The use of drones for maritime surveillance and border control

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The cooperation between Frontex and the Member States of the European Union (EU) has been increasing considerably during the last years in order to enhance the situational awareness and the early response in pre-frontier areas thanks to the exchange of information.

Since 2016, there has been a huge increase of the use of drones in maritime surveillance activities by Frontex as well as a substantial investment in the evaluation of needs, the implementation of activities and the acquisition of border control technologies. Likewise, the agency signed dozens of multimillion contracts to acquire new aerial surveillance technologies.

In 2021, Frontex already signed contracts to enhance aerial surveillance amounting to a total of € 84.5 million and conducted 468 aerial surveillance flights. The purpose of these flights is to control pre-frontier areas and enhance situational awareness to prevent the migratory flows by acting as an early warning mechanism.

In parallel to this investment and deployment of drones, the EU Member States decided to cease the maritime patrols, as it happened in the case of the EUNAVFOR MED Operation Sophia. Precisely, the deployment of unmanned drones averts the obligation to rescue migrant vessels in distress at sea enacted under international law.

The EU Member States cooperate with third countries from the south of the Mediterranean which are normally migrants' place of origin or transit countries, such as Libya and Turkey. The agreements and policies implemented to contain migrants imply the interception of vessels by the coastguard of these third countries, who send back the migrants to the coast from where they have departed. In this way, the agency externalizes the actions and interventions linked to the interception and return of migrants. Therefore, the responsibility falls to these third countries, which means that other vessels cannot intervene neither disembark people rescued in an allegedly safe harbor.

Furthermore, the EU Member States have undertaken legal action and administrative barriers to prevent NGO ships from helping vessels in distress at sea. They continued to securitize their external borders, while increasing their cooperation with third countries and non-state actors to prevent migration flows. They have justified the withdrawal of the SAR capabilities arguing that these activities are a 'pull factor' for migrants to EU countries.

The investment in drones has turned into a rising trend, while Frontex's annual budget has critically increased from € 254 million in 2016 up to € 543 million in 2021, as indicated by Statista. The European drone market is expected to growth considerably and represent EUR 10 billion annually by 2035 and EUR 15 billion annually by 2050, according to SESAR. However, without visual contact, human dignity and awareness of the impact disappear. The international community must tackle the root causes of migration instead of preventing departures and managing returns. Last but not least, the paradigm of border governance must be changed towards demilitarization and human security.

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1. INTRODUCTION: THE USE OF DRONES IN PRE-FRONTIER AREAS TO DETER THE ARRIVAL OF MIGRANT VESSELS

The cooperation between Frontex and the Member States of the European Union (EU) has been increasing considerably during the last years. The aim of this partnership is to enhance the situational awareness and the early response in pre-frontier areas thanks to the exchange of information. The annual reports of the agency demonstrate the substantial investment in the evaluation of needs, the implementation of activities and the acquisition and assessment of border control technologies since 2016. This monetary allocation came along with the calls for tenders and contracts signed by Frontex to acquire new aerial surveillance technologies. Specifically, Medium Altitude Long Endurance Remotely Piloted Aircraft System (MALE RPAS) for maritime purposes. Subsequently, Frontex announced the beginning of drones' test flights over the Mediterranean in 2018. In the same way, the agency purchased Heron drones manufactured by Israel Aerospace Industries (IAI) in order to control the EU's external borders. This led to dozens of multimillion contracts signed by Frontex for the purpose of developing and fostering aerial maritime surveillance as well as monitoring migrant vessels.

In parallel to this investment and deployment of drones, the EU Member States decided to cease the maritime patrols of the EUNAVFOR MED Operation Sophia in early 2019, according to a report published by the European Parliament (Radjenovic, 2021: 5). As a matter of fact, the Operation Sophia has replaced maritime patrols with the use of long-range drones. The agency commenced to use Italian Air Force Predator drones for this mission in 2018 (Lösing, 2018). Precisely, the deployment of unmanned drones averts the obligation to rescue migrant vessels in distress at sea enacted under international law.

Furthermore, the EU Member States have undertaken legal action and administrative barriers to prevent NGO ships from helping vessels in distress at sea. They continued to securitize their external borders, while increasing their cooperation with third countries and non-state actors to prevent migration flows. Likewise, the European Parliament rejected a motion for resolution to step up Search and Rescue (SAR) operations by Member States and Frontex in the Mediterranean Sea, in October 2019. During the last six years, the Member States have been criminalizing NGOs who have tried to operate in the Mediterranean, apart from justifying the withdrawal of the SAR capabilities arguing that these activities are a 'pull factor' for migrants to EU countries (Radjenovic, 2021: 6).

The time frame of this investigation embraces the period between 2016 and 2021, as it marks the huge increase of the use of drones in maritime surveillance activities by Frontex; though it also includes some information from the previous and subsequent years. The research assesses how drones are used in pre-frontier areas to prevent migratory flows as well as how states' cooperation with third countries avoids the obligation to intervene or carry out rescue activities. It analyses the increasing cooperation between the EU Member States and other key players through the exchange of information, and it goes further by identifying the externalization of border control and the outsourced responsibility, which implies systematic violations of the international law and the in-

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ternational human rights law. The project goes into detail with regard to the replacement of vessels by drones, including data collection of the maritime aerial surveillance operations carried out with drones. It also reflects the obstacles faced by NGOs and other vessels who would be able to rescue migrants in distress at sea. What is more, it includes data regarding Frontex's budget allocation to acquire drones, public tenders and contracts signed by the agency as well as details of the on-going cooperation with other entities and the procurement plans to obtain RPAS. Lastly, it covers the budget allocated by the EU to subsidize border control activities and enhance maritime aerial surveillance through the development of different projects funded under the EU Research and Innovation programme Horizon 2020. The research ends up prompting a debate about the critical role of the international community and the necessity to change the paradigm of border governance towards demilitarization and human security.

2. EXTERNALIZATION OF THE RESPONSIBILITY

The removal of rescue boats and the increase of the utilization of drones is used by Frontex to detect and prevent migratory flows at an early stage, as migrant vessels are recognized in pre-frontier areas. In fact, the Frontex Situation Centre is a unit in charge of monitoring the external borders and the pre-frontier areas of the EU (European Parliament, 2018). The investment in drones has increased considerably in parallel with the deterrence of external rescue operations and the withdrawal of some naval missions in the Mediterranean, as it happened in the case of the Operation Sophia. Therefore, vessels that are capable of helping migrants and asylum seekers are replaced by drones that can only observe. In consequence, the agency has not the obligation to intervene neither rescue them.

