Report provides information on current unmanned platforms the ADF is using or has used in the field (Senate Standing Committees on Foreign Affairs and Defence and Trade, 2015). Based on the information provided, most of the unmanned platforms deployed are unarmed and are mainly used for intelligence, surveillance, and reconnaissance (ISR) operations, detection and disposal of explosives, and detection and disposal of naval mines (Senate Standing Committees on Foreign Affairs and Defence and Trade, 2015). However, the Royal Australian Air Force (RAAF) announced in 2015 that the RAAF personnel in the United States were trained to operate the MQ-9 Reaper (a semi-autonomous weapon system with lethal capabilities) (Blank & Noone, 2016; Scharre, 2018; Horowitz & Scharre, 2015; U.S. Air Force Air Combat Command, n.d.). According to an Australian Senate report, the RAAF personnel sent to the United States would help 'increase the ADF's understanding of complex unmanned aerial systems (UAS) operations and how this capability can be best used to protect Australian troops [in] future operations' (Senate Standing Committees on Foreign Affairs and Defence and Trade, 2015).

The Senate Report indicates that Australia can acquire LAWS. Any acquisition means a weapons review of the MQ-9, for example, by the Department of Defence or a collaboration between the Department of Defence and the weapons industry in Australia is necessary to conduct. In addition, the Committee notes in the Senate Report that there are moral and ethical issues with giving LAWS the capability to determine, on its own, whether or not to apply lethal force. However, the Committee also acknowledges that there are benefits to employing LAWS, such as increasing the accuracy of targeting military objectives, decreasing the response times, and eliminating battle fatigue. Nevertheless, the Committee's view on the use of LAWS is that 'until there is sufficient evidence that LAWS are capable of rigid adherence to the law of armed conflict, their development and



deployment should be appropriately regulated' (Senate Standing Committees on Foreign Affairs and Defence and Trade, 2015, p. 69).

The [Australian Department of Defence \(2016b, 2018\)](#) also discussed its approach to considering the use and development of unmanned platforms in its 2016 *Defence White Paper* ('the Defence White Paper') and its *Defence Industrial Capability Plan* released on 23 April 2018 ('the Defence Industrial Capability Plan'). The Defence White Paper indicates that over the next 20 years, that 'technological advances such as ... unmanned systems are likely to lead the introduction of new weapons in our region' ([Australian Department of Defence. 2016b](#), p. 2.43). The Defence White Paper also indicates the Department of Defence's priorities and plans to strengthen the ADF's capabilities, including developing and acquiring unmanned platforms and autonomous weapon systems ([Australian Department of Defence. 2016b](#), pp. 84–108). This was part of the response to the recommendations made by the Committee as the Australian government agreed in principle to the Committee's second recommendation ([Australian Government. 2016](#)). Although these documents mentioned along with other policy statements such as the *Defence Industry Policy Statement* have been published ([Australian Department of Defence. 2016a](#)), it seems to be that the Australian government is yet to create and enact regulations specific to the development and use of LAWS.

Another example that can illustrate the single-layered SLO process in action is the Netherlands. In 2013, during the UN General Assembly Committee on Disarmament and International Security meeting, the Netherlands stated that its government had begun discussions on LAWS involving the government, defence, and foreign ministries as well as civil society partners ([Cor van der Kwast, 2013](#)). In this example, the Netherlands government has assumed the SLO on LAWS to initiate domestic discussions. On 4 May 2019, the Netherlands Parliament decided to adopt a motion that called for a legally binding instrument for new weapons technology, including LAWS ([Koopmans et al., 2019](#)). In doing so, Netherlands took a major step towards adopting a formal policy and establishing regulations for LAWS. Although the Netherlands Parliament only adopted a parliamentary motion, this can spark the possibility of creating more formal regulations. The shape of the future regulatory regime remains vague, but we can surmise from such developments that there may eventually be an international code of responsible conduct for States and weapon system developers.

Institutional bodies such as the European Parliament have also passed resolutions calling for the prohibition on developing and using LAWS without meaningful human control. The resolutions further call for negotiations of an international ban on such weapon systems that lack human control over the use of force ([Committee on Foreign Affairs, 2018](#)). While not considered formal regulations on the issues of LAWS, the resolutions can be seen as a step in adopting a clear position. Adoption of a policy position can indicate a gradual development of consensus to regulate and control the use of LAWS.

The examples referred to demonstrate how various institutional actors have taken a variety of approaches in assuming an SLO on the issue of LAWS regulation. Institutional actors have acted by initiating discussions within parliament,

passing parliamentary resolutions, and taking the initial steps in developing departmental policies on LAWS.

