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## **Drones: military weapons, surveillance or mapping tools for environmental monitoring? Advantages and challenges. A legal framework is required**

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### **Abstract**

Over the past few years the application of drones has been shifted from tradition to more modern. Drones can now be used in the fields of commerce, agriculture, environment, energy. Inevitably, such a wide spread use of drones can bring alarming concerns, such as privacy protection, security, insurance liability and accountability where drones are misused. The expansion of drones is not balanced by an exhaustive regulation. The expected result of this paper therefore is to provide possible solutions as to create and enforce new regulations, but also to understand how the present legislation can be interpreted in order to incorporate new emerging uses of the drones.

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## 1. Introduction

The word “drone” brings to mind the image of the military-grade Predator, but also all sorts and sizes of radio controlled, remotely-piloted, semi-autonomous or fully autonomous aircrafts, including hobbyist and radio controlled airplanes: a great variety of unmanned flying machines.

The pejorative “drone” is used, in regular conversation, instead of the proper “UAV” (unmanned aerial vehicle), to connote danger, given the technology’s military origins, where drones are hunter-killer robots with scary names like “Predator” and “Reaper”.

As a consequence, they are portrayed as a clear and present threat in many aspects (from privacy to property rights).

The mass use of drones is a recent progress, but they are known since the origin of airplane flight.

Orville and Wilbur Wright, before building the Flyer, worked out their ideas by testing unmanned, albeit cable-controlled, gliders [Russell (1991)]. Quickly along the history of unmanned flight, we have to mention the British military experiment held in 1914, reaching some level of success by the late 1920’s.

Another step towards new drones generation took place during the Second World War, when Germany deployed large numbers of V-1 “buzz bombs”, a sort of early cruise missiles pre-programmed for automatic flight from launch to a specific target destination [Werrell (1991)].

Thus, coming closer to present day, the first Gulf War represents another significant step in the use of drone technology. The conflict saw 522 separate drone launches and over 1,600 hours of flying time.

From that moment started an unstoppable race in the evolution and use of this instrument.

In the first phase of their use, drones were used only for target practice and training purposes, while in a second phase they were carried with surveillance electronics, and they were used for reconnaissance missions<sup>3</sup> [Takahashi (2012)]. Later generation drones, in order to perform “hunter/killer” missions, were carried both surveillance electronics and weapons<sup>4</sup>.

During Cold War operations, reconnaissance flights were a fairly common, but very dangerous mission. From 1946-1990, 23 aircraft and 179 servicemen were lost during this kind of operation [Newcome (2004)].

Although most losses from such missions were kept secret, the concerns raised by the danger of this kind of mission, and the political turmoil experienced when airmen were captured, prompted the U.S. Air Force to embark on a number of “surveillance drone” programs with companies like Radioplane, Northrop and others to produce nearly 1,500 drones.

Accordingly, the Cold War increased military’s demand for new technology and then prompted the development of drones, very useful devices both in “Space Race” between the U.S. and the Soviet Union and their nuclear arms race, as drones were used in weapons testing in the attempt to prevent pilots resulting in radiation-related illness and fatalities.

By the end of Cold War the landscape of international politics started to significantly change, and consequently also military operations changed, shifting from full-scale military operations to smaller engagements. All this laid the final groundwork for the widespread use of drones in the new millennium, used on a never before seen scale. While only five percent of military aircraft were unmanned in 2005, by 2012 UAVs accounted for one third of *all* military aircrafts [Gertler (2012)].

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<sup>3</sup> See generally RQ-4 Global Hawk, U.S. Air Force (Jan. 27, 2012), available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=13225>

<sup>4</sup> See MQ-1B Predator, U.S. Air Force (Jan. 5, 2012), available online at <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122>.

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