The investment in drones has increased considerably in parallel with the deterrence of external rescue operations and the withdrawal of some naval missions in the Mediterranean

Moreover, the EU Member States are cooperating with third countries from the south of the Mediterranean which are normally migrants' place of origin or transit countries, such as Libya and Turkey (Radjenovic, 2021: 6). The agreements and policies implemented to contain migrants imply the interception of vessels by the coastguard of these third countries, who send back the migrants to the coast from where they have departed. That is possible thanks to the exchange of information between the parties. In this sense, the agency externalizes the actions and interventions linked to the interception and return of migrants that violate international law and international human rights. Then, the responsibility falls to these third countries, which means that other vessels cannot intervene neither disembark people rescued in an allegedly safe harbor.

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Frontex along with some EU countries have been accused of conducting pushbacks of asylum seekers and migrants to the high seas and towards Libya and Turkey. The agency launched an internal inquiry because of the accusations that involved them with pushbacks of migrants in the Aegean Sea, in October 2020 (Frontex, 2020). Concretely, there has been an increase in pushbacks from Greek territorial waters and from the islands of Rhodes, Samos and Symi. 321 incidents were reported involving 9,798 migrants between March and December of the same year (Morales, 2021: 9). Frontex's role and possible involvement in pushbacks of asylum-seekers by the Greek border guard was also questioned by

the members of the European Parliament at the end of that same year (European Parliament, 2020).

Italy has also been accused of committing pushbacks to Bosnia and Herzegovina. In particular, 22,500 pushbacks have been recorded between May 2019 and November 2020 (Morales, 2021: 9). Besides that, Cyprus has been also accused of committing pushbacks to Lebanon and Turkey, even when some of these migrants and refugees were from Syria and Palestine (ibid: 10). However, the lack of individualized assessments of their protection needs puts them on risk upon return. In total, more than 200 people arriving from Lebanon were pushed back, returned or expelled, since March 2020 and until May 2021.

3. THE SEAHORSE MEDITERRANEAN NETWORK AND THE COMMON INFORMATION-SHARING ENVIRONMENT

EU Member States are also boosting this cooperation through the Seahorse Mediterranean Network, a cooperation programme to exchange information in the Mediterranean area. This agreement was signed by Spain, Italy, France, Malta, Cyprus, Portugal and by North African countries within the European Border Surveillance System (EUROSUR) framework. It has the aim to prevent irregular migration, including trafficking in human beings and smuggling of migrants (European Commission, 2013). A relevant example alludes to the case of Libya's coastguard and it is associated with the Seahorse Mediterranean Network. This cooperation may benefit Libya in the sense of obtaining information from the EU Member States, while it fosters border monitoring and military training in the countries of origin.

This cooperative network prevents migrants from embarking on a boat with the aim of crossing the sea and avoids their unsolicited return to the countries from where they have departed, as suggested by Sabine Lösing in a parliamentary question from the 4th of December 2017 (European Parliament, 2017). This constitutes a violation of the international human rights, as the migrants may suffer or be threatened at the country of origin on arrival.

In the same year, a joint communication of the European Commission and the European External Action Service (EEAS) encouraged the involvement of North African countries in the Seashore Mediterranean Network to boost cooperation between the naval forces, the border authorities and the military of the EU Member States (European Parliament, 2020).

As a matter of fact, the second phase of the EU Emergency Trust Fund for Africa or EUTFA (T05-EUTF-NOA-LY-07), initially willing to address the root causes of irregular migration and displaced persons in Africa, has in fact the aim to support border control and management in Libya by training the Libyan Coast Guard and the Portal Security (European Commission, 2021). This and other funds embraced by the EUTFA are justified as an investment to improve migration management in countries of origin, transit and destination (ibid.).

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Going into detail, Libya's coastguard has been related to the satellite-based network and the Common Information-Sharing Environment (CISE) - an initiative of the EU to enhance the interoperability of the EU/EEA[1] Member States' surveillance systems. That means increasing the access to classified and unclassified information, which is used for the operations and missions at sea (EMSA, 2021).

The CISE program involves more than 300 EU and national authorities that are carrying out maritime surveillance activities (European Commission, 2021). EUCISE 2020 is one of the initiatives within this program that has involved 40 partners from 16 EU/EEA coastal countries with the aim of enabling information sharing across the seven key maritime sectors and user communities (ibid.).

Between 2017 and 2019, Frontex provided notices in 42 cases to the neighboring Member State's Rescue Coordination Centers, the EUNAVFOR MED and the Libyan authorities, within the framework of the Multipurpose Aerial Surveillance (MAS) activities and operations (European Parliament, 2020).

Precisely, Libya has also signed with Italy a Memorandum of Understanding (MoU) on cooperation in the fields of the fight against irregular migration, in 2017. The MoU was endorsed in the Malta Declaration in order to enhance operational cooperation with Member States. What is more, it explicitly aims to prevent departures and manage returns (European Council, 2017). As a matter of fact, Frontex has been crucial for the achievement of the MoU's objectives through its assistance projects in several African countries, including Libya and Niger.

This cooperation with Niger goes beyond the MoU, as is one of the main strategic partners of the EU in the fight against irregular migration through West Africa and constitutes one of the primary routes for Sub-Saharan migrants heading to Europe via Libya and across the Mediterranean (Moreno-Lax et al., 2021: 134). In 2018, the three-year project 'Strengthening the Africa-Frontex Intelligence Community' (SAFIC) was launched to enhance inter-agency and inter-regional information-sharing. The agency pretends to enhance border management via EUCAP Sahel Niger and the EUTFA. Indeed, Niger is among the main beneficiaries within the EUTFA, "receiving a total of €279 million for migration management and border security projects" (ibid.).

4. LEGAL OBLIGATIONS

This cooperation with the Libyan Coast Guard has implied the externalization of border control and the outsourced responsibility for systematic violations of the international law and the international human rights law. The 'pull factor' narrative disregards the complexity of forced migration and the reasons for migration. One example is the case of Turkey, who has been accused of not adhering to the non-refoulement principle, even in cases when migrants are deported to countries considered unsafe or where they could be threatened by reasons such as race, religion or nationality, inter alia. Peter Sutherland, the UN Secretary-General's Special Representative on International Migration and Development, has criticized the EU-Turkey Statement of being illegal for "deporting

1. European Economic Area

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migrants and refugees without first considering their asylum applications" (European Parliament, 2016).