The institutional actors frame rules and prescribe enforcement mechanisms, which in turn allow the weapons manufacturing industry to better understand the contours of regulation (Ghori, 2019). The crux of the argument under the single-layered SLO model is that the policies resulting from the institutional actor's actions and intervention will influence the development and manufacturing of LAWS. From the examples of the single-layered SLO model mentioned above, it can be concluded that any universal application of a single-layered SLO will be challenging because of the divergences in doctrine, policy, and nomenclature between States and their militaries. However, there is another way for the SLO process to work which is reflected in the dual-layered SLO model discussed below.

#### 4. THE DUAL-LAYERED SLO MODEL FOR REGULATING THE DEVELOPMENT OF LAWS

A dual-layered SLO model involves non-institutional actors influencing the institutional actors to regulate issues affecting non-institutional actors (Ghori, 2019). In this model, the non-institutional actors assume the role of 'issuer' of the SLO (typically through activism and campaigns), triggering the process illustrated in Fig. 2 and, thus, forming the first regulatory layer.

The role of the state institutions is the interpretation of those concerns and critiques expressed by non-institutional actors. The resulting policy would be considered as the second regulatory layer (Ghori, 2019, p. 64). It is important to understand that while some non-institutional actors wield significant influence, they lack the capabilities of enacting law and regulation. Hence, the role of non-institutional actors is that of a catalyst that triggers the process outlined in the dual-layered SLO model.

##### 4.1. Dual-layered Model Applied to the Development of LAWS

In the context of the weapons manufacturing industry, an example of a non-institutional actor is the Campaign to Stop Killer Robots (the 'Campaign'). The Campaign is a civil society organization that comprises a coalition of NGOs, individuals, and other organizations worldwide. The Campaign's purpose is to call for new international law on LAWS and to ensure that meaningful human control is retained over them (Campaign to Stop Killer Robots, 2021a, 2021b). As a non-institutional actor, the Campaign to Stop Killer Robots' role in this circumstance is 'controlling' the 'issuance' of social licensing.

Several non-institutional actors voiced their views on LAWS. For example, *Article 36*, a UK-based non-for-profit organization, advocated for a ban on lethal, fully autonomous armed robots (Bolton et al., 2012). *Article 36* has attempted to influence the policy on LAWS by authoring background papers that include recommendations directed to the UK Parliament (Article 36, 2013, 2016). Moreover, on 17 June 2013, the UK Parliament decided to hold an adjournment debate on

lethal autonomous robotics. In her speech, Member of Parliament Nia Griffith referenced the United Nations *Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions* (the *Report*) (Heyns, 2013). Her initial speech at the beginning of the debate indicated that the concerns raised in the *Report* warranted a discussion in parliament and the need for further international dialogue on this topic (Griffith, 2013). Thus, even other institutional actors such as the United Nations can encourage domestic debates on topics such as challenges posed by LAWS.

In Norway, Norges Fredslaget (the Norwegian Peace Association) began a public campaign calling on the Norwegian government and political parties ‘to articulate their policy’ on banning LAWS that lack human control (Campaign to Stop Killer Robots, 2013). The Campaign in Norway did have some success since on 1 March 2016, the ethics council of the Norwegian Government Pension Fund Global (the Government Pension Fund) announced that they would begin to monitor companies that are investing, or thinking of investing, in the development of LAWS (Dagenborg & Fouche, 2016). The Government Pension Fund also announced that it would consider whether investments in the development of LAWS is contrary to its ethical guidelines and investment policy. The head of the ethics panel, Johan Andresen, remarked that this should be considered a warning for those companies (Dagenborg & Fouche, 2016). Here again, we see SLO affecting an investment fund which cascades into a more significant, broader effect on government policy. On 16 June 2020 a tweet from Norges Fredslaget announced that a Norwegian government appointed agency, Regjeringen, reviewed the ethical guidelines for the Government Pension Fund and has proposed LAWS be added to the list of proscribed weapons. Therefore, The Government Pension Fund will not invest in companies developing LAWS (Association of Ethical Shareholders Germany, 2020; Campaign to Stop Killer Robots, 2021a; Norges Fredslag, 2020).

Another example is that of Belgium, where around 116 scientists working in the field of AI signed an open letter in 2017 calling on the Belgian government to prevent the proliferation of LAWS that lack meaningful human control (Members of the Belgian Artificial Intelligence and Robotics Research Community, 2017). Furthermore, the Belgian government was invited to join the efforts to preventively prohibit and to never develop LAWS. Later in July 2018, the Belgian Parliamentary Committee for Defence passed a resolution that called for the Belgian government to support efforts to ban LAWS and ensure that Belgium does not produce or use such weapon systems (Cardone, 2018).