According to the Article 98 'Duty to render assistance' of the UN Convention on the Law of the Sea (UNCLOS), every ship is obliged to render assistance to any person found at sea in situation of danger and to rescue persons in distress (UN, 2021: 60). However, drones cannot rescue anybody and its operations are not covered by the UNCLOS. Therefore, a person who controls a drone and witnesses a situation of migrants in distress in the Mediterranean Sea will not be bound by any international obligation of reporting or rescuing them.

Hence this interpretation of the international law includes the fact that unmanned aerial vehicles (UAV) are not bound to legal obligations regarding the aid of a vessel in distress. In consequence, the protection of human rights and the fulfillment of the principle of non-refoulement – guaranteed in the Art. 18 of the EU Charter of Fundamental Rights - are threatened as a result of the prioritization of the use of drones. What is more, these activities breach the right to asylum in accordance to the Geneva Convention of 28 July 1951 and the Protocol of 31 January 1967 as well as the Treaty on European Union and the Treaty on the Functioning of the European Union (FRA, 2021). Last but not least, the mentioned pushbacks are practices that violate the prohibition of collective and arbitrary expulsion; the principle of equality and non-discrimination; and the right to life covered under international law.

5. DRONES REPLACING VESSELS

Precisely, drones that are not obliged to conduct rescue operations are replacing vessels that are capable of rescuing migrants. Drones are being used as a tool in pre-frontier areas for border control and maritime surveillance to deter migrant vessels and prevent their arrival. Since 2016, Frontex has been investing considerably in the evaluation of needs, the implementation of activities and the acquisition and assessment of border control technologies, as indicated in the agency's annual reports.

In 2017, the MAS service was launched with the aim of supporting EU Member States and agencies to enhance situational awareness and the response in pre-frontier areas thanks to an intensified information exchange on the external borders of the Member States. In the same way, the MAS service is aimed to increase the inter-agency and Member States' cooperation.

The securitization of external borders and the cooperation with third countries came along with the calls for tenders and contracts signed by Frontex with the objective of acquiring new aerial surveillance services by means of MALE RPAS for maritime purposes. Subsequently, their operations started to include the use of drones, as proved in one of the first cases when the agency used a Heron purchased to Israeli industries in 2018 (European Parliament, 2020).

In the same year, the agency started test flights over the Mediterranean using Heron drones manufactured by IAI in order to control the EU's external borders (European Parliament, 2019), which was part of a

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100-million-euro investment allocated by the EU to Frontex with the aim of developing unmanned aircraft. Indeed, these drones were among the weapons used to fire missiles into the Palstinian people, which have killed many civilians (ibid.).

Since 2019, MAS has become a 24/7 service, as stated by Özlem Demirel (European Parliament, 2021). The purpose of these flights is to control pre-frontier areas and enhance situational awareness to prevent the migratory flows by acting as an early warning-mechanism (European Parliament, 2021: 1).

6. DOCUMENTED OPERATIONS ASSOCIATED TO THE USE OF DRONES

The following table showcases the use of drones for border control and maritime surveillance, classified according to the operations that involve or have been carried out by Frontex since 2018.

These drones have been used by the agency within the framework of its operations in order to enhance its border control capabilities and its response to the migratory flows. The Operation Poseidon is a clear example of it, which covers both the Greek sea borders with Turkey and the Greek islands.

This could also be applied to all Frontex's operations that are intended to control the EU external borders, such as the Operations Minerva - Indalo, which compresses the area stretching between Spain and Morocco, also known as the Western Mediterranean route; the Operation Themis that supports Italy in the Central Mediterranean; its Operations in the Western Balkans; or even its activities in Bulgaria and Hungary.

The use of drones to improve situational awareness and the agency's reaction capabilities at the external borders is also reflected within the framework of EUROSUR, which is an initiative to exchange information and improve cooperation between the EU Member States and Frontex.

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Table I. Specifications of the operations carried out with drones (2018-2021)

Time	Drone used	Industry	Purpose	Budget
From 2018 until May 8 2020	Heron	Israeli companies	Border control by Frontex and the European Maritime Safety Agency (EMSA)	€59 million (European Parliament, 2020)
September 2018	Heron	IAI	To control EU's external borders.	€100 million in test flights (European Parliament, 2019)
2018	Falco EVO Remotely-Piloted Air System	SELEX Galileo – Leonardo's subsidiary	Maritime surveillance for 300 hours during 180 days in 2018.

Deployed in Lampedusa for succeeding maritime surveillance operations in Italy and Malta. | €2.25 million. (Mazzeo, 2021) |
| 2018 | Heron | IAI | Test flights with drones in Italy, Greece and Portugal. | $5.5 million for 600 hours (Akkerman, 2018) |
| 2019 | Hermes 900 | Elbit Systems | To operate in the Unmanned Aerial System (UAS) (Elbit Systems, 2019).

It is a contract between EMSA and the Portuguese company CEiiA, used in cooperation with Frontex and the European Fisheries Control Agency. | €59 million (Elbit Systems, 2018) |
| 2019 | Leonardo Falco EVO drone | IAI, Israel and AIRBUS DS | Control of irregular migration in the Eastern Mediterranean Sea with the support of the Hellenic Authorities.

The 20th of June, these drones were used to control 81 migrants at the Italian coast (Leonardo, 2019) | €6.4 million (TED Europa, 2018) |
| 2019 | Tekever AR5 Evo (EMSA, 2018) | The REACT consortium (Tekever/ Collecte Localisation Service). | Maritime surveillance in Portugal. 136 flight hours (EMSA, 2021) | €1.7 million (Monroy, 2021) |
| 2019 | Heron 1 and Falco Evo | IAI and Leonardo | Maritime surveillance in Greece. 143 flight hours of pre-operational (EMSA, 2021) | €2.5 million (Monroy, 2020) |
| 2020 | IAI Heron 1 and Hermes 900 drone | Conglomerate Airbus Defence and Space Airborne Solutions, and IAI / Elbit Systems | Aerial maritime surveillance in Greece, Italy and Malta (European Parliament, 2020)

The drones were supposed to operate in the Eastern and Central Mediterranean Sea, within a radius of up to 250 nautical miles and with the aim of monitoring the pre-frontier areas of interest to Eurosur, including the coast of Libya, Tunisia and Egypt (Burt and Frew, 2020) | €100 million (Martiny, 2020) |
| 2020 | Elbit Hermes 900 | Portuguese company CEiiA – with the collaboration of ELBIT | Maritime surveillance in Greece (European Parliament, 2020) | €59 million (TED Europa, 2018) |
| 29 April and May 2021 (European Parliament, 2021) | Heron | IAI and Airbus Defence and Space Airborne Solutions (ADAS) | Frontex started operating its MALE RPAS IAI Heron from Malta International Airport (Scramble Dutch Aviation Society, 2021) | €100 million (Scramble Dutch Aviation Society, 2021) |

Source: Author's own, using references shown

6.1 BRIEFLY DESCRIPTION OF THE DRONES USED BY FRONTEX IN ITS OPERATIONS

Heron

The Heron is a MALE UAV system used for strategic reconnaissance, surveillance operations and tactical missions. It is capable of conducting operations of up to 45 hours duration, at up to 35,000 ft. (IAI, 2021)

Falco EVO Remotely-Piloted Air System

The Falco EVO is an unmanned surveillance vehicle with a wide range of multispectral sensors, which allows a reliable real time stand-off, target detection, classification, identification and shadowing (Leonardo, 2021)

Hermes 900

The Hermes 900 is a multi-role MALE UAV with multi-mission and multi-payload capabilities. It has a class-leading payload carrying capacity of 350kg. It is capable of performing missions for area dominance and persistent ISTAR - intelligence, surveillance, target acquisition and reconnaissance (Elbit Systems, 2021).

Schiebel Camcopter S-100 UAS

The Schiebel Camcopter S-100 UAS is an UAV devoted to military and civilian applications. The Vertical Takeoff and Landing (VTOL) UAS does not need a prepared area or supporting launch neither recovery equipment. It can operate during both day and night as well as under adverse weather conditions. It has a range out to 200 km on land and at sea. It can navigate automatically via pre-programmed GPS waypoints or can be operated with a pilot control unit (Schiebel, 2021)

Tekever AR5

Is a medium-altitude, medium-endurance fixed wing UAS used for maritime surveillance operations with a high capability and increased endurance, while it reduces the operating costs. It includes Beyond Line-Of-Sight (BLoS) satellite communications, high precision video, imagery and sensor data in real-time.

It can be used for wide area surveillance and for near shore and maritime missions; it has an onboard multi-sensor pattern detection; it combines use of Line-Of-Sight and BLoS datalinks to maximize its performance; and it has an endurance of 20 flight hours (Tekever, 2021).

Wingo OGASSA OGS42

Is the latest generation of UAVision Unmanned Air Systems, especially designed for long endurance maritime operations. Specifically, it has an endurance up to 10 flight hours, it can be used multiple scenarios and missions, and it can include different types of payloads (UAVISION, 2021).

Indago 3

The Lockheed Martin Procerus Technologies Indago VTOL small UAS is rapidly deployable and has high resolution payload options. It has an endurance of 50-70 minutes and provides tactical situational awareness for military and government customers (Lockheed Martin, 2021).

7. THE OBSTACLES FOR NGOS AND OTHER VESSELS WHO WISH TO CONDUCT SAR ACTIVITIES IN THE MEDITERRANEAN

Since 2016, the EU Member States started to criticize the work of civil society actors in the Central Mediterranean and Aegean (Moreno-Lax et al., 2021: 95), as it happened for instance with Mare Liberum in Germany or Mare Jonio in Italy (Mare Liberum, 2020). NGO ships and crew involved in SAR operations have faced over 50 criminal prosecutions, administrative proceedings, and health and safety sanctions – after being accused of carrying more passengers than they were authorized for (ibid.). Germany, Greece, Italy, Malta, the Netherlands and Spain have initiated these actions in order to deter migrants from arriving to Europe (Morales, 2021: 16).

Italy and Malta have been accused of preventing repeatedly NGOs and other vessels that were conducting SAR activities in the Mediterranean "from disembarking the people they had rescued at sea in their ports" (Radjenovic, 2021: 5). Furthermore, the EU Member States decided to cease the maritime patrols of EUNAVFOR MED Operation Sophia in 2019; though this patrolling saved tens of thousands of lives, as stated by the European Parliament. Similarly, a stand-off between the Member States led to a policy of forcing migrants to stay several days or even weeks on boats as well as to legal action and administrative barriers to prevent NGOs' ships from operating at sea. Likewise, the European Parliament refused a motion for resolution "to step up SAR operations by Member States and Frontex in the Mediterranean Sea".

Over the last six years, the EU and its Member States "have withdrawn SAR capabilities in the Mediterranean" and some EU countries have criminalized NGOs who tried to conduct sea and rescue operations. This has been justified arguing that SAR operations constitute "a pull factor for migrants to the EU". In fact, Frontex was accused of being involved in pushbacks of migrants in the Aegean Sea which derived into an internal inquiry, and for the "alleged involvement of Frontex staff in pushbacks of asylum-seekers by the Greek border guard" (ibid: 7). Nonetheless, it is very difficult to make the agency accountable for these acts.

8. FRONTEX'S INCREASING INVESTMENT IN RPAS AND EU'S BUDGET FOR BORDER CONTROL

The agency has been increasingly expending the greater part of its budget for the purpose of acquiring more drones to control and deter migratory flows as well as to enhance its response capability. This could be demonstrated with the agency's expenditure over the years. Specifically, since 2016 when Frontex started to invest considerably in the development and implementation of activities related to the use of drones for border control. This can be displayed through the classification in the Table II within the annexes that shows the budget allocated by the agency for these activities.

In the path towards acquiring these new technologies for maritime surveillance and border control, Frontex has been looking for drones' suppliers and signing contracts with specialized companies. The list

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that appears on the Table III includes the contracts signed by Frontex to obtain RPAS. Frontex and EMSA have strengthen inter-agency and European cooperation in terms of coast guard functions and border control, while supporting the national authorities (Frontex, 2019). The public tenders endorsed by Frontex and EMSA to obtain RPAS have constantly increased since 2016. The contracts indicated in the Table IV have been signed since the mentioned year up to 2021.

Moreover, there are several on-going procurement plans to obtain RPAS. In 2020, Frontex implemented a technology pilot project, including small MALE RPAS and VTOL for land and coastal border surveillance, with an estimated value of €3.76 million. This plan was included on the budget for procurement activities for 2020, which amount to €243.0545 million, in line with the article 72.3 (b) of the Frontex Financial Regulation adopted by Frontex Management Board Decision 19/2019 of 23 July 2019 (Frontex, 2019: 95). The agency has not ceased its commitment towards obtaining more RPAS and it has already developed new procurement plans for the upcoming years, which are exposed in the Table V.

Furthermore, the EU Member States have been contributing to upgrade the control of its external borders through different projects devoted to that purpose and funded under the EU Research and Innovation programme Horizon 2020. The Table VI includes all these projects focused on the enhancement of maritime surveillance, which have the end goal of preventing the arrival of migrants and refugees to the EU.