There are other examples of non-institutional actors voicing their concerns. In November 2017, several members of the Australian and Canadian AI research community issued an open letter to their respective Prime Ministers. The letter called on the Australian and Canadian governments to support the prohibition on weaponizing AI and to make a commitment to collaborating with other States in concluding an international agreement on lethal, fully autonomous weapon systems (The Australian AI Research Community, 2017; Artificial Intelligence Research Community, 2017). However, the public have yet to see a regulatory response from either government. Here, the first layer of the dual-layered SLO model has manifested; however, the second layer is yet to materialize.

Overall, concerns raised regarding LAWS by several individuals and organizations has led to domestic and international discussions on the challenges that LAWS pose. Although there is still much work to be done in terms of more States establishing formal policy and or regulation on LAWS, one can observe the influence that non-institutional actors, and even other institutional actors like the United Nations, have on the actions that governments take. Non-institutional actors have issued critiques and concerns (first regulatory layer) that have prompted institutional actors such as State governments to consider and or adopt policy and regulations on LAWS (second regulatory layer).

However, as mentioned earlier, there are situations in which the second layer has yet to materialize in the form of tangible policy and regulations. Nevertheless, to take a preventative approach and ensure that there is a form of company liability, we argue that the SLO solution resolves the regulatory vacuum in IHL and ICL during the developmental process of LAWS. Once the LAWS are deployed, the SLO will fade into the distance if an international treaty-based framework materializes. The development of the LAWS from that point in time will be governed by a treaty framework, not the SLO.

#### *4.2. SLO and Protection of Public Interest*

The dual-layered SLO model can also aid in protecting the public interest, civilian safety, human rights, and the respect for IHL. The dual-layered SLO model can ensure that the public, including NGOs, can hold institutional actors accountable for actions that would be contradictory to the public interest and IHL. As demonstrated by the above examples, the non-institutional actors in the first regulatory layer can critique and voice concerns regarding situations, such as the issues presented by LAWS, that may be contrary to imperatives such as public interest, civilian safety, human rights, and IHL.

Based upon NGOs, other organizations, companies, and individuals who have pledged to ban LAWS or have expressed their desire for better regulation ([Human Rights Watch, 2019](#)), it is clear that it is in the public interest to continue the dialogues discussing issues presented by LAWS. It is also in the public interest and in the interest of protecting the respect for IHL, to enact and implement clear, transparent policies and regulations to ensure the proper governance of the development of LAWS.

Considering the examples mentioned earlier, one can observe how the dual-layered SLO model has helped ensure that the public interest, civilian safety, including the respect of human rights and IHL, remains at the forefront of the considerations of institutions when dealing with LAWS. However, for the dual-layered model to effectively work, the second layer needs to materialize. In other words, there needs to be a government response to the pressure from non-institutional actors in the form of enacting policies or regulations. Again, it is essential to understand that regulation of LAWS must come during the development process, not after. Once the weapons are deployed and an unfortunate human tragedy occurs, similar to the drone strike that killed 10 people, including children during the United States withdrawal from Kabul ([Stewart, 2021](#)), regulation will

not come through SLO but consensus-driven treaties under international law. In an increasingly polarized world, any consensus-based treaty regime is a distant prospect. The soft SLO-based regulation offers a quicker solution to govern the developmental phase of LAWS.

It should be re-emphasized that pressure from non-institutional actors and government responses can vary from State to State. For example, there have been non-institutional actors such as the Canadian robotics company, ClearPath, who have pledged to not design and manufacture weaponized robots. Canadian scientists have also issued an open letter calling on for a ban on LAWS that lacks human supervision to the Canadian government. However, the Canadian government has yet to enact official policies or regulations regarding the development of autonomous weapon systems. Canada has indicated its support to start multilateral talks on LAWS. In December 2019, Canadian Prime Minister Justin Trudeau asked his Foreign Minister to 'advance international efforts to ban fully autonomous weapon systems (Stauffer, 2020). Although there has been some action taken by the Canadian government on the issue of LAWS, there has been no tangible result in the form of policies and regulations (Minister of Foreign Affairs Mandate, Justin Trudeau, 2019). On the contrary, the Norwegian government, more specifically the Government Pension Fund, has responded to pressure from non-institutional actors such as the Norwegian Peace Association by implementing a policy that will monitor companies who show interest in or are investing in the development of LAWS.