9. FINAL CONCLUSIONS

Monitoring operations have replaced rescue activities in order to deter irregular migration through the enhanced cooperation with third and transit countries; while NGOs face several obstacles to help migrants and refugees. The power, authority and capacity to act lie in the hands of the EU Member States and Frontex; while NGOs are prosecuted and human rights neglected.

As long as Frontex continue to use drones for maritime surveillance instead of vessels, the lives of migrants are at risk. In fact, the number of people detected by the agency is large. A total of 16,732 migrants were detected just in 2019, of which 15,433 were spotted by Frontex surveillance in Central and Eastern Mediterranean Sea (Frontex, 2021: 13). However, you need agents and vessels at sea to rescue all these people. Without visual contact, human dignity and awareness of the impact disappear.

In 2021, Frontex already signed contracts to enhance aerial surveillance amounting to a total of €84.5 million and the agency's procurement plans are significant and extensive. In the same year, the agency conducted 468 aerial surveillance flights (Frontex, 2021: 5). At the same time, its engagement in returns has been "stronger than ever before, with a record number of over 18000 non-EU nationals returned to 102 destination countries" during 2020 (ibid: 15). The investment in drones has turned into a rising trend, while Frontex's annual budget has critically increased from €254 million in 2016 up to €543 million in 2021 (Statista, 2021). In parallel, the European drone market is expected to growth considerably

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and represent €10 billion annually by 2035 and €15 billion annually by 2050 (SESAR, 2016: 3). What is more, artificial intelligence is now at the heart of the debate, which encompasses technological systems that can perform specific tasks autonomously with human-like capabilities when programmed to do so.

The widespread pushback policies and practices as well as the advanced surveillance and deterrence equipment imply a threat and a risk to the life of migrants and a discriminatory treatment. Notwithstanding the fact that Frontex has been accused of not acting in compliance with human rights in the framework of its operations, the agency has limited accountability mechanisms.

The international community must tackle the root causes of migration instead of preventing departures and managing returns. The EU Member States should change the paradigm of border governance and cease to invest in military drones, which can even carry heavy payloads. The efforts should be addressed to reduce defense expenditure and call for the demilitarization of border surveillance with the end goal of improving human security and protecting human rights.

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11. ANNEXES

Table 2. Frontex's budget allocation for drones by activities (2016-2020)

Year	Activities
2016	**Expenditure in 'Audit and evaluation needs; RPAS needs in RDU'** = 770.000 EUR[2]
2017	**Assessment of Border Control Technologies** - larger size long endurance RPAS in Eastern Mediterranean Sea region.[3] **Technology Assessment and Acquisition** - ICAO Second Global Remotely Piloted Aircraft Systems Symposium.[4] Commitments: 6,651,082 EUR[5] Payments (2017): 184,036 EUR Expected payments (2018): 6,467,046 EUR
2018	**Surveillance and communication services** - Integration of RPAS data into a maritime picture (IMS, Eurosur, Fusion Sevices).[6] Enlargement of Frontex Fixed-Wing Aircraft (FWA) services and EMSA RPAS services for multipurpose operations. EMSA provided mid-size fixed wing RPAS services over Portuguese waters to FRONTEX with a payload configuration composed of optical and infrared cameras, a maritime radar, AIS and distress signal receiver. **Capacity sharing** - Sharing information about existing and planned sea and air surveillance possibilities as well as providing a database accessible to the agencies. Cooperation with EFCA in the use of Frontex's RPAS pilot.[7] **Research and Innovation: technology assessment** - Testing, trials and demonstrations of technologies and solutions for border control: trial of MALE RPAS for long endurance Maritime Aerial Surveillance; and maritime analysis tools pilot trial.[8]
2019	**Surveillance and communication services** - Frontex supported the European Fisheries Control Agency (EFCA) via multipurpose aerial surveillance during MMO Black Sea operation in May 2019 and Baltic Sea Region Border Control Cooperation (BSRBCC) in Denmark at the beginning of June. During MAS missions, 149 sightings were reported to EFCA in the same year.[9] **Capacity sharing** - Cooperation with EFCA in the use of Frontex's RPAS pilot. Frontex and EFCA have set operational contacts and enhance their exchange of information in connection with EFCA offshore patrol vessel operational activity.[10] **Research and Innovation: technology** - Testing and evaluation of the small MALE RPAS pilot project in the Central Mediterranean Sea; facilitating the dialogue with the industry in terms of innovative technical solutions relevant for border control.[11] **Cooperation activities** - Support on the development of the procurement for RPAS and Frontex aerial surveillance system; participation in external meetings and conferences to address technology issues relevant for border control and coast guard functions; technical support to the activities of the European Commission, EU agencies, Member States and third countries.[12] **Inter-institutional framework contract for aerial surveillance for border control and coast guard function services for Frontex/EFCA** - Expenditure: EUR 27 million.[13]
2020	**Research and innovation activities** - Frontex has been focused on participating in the development of research and innovation activities for border control, including the use of advanced surveillance technology. It has also been assisting the European Commission in the response to the operational needs for an advance protection of the EU external borders. Experts from the agency participated in research projects related to border security within the framework of Horizon 2020.[14] **Second aerostat pilot project for maritime surveillance** - This project aims to provide innovative solutions and propose a cost-effective, reliable and green solution for maritime surveillance.[15]

Source: Author's own, using references shown

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Table 3. Frontex contracts and public tenders to obtain RPAS (2014–2021)

Year	Contracts and public tenders	Expenditure	Additional information
2014	**Poland-Warsaw: Pilot project on purchasing of aerial surveillance service for Frontex coordinated operational activities**[16]	Value, excluding VAT: € 270,000	Contract No: Frontex/OP/470/2013/JL. Contractor: Diamond-Executive Aviation
2015	**Poland-Warsaw: Framework contract for aerial surveillance services assets and expert support**[17]	Value, excluding VAT: €10 million	Contract No: Frontex/OP/166/2015/JL. Contractors: CAE Aviation, EASP Air BV, Indra Sistemas SA, Diamond-Executive Aviation Ltd, Défense Conseil International, Vigilance BV, SIA
2016	**Poland-Warsaw: Medium Altitude Long Endurance RPAS deployment for maritime surveillance**[18]	Value: €4.75 million	Contractor: Israel Aerospace Industries
2016	**Trial of RPAS for maritime aerial surveillance.**[19]	Value excluding VAT: €101.5 million	Tender Reference Number: Frontex/OP/694/2016/JL. With the aim to acquire 8 blocks of 100 hours each of maritime border surveillance services. This service was expected to be carried out with a MALE RPAS in the Mediterranean Sea.
	RPAS maritime aerial surveillance services trial.[20] [21]	Value excluding VAT: €2.5 million	Tender Reference Number: Frontex/OP/496/2016/JL The agency wanted to deploy RPAS in the Mediterranean Sea, requesting a service that included the provision of RPAS platform, payload, communication equipment, experts and operational support.
2017	**Poland-Warsaw: Trial of remotely piloted aircraft system for long endurance maritime aerial surveillance**[22]	Value excluding VAT: €7 million	Tender Reference Number: Frontex/OP/800/2017/JL.
	Trial of RPAS for long endurance maritime aerial surveillance, including the trial of both MALE and small MALE.[23] [24]	Total value of the procurement (excluding VAT): €6.4 million	Tender Reference Number: Frontex/OP/800/2017/JL – signed with a consortium between IAI, Israel and AIRBUS DS - Airbus (DE), IAI (ISR), Heron 1, €4.75 million - Leonardo (ITA), Leonardo, Falco Evo, €1.7 million It has the aim to fly up to 600 and 300 hours respectively, over a period of 120 days in 2018. The trials will take place in the Eastern Mediterranean Sea in cooperation with so me EU Member States and with the support of the Hellenic Authorities. The payload on board the RPAS included a radar, AIS and a camera, which was used in the Joint Operation Poseidon.
2018	**Poland-Warsaw: Framework Contract for Aerial Surveillance Services Assets and Expert Support Lot 1**[25]	Value excluding VAT: €14.5 million	Contract No: Frontex/OP/166/2015/JL
	Poland-Warsaw: Maritime analysis tools[26]	Value excluding VAT: €783,000	Tender Reference Number: Frontex/RP/1187/2017/AH
	EMSA - Portugal-Lisbon: Contract for long endurance and long range RPAS[27]	Value excluding VAT: €59 million	Tender Reference Number: EMSA/OP/1/2018
	Poland-Warsaw: Trial of Remotely Piloted Aircraft System for long endurance Maritime Aerial Surveillance[28]	Value excluding VAT: €6.4 million	Tender Reference Number: Frontex/OP/800/2017/JL
	Aerial Surveillance Services for Border & Coast Guard Function[29]	Value excluding VAT: €27 million	Tender Reference Number: Frontex/OP/104/2018/JL/MS
	Aerial Surveillance Services for Border & Coast Guard Function[30] [31]	Total: €38 million	The aim of this tender is to enable Frontex and EFCA to dispose of aerial surveillance equipment with high deployability to cover their requirements for operations of maritime aerial surveillance. Tender Reference Number: Frontex/OP/932/2018/JL/MS For Mid-Range and Long-Range surveillance flights. Contractors: - CAE Aviation / DEA Aviation Ltd / Airborne Technologies GmbH/ Fly4Less Kft: €2.25 million - CAE Aviation / DEA Aviation Ltd / EASP Air BV: €6.05 million - CAE Aviation / DEA Aviation Ltd / EASP Air BV: €7.2 million - CAE Aviation / DEA Aviation Ltd / EASP Air BV: €13.5 million - Aerial and related services: value excluding VAT: €9 million

Year	Contracts and public tenders	Expenditure	Additional information
2019	Poland-Warsaw: Remotely Piloted Aircraft Systems for Medium Altitude Long Endurance Maritime Aerial Surveillance[32]	Value excluding VAT: €50 million	Tender Reference Number: FRONTEX/ OP/888/2019/JL/CG
	RPAS for Medium Altitude Long Endurance Maritime Aerial Surveillance[33]	€50 million	Tender Reference Number: FRONTEX/OP/888/2019/JL/CG Total value of the procurement (excluding VAT): Contractors: Airbus, IAI, Heron 1; U-TACS, Elbit, Hermes 900 Operations to be conducted in Greece, Italy and/or in Malta, including reliable close to real time live data streaming and data sharing capacity.
2020	Poland-Warsaw: Remotely Piloted Aircraft Systems for Medium Altitude Long Endurance Maritime Aerial Surveillance[34]	Value excluding VAT: €50 million	Tender Reference Number: Frontex/OP/888/2019/JL/CG
	Poland-Warsaw: Frontex Surveillance Aircraft Services for Border and Coast Guard Functions (FSA I)[35]	Value excluding VAT: €101.5 million	Tender Reference Number: Frontex/OP/694/2020/JL/MS
	Maritime Surveillance Aerostat two Technology Pilot[36]	Estimated total value: €3.01 million	Tender Reference Number: Frontex/OP/612/2020/JL
	Purchase of Drones and Payloads[37]	Estimated total value: €2 million	Tender Reference Number: Frontex/OP/884/2020/JL
2021	Poland-Warsaw: Frontex Surveillance Aircraft Services for Border and Coast Guard Functions (FSA I)[38]	Value excluding VAT: €53.6 million	Contract No: Frontex/OP/694/2020/JL/MS Contractors: DEA Aviation; EASP Air BV; 2. Scotty Group Austria GmbH; 2Excel Aviation Ltd
	Poland-Warsaw: Frontex Surveillance Aircraft Services for Border and Coast Guard Functions (FSA I)[39]	Value excluding VAT: €30.9 million	Contract No: Frontex/OP/694/2020/JL/MS Contractors: DEA Aviation; ASP Air BV; 2. Scotty Group Austria GmbH; 2Excel Aviation Ltd; ISR Support Europe BV

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35. TED Europa "Contract for surveillance aircraft services for border and coast guard functions". https://ted.europa.eu/udl?uri=TED:NOTICE:541960-2020:TEXT:EN:HTML
36. TED Europa "Maritime Surveillance Aerostat two Technology Pilot". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=7148
37. TED Europa "Purchase of Drones and Payloads". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=7547
38. TED Europa "Contract for surveillance aircraft services for border and coast guard functions". https://ted.europa.eu/udl?uri=TED:NOTICE:395424-2021:TEXT:EN:HTML
39. TED Europa "Contract for aerial surveillance services for border and coast guard functions". https://ted.europa.eu/udl?uri=TED:NOTICE:395423-2021:TEXT:EN:HTML

Table 4. Frontex and EMSA cooperation to obtain RPAS (2016-2021)