## 5. CONCLUSION

Existing rules and principles of IHL may be used as a guideline in regulating the development and use of LAWS. However, these rules and principles do not provide clear instructions on how to implement them in the context of developing LAWS. Furthermore, IHL and ICL do not clearly address how companies would be held liable for operational malfunctions of the weapon systems they develop. This is of particular concern for LAWS due to the incorporation of autonomous enabling technology in the weapon systems that enable such weapon systems to perform critical functions (i.e. identify, select, and target) military objects with little to no human control. If a violation of IHL, for example, the algorithm programmed in the weapon system led that weapon system to mis-identify and target a civilian object, was to occur and liability cannot be placed on the human operator that deployed the LAWS, who then will be held liable? IHL and ICL do not clearly answer the question, especially regarding corporate liability. Thus, it would be extremely difficult to hold the company who developed the LAWS liable for the faulty algorithm. Therefore, this chapter explored the possibility of SLO, particularly the two SLO models discussed, becoming a temporary method of regulating the development of LAWS to ensure there is a form of company liability.

The single-layered and dual-layered SLO models can be seen at work in the context of regulating the development of LAWS. There have been countries that have assumed an SLO and taken steps to address the issues arising from the

development and use of LAWS and considered the potential of either banning or better regulating LAWS by passing motions, legislations, and issuing departmental policies. There have also been non-institutional actors that have lobbied and placed pressure on governments to act which, in some cases, have led to preliminary forms of regulatory response from the governments.

However, there are very few examples of institutional responses that result in formal regulation of such weapon systems in both the domestic and international context since the international community has not reached a consensus on the issue. Moreover, experts have indicated that there is currently no lethal, fully autonomous weapon systems deployed anywhere, and it may be some time before this becomes a reality (Scharre, 2018; Simon-Michel, 2014). Thus, there seems to be no evident urgency in creating and enacting regulations now.

There are still many states who have yet to issue some form of policy or regulation regarding LAWS. Taking the lack of policy into consideration, as well as the lack of transparency in some of the policies and regulations that have been issued, it is reasonable to conclude that these factors may hinder the effectiveness of both SLO models as a regulatory tool for the development of LAWS. Furthermore, if the policies and regulations issued by institutional actors are not clear and comprehensive, it would be difficult for the weapon system developer to understand the legal limit when it comes to the development of LAWS and their social responsibility in this context.

There have been calls for more transparency and a more comprehensive form of regulation for LAWS, especially ones that may lack appropriate human control, from non-institutional actors. The calls for transparency resulted in some institutional actors, including regional institutions such as the European Parliament, engaging in domestic and international dialogues on the challenges of LAWS. Furthermore, because of non-institutional actors voicing their concerns, some of these institutional actors have issued policy statements and passed parliamentary motions, or acts, that accomplish one or more of the following aspects below.

- calls for dialogue and an international agreement to be concluded;
- indicating the institutional actors, state governments in this case, stand against the development, acquisition, and the use of LAWS; or
- providing that any LAWS that a State develops or acquires will always have appropriate human control.

These policies and regulations resulting from non-institutional actors pressuring State governments to act on the issue of LAWS demonstrate the dual-layered SLO model in action. However, the government responses to pressure from non-institutional actors vary from State to State. There are some circumstances in which the second layer is yet to manifest itself but is very close to materializing, such as the previous example given of Canada's response. Therefore, it is important to note that for the dual-layered model to be effective, the second layer needs to materialize.

Another factor that may hinder the effectiveness of the dual-layered SLO model in a domestic context is that pressure from local non-institutional actors

may vary between States (Scharre, 2018). There is still much work to be done to have more State governments addressing the critiques and concerns regarding LAWS issued by non-institutional actors. Consequently, both the single-layered SLO model and the dual-layered SLO model have yet to be realized for some situations.

The effectiveness of the SLO models as a regulatory tool for weapons development is yet to have a comprehensive answer as this is an emerging topic that has not been thoroughly explored. There is still a noticeable lack of institutional response that usually precedes the issuance of policy and regulation regarding LAWS. Any policies issued to date are nascent and ambiguous at best and do not provide a clear statement of the government's intention on the development, and use, of LAWS. For weapon system developers to understand their legal and social responsibilities, government policies and regulations must be clear since this is a crucial determinant in both the single- and the dual-layered SLO model. Nevertheless, this is just the beginning of a long-term process in getting domestic and international institutions to issue comprehensive regulations on an issue that may seem futuristic but is gradually becoming relevant.

SLO has mainly been a concept discussed within the mining industry, but it can be applied to any industry or business, including the weapon manufacturing industry. The SLO models, especially the dual-layered model, can serve as a parallel form of soft law to the current treaties, customary law, and decisions from the International Court of Justice that are part of IHL.

The SLO concept can aid in addressing the lack of rules in IHL and ICL regarding commercial entities involved in manufacturing weapons which in this case are weapon system developers. Moreover, it can be a parallel form of soft law applicable in both times of peace and times of war. Further research into the potential of the two SLO models as an effective regulatory tool for LAWS development is needed because it has become necessary to address the gap in IHL and ICL regarding weapon system developers and weapon manufacturers in general.

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