Year	Contracts	Additional information
2016	Procurement procedure. Contracts for RPAS services in support of the execution of Coast Guard functions.[40]	Tender Reference Number: EMSA/OP/12/2016 Operator: REACT consortium of TEKEVER and CLS / RPASGUARD consortium of Portuguese Air Force, UAVision, Deimos Aircraft manufacturer: TEKEVER / UAVision Aircraft type: AR5 evolution / Wingo Ogassa
2018	Lightweight RPAS to support operations from vessels.[41]	Tender Reference Number: EMSA/OP/12/2018
	Contracts for RPAS VTOL Services for Emissions Monitoring and Maritime Surveillance.[42]	Tender Reference Number: EMSA/OP/10/2018 Operator: Schiebel Aircraft manuf acturer: Schiebel Aircraft type: S100
	Provision of SATCOM services for RPAS[43]	Tender Reference Number: EMSA/OP/2/2018
	Contract for long endurance and long range RPAS[44]	Tender Reference Number: EMSA/OP/1/2018 Operator: CEiiA Aircraft Manufacturer: Elbit Aircraft type: Hermes – 900 It aims to provide RPAS to support the Coast Guard Function, which should have a high level of deployability and availability in order to provide operational capability and additional data streams to the EU Member States, Iceland, Norway, the European Commission, the EU Agencies and to governmental organizations. In 2020, one of the Hermes 900 crashed in Crete during the take-off,[45] which was included in a package estimated at €59 million within this public tender[46]
2020	RPAS Services for Multipurpose Maritime Surveillance[47]	Tender Reference Number: EMSA/OP/27/2020 Estimated total value: €50 million RPAS for Maritime Surveillance in Open Sea Areas with Long Endurance and Long Range that will be used on maritime geographical areas with common operational interests for the Member States or the EU operations, involving EFCA and Frontex.
	SurvSeaNet Web Application: Live Video Streaming and Sensor Data Geolocation for Mission Control of Remotely Piloted Aerial Systems (RPAS/UAV/UAS)[48]	Tender Reference Number: EMSA/OP/14/2020 Estimated total value: €1.83 million It provides a service to follow up in real-time the flight of an RPAS in an operation of maritime surveillance. The service has a web-based user interface to live stream the video from the RPAS cameras and map the position and sensor data on a GIS map.
	RPAS Services for maritime surveillance with extended coastal range[49]	Tender Reference Number: EMSA/OP/46/2020 Estimated total value: €20 million RPAS services for maritime surveillance operations and coast guard functions, to enhance an integrated and real time maritime operational awareness picture.
2021	Lightweight RPAS Services Supporting Pollution Response and Multipurpose Maritime Surveillance[50]	Tender Reference Number: EMSA/OP/1/2021 Estimated total value: €7 million

Source: Author's own, using references shown

40. EMSA (European Maritime Safety Agency). "Contract for RPAS services for coast board functions". http://www.emsa.europa.eu/tender-archives/current/download/4401/2773/23.htmlhttps://cdn.netzpolitik.org/wp-upload/2019/12/E-2946_191_Finalised_reply_Annex1_EN_V1.pdf

41. TED Europa "Lightweight RPAS to support operations from vessels". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=3725

42. TED Europa "Contract for RPAS VTOL services". https://cdn.netzpolitik.org/wp-upload/2019/12/E-2946_191_Finalised_reply_Annex1_EN_V1.pdf

43. TED Europa "Provision of SATCOM services for RPAS". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=3404

44. TED Europa. "Contract for long endurance and long range RPAS". https://cdn.netzpolitik.org/wp-upload/2019/12/E-2946_191_Finalised_reply_Annex1_EN_V1.pdf

45. MONROY, M. (2020). "Investment of 2.5 million euros for maritime surveillance in Greece". Against Migration: EU drone crashed in Crete. https://digit.site36.net/2020/01/31/against-migration-eu-drone-crashed-in-crete/

46. TED Europa. Portugal-Lisbon: Contract for long endurance and long range RPAS. https://ted.europa.eu/udl?uri=TED:NOTICE:116450-2018:TEXT:EN:HTML

47. TED Europa "RPAS Services for Multipurpose Maritime Surveillance". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=7486

48. TED Europa. "SurvSeaNet Web Application: Live Video Streaming and Sensor Data Geolocation for Mission Control of Remotely Piloted Aerial Systems". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=6903

49. TED Europa "RPAS Services for Maritime Surveillance with Extended Coastal Range". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=7647

50. TED Europa "Lightweight RPAS Services Supporting Pollution Response and Multipurpose Maritime Surveillance". https://etendering.ted.europa.eu/cft/cft-display.html?cftId=8242

Table 5. On-going procurement plans to obtain RPAS

Procurement Plan - Adopting Amendment N1 to the Programming Document 2019-2021[51]	Provision of Aerial surveillance capacity by MALE RPAS. Frontex aimed to acquire a defined number of flying hours of MALE RPAS to carry out multi-purpose aerial surveillance activities. Estimated value in: €8 million
Project D: Strengthen sharing of data from surveillance assets between EFCA, Frontex and EMSA (2020-2021)[52]	Sharing manned aircraft/RPAS and other video streams/data centre capabilities among Agencies and with Member States aerial operations.
Strategic action areas (Annual work programme 2021)[53]	Management of innovation projects with a special focus on surveillance and the integration of data obtained from the RPAS and aerostats.
Research, innovation and good practice exchange[54]	Border surveillance and monitoring, including the application of RPAS, aerostats and other tools.
Multiannual Plan 2021-2023 & Procurement Plans (Aerial Surveillance / RPAS)[55]	Single Programming Document 2021-2023, including the Multiannual Plan 2021-2023, the Programme of Work 2021 and the Budget 2021. Procurement Plan 2021: the total envelope foreseen for procurement activities for 2021 amounts to €477.02 million The following procurements, services and goods are included in this budget: **- Framework contract for the purchase of drones and related training for drone operations.** Drones (medium size) for border surveillance. **- Framework contract for the purchase of drone tethering stations and parachutes.** New technological solutions to enhance and expand the usage of purchased medium-size drones for border surveillance. **- Framework contract for purchasing of drone Indago 3 system and payloads.** Drone, payloads, battery charges, repair, maintenance and training for the users - usually 2 pilots. **- Small MALE RPAS technology pilot testing for land / coastal surveillance in order to try over a period of 600 hours of service.** The purpose is to increase Frontex and the EU Member States awareness on available technologies and innovation in border security and the added value of the use of small MALE RPAS for border surveillance. This pilot will complement the pilot on VTOL planned to be implemented in 2021. In fact, the procurement can only be implemented if additional budget is available the latest by the second quarter of 2021. **- VITOL RPAS technology pilot project testing for land / coastal surveillance to try over a period of 300 hours of service.** It also aims to increase Frontex and EU Member States awareness on available technologies and innovation in border security.

Source: Author's own, using references shown

51. Frontex. "Provision of aerial surveillance capacity by MALE RPAS, estimated in 8,000,000 euros". (pg. 14). https://frontex.europa.eu/assets/Key_Documents/MB_Decision/2019/MB_Decision_8_2019_adopting_amendment_N1_to_the_Programming_Document_2019_2021.pdf
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53. Frontex. "Strategic action areas - annual work programme 2021". (pg. 25). https://frontex.europa.eu/assets/Key_Documents/MB_Decision/2020/MB_Decision_8_2020_adopting_preliminary_annual_work_programme_for_2021_and_final_draft_estimates.pdf
54. Frontex. "Research, innovation, good practice exchange and procurement plans for aerial surveillance and RPAS". (pg. 142). https://frontex.europa.eu/assets/Key_Documents/MB_Decision/2021/MB_Decision_1_2021_adopting_SPD_2021-2023.pdf
55. Frontex. "Research, innovation, good practice exchange and procurement plans for aerial surveillance and RPAS". (pg. 96, 103, 142) https://frontex.europa.eu/assets/Key_Documents/MB_Decision/2021/MB_Decision_1_2021_adopting_SPD_2021-2023.pdf

Table 6. EU projects' budget to subsidize border control activities

Name of the project	Objective	Time period	Coordinators	Budget details
MARISA	Ensuring collaboration among European actors and agencies as well as Member States' administrations with the aim of improving information exchange, situational awareness, decision-making and reaction capabilities.	1 May 2017 – 29 February 2020	Leonardo – Societa per Azioni, Italy	Overall budget: € 9,765,658.75 EU contribution: € 7,997,492.50[56]
ROBORDER	Develop a fully-functional autonomous border surveillance system with unmanned mobile robots including aerial vehicles, capable of functioning independently, in swarms and with multimodal sensors to foster an interoperable network.	1 May 2017 – 31 August 2021	Ethniko Kentro Erevnas Kai Technologikis Anaptyxis, Greece	Overall Budget: € 8,922,410.03 EU contribution: € 7,999,315.82[57]
BorderUAS[58]	Monitor the EU's external borders, supporting border surveillance applications through the development of a multi-role lighter-than-air (LTA) unmanned aerial vehicle with an ultra-high resolution multi-sensor surveillance payload. The technology is expected to be tested by police along border crossings in Greece, Bulgaria, Romania, Moldova, Ukraine and Belarus.	1 June 2020 – 30 November 2023	Fundación Centro de Tecnologias de Interacción Visual y de Comunicaciones Vicomtech, Spain	Overall Budget: € 6,997,332.50 EU contribution: € 6,997,332.50[59]
MIRROR	Develop an integrated platform "to detect discrepancies between perception and reality", analyzing multimedia and social networks. The results will be validated with border agencies.	1 June 2019 – 31 May 2022	Gottfried Wilhelm Leibniz Universitaet Hannover, Germany	Overall budget € 5,181,997.50 EU contribution: € 5,181,997.50[60]
ITFLOWS	Predict and manage migratory flows through the creation of an evidence-based information and communication technology-enabled solution called EUMigraTool.	1 September 2020 – 31 August 2023	Universidad Autonoma de Barcelona, Spain	Overall budget: € 4,871,832.50 EU contribution: € 4,871,830.75[61]
COMPASS2020	Beefing up the EU's external borders, enhancing the levels of effectiveness of maritime surveillance. The project aims to demonstrate that the coordinated use of manned and unmanned technologies and tools leads to better responses and reactions in the framework of maritime surveillance. It seeks to offer cost-effective and reliable operational solutions to coast guards and maritime authorities to enhance situational awareness.	1 May 2019 – 31 October 2021	Direção Geral da Autoridade Maritima, Portugal	Overall budget € 5,952,299.43 EU contribution € 4,838,489.61[62]
ARESIBO	Improve border security and surveillance systems. It will be tested in Finland, Greece, Romania and Portugal.	1 May 2019 – 30 April 2022	AIRBUS DEFENCE AND SPACE SAS, France	Overall budget € 6,999,882.50 EU contribution: € 6,999,882.50[63]
EFFECTOR	Foster cooperation between maritime stakeholders, maritime surveillance and border security through the implementation of an interoperability framework and associated data fusion and analytics services. It is being test in France, Portugal and Greece.	1 October 2020 – 30 September 2022	Secrétariat général de la mer, France	Overall budget € 5,882,380.00 EU contribution: € 4,999,529.50[64]
ANDROMEDA	Increase the effectiveness of maritime surveillance through the exchange of data and information via modern technologies.	1 September 2019 – 31 August 2021	Ministry of Maritime Affairs and Insular Policy, Greece	Overall budget: € 6,009,589.29 EU contribution: € 4,999,462.50[65]
METICOS	Create an up-to-date acceptance classification scheme of smart border control technologies to address the challenges of border management. It introduces Big Data Analysis of border control information systems and it is expected to create a real-time decision-support system to improve border control.	1 September 2020 – 31 August 2023	European University Cyprus, Cyprus	Overall budget € 4,997,481.25 EU contribution: € 4,997,481.25[66]

Source: Author's own, using references shown

56. CORDIS "Maritime Integrated Surveillance Awareness project". https://cordis.europa.eu/project/id/740698/es
57. CORDIS "Autonomous swarm of heterogeneous robots for border surveillance." https://cordis.europa.eu/project/id/740593
58. https://cordis.europa.eu/project/id/883272
59. CORDIS "Semi-autonomous border surveillance platform combining next generation unmanned aerial vehicles with ultra-high-resolution multi-sensor surveillance payload". https://cordis.europa.eu/project/id/883272
60. CORDIS "Migration-related risks caused by misconceptions of opportunities and requirement".https://cordis.europa.eu/project/id/832921
61. CORDIS "IT tools and methods for managing migration FLOWS". https://cordis.europa.eu/project/id/882986
62. CORDIS "Coordination of maritime assets for persistent and systematic surveillance". https://cordis.europa.eu/project/id/833650
63. CORDIS "Augmented reality enriched situation awareness for border security". https://cordis.europa.eu/project/id/833805
64. CORDIS "An end-to-end interoperability framework for maritime situational awareness at strategic and tactical operationshttps://cordis.europa.eu/project/id/883374
65. CORDIS "An enhanced common information sharing environment for border command, control and coordination systems". https://cordis.europa.eu/project/id/833881
66. CORDIS. "A platform for monitoring and prediction of social impact and acceptability of modern border control technology".https://cordis.europa.eu/project/id/883075

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