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FINANCING THE PORTUGUESE AIR FORCE CAPABILITIES [1]

O FINANCIAMENTO DE CAPACIDADES NA FORÇA AÉREA

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Abstract

The current macroeconomic context of strong economic constraints, growing asymmetrical warfare and worsening migratory crises that affect Europe's security and defence, compounded by the current global pandemic and the need to provide the Portuguese Armed Forces (AAFF), and the Portuguese Air Force (PrtAF) in particular, with the modern capabilities they need to carry out their mission, makes the process of financing these capabilities more challenging than ever. This study assesses if the PrtAF's procedures for applying to programmes that fund military capabilities can be optimised. The study uses inductive reasoning, a qualitative research strategy and a case study research design, supported by data collected from semi-structured interviews conducted with twenty experts in these matters from the three branches of the AAFF, the Armed Forces General Staff, the Ministry of Defence and the European Defence Agency. The findings led to the elaboration of eight measures that aim to improve the capability funding process, which consist of creating a Project Management Office, defining a strategy for the PrtAF's participation in financing programmes (identifying dual-use capabilities and exploring space for defence purposes), training Human Resources, improving networking, and placing military personnel in strategic positions outside their branch of origin.

Keywords: Financing programmes, Capabilities, PESCO, EDA, EDF, Project Management Office (PMO).

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[1] Article adapted from the individual research work carried out in the 2019/2020 Field Grade Officers Course. The defence took place in July 2020 at the Military University Institute.

Resumo

O atual contexto macroeconómico, de fortes constrangimentos económicos, crescentes conflitos assimétricos e agudizar das crises migratórias que afetam a Segurança e a Defesa da Europa, a par da situação de pandemia mundial e imprescindibilidade de dotar as Forças Armadas (FFAA), e a Força Aérea (FA) em particular, com capacidades modernas para realizar a sua missão, coloca desafios adicionais aos processos de financiamento destas capacidades. O presente estudo avalia a possibilidade de otimizar a praxis de participação da FA em programas de financiamento de capacidades militares, pauta-se por um raciocínio indutivo, estratégia de investigação qualitativa e estudo de caso como desenho de pesquisa, e baseia-se em dados das entrevistas semiestruturadas conduzidas a vinte experts nestas matérias dos três Ramos das FFAA, Estado-Maior-General das Forças Armadas, Ministério da Defesa e Agência Europeia de Defesa. Dos resultados obtidos, concluiu-se que poderá ser uma mais-valia implementar oito medidas associadas a um processo de financiamento de capacidades, e traduzidas na criação de um Project Management Office, definição da estratégia de participação nos programas de financiamento (identificação das capacidades de duplo uso e exploração do Espaço pela Defesa), formação dos Recursos Humanos, melhoria do networking e colocação de militares em posições estratégicas fora do Ramo.

Palavras-chave: *Programas de financiamento, Capacidades, PESCO, EDA, EDF, Project Management Office (PMO).*

1. Introduction

From 2008 to 2012, the Gross Domestic Product (GDP) of the European Union (EU) Member States (MS) dropped between 8% and 30%, which led to cuts in defence funding (*Deutsche Gesellschaft für Auswärtige Politik* [DGAP], 2020).

Simultaneously, in response to the changes in the international geopolitical landscape (the emergence of nationalist and populist movements, the intensification of migratory crises and the emergence of asymmetric wars, among other events), since 2015 the European Defence Agency (EDA) has conducted several initiatives in coordination with the European Commission (EC). These initiatives aim to provide the European Armed Forces (AAFF) with new capabilities and technologies and to develop the European defence industry (EDA, 2019a; EDA 2019b). Two of these mechanisms are the Permanent Structured Cooperation (PESCO) and the future European Defence Fund (EDF) (EDA, 2020a).

Portugal is naturally affected by this context, and there have been national initiatives, albeit on a smaller scale, to promote scientific and technological development and to build the AAFF branches' capabilities. One example of these initiatives is call for projects issued by the Ministry of National Defence (MoD) in 2014.

The Air Force (PrtAF) has also benefited from the increase in EC investment in capability funding programmes such as the SESAR programme, which co-financed the integration of new avionics systems on C-130H and Falcon 50 aircraft, as well as from programmes under Portugal 2020, which enabled the instrumentation of the Epsilon TB-30 aircraft (EMFA, 2020).

The situation is compounded by the pandemic declared on 11 March 2020 by the World Health Organization (WHO, 2020). The worst case scenario predicted by the economic bulletin

issued by the Bank of Portugal (BP) in March 2020 foreseen that the economic and financial repercussions of the pandemic lead to a drop of 5.7%[2] in Portugal's GDP in 2020 (BP, 2020). A report by the Fitch Rating Agency on 2 April 2020 predicted a drop of 4.2% in Europe's GDP (FitchRatings, 2020), highlighting the urgency of preparing a sizeable economic aid package to mitigate the crisis (in the value of €500 billion, as announced by the Eurogroup on 9 April 2020) (EC, 2020c). However, a more recent forecast of 7 July 2020 showed a considerably worse macroeconomic scenario, with a predicted annual drop of 11.5% in Europe's GDP (11.3% in Portugal's) (Organization for Economic Cooperation and Development [OECD], 2020).

In other words, the global context and the current climate of protectionism and threats among States is driving Europe, or, more precisely, the world into an economic crisis (CPOG 2019-2020, 2020) that will likely affect countries' defence budgets (DGAP, 2020), which had already seen significant cuts in the abovementioned period of 2008-2012.

In this context, on 27 May 2020, EC President Ursula von der Leyen announced a temporary funding package titled Next Generation EU, in the value of €750 billion, as well as a boost to the 2021-2027 Funding Programme, in a total investment of €1.85 trillion[3] (A.M. Correia, email interview, 7 June 2020; EC, 2020c). On 21 July 2020, after intense negotiations between European leaders, the European Council finally approved the amounts that would be granted to each country. Portugal would receive €15 billion in recovery funds and €30 billion from the 2021-2027 financing programme (Government, 2020).

In the words of the Portuguese Prime Minister, this is "an opportunity that Portugal cannot afford to waste" (Government, 2020). Thus, studies are needed to understand how the PrtAF can benefit from participating in national and supranational funding programmes.

The benefits of this funding strategy were highlighted by the Portuguese Minister of Defence in his interview on 5 July 2020 to the *International Security and Defence Journal,* where he stated that participating in cooperative programmes such as "PESCO is even more important in a context that will likely be marked by strong economic constraints" (Cravinho, 2020a). The Strategic Planning Directive of the Air Force Chief of Staff (CEMFA) for 2019-2022 also identifies this need and calls for the creation of a Project Management Office (PMO) "to provide timely information on potential sources of funding from various sources" (CEMFA, 2019a).

Thus, this study aims to analyse the PrtAF's procedures for financing military capabilities. The study is delimited (Santos & Lima, 2019):

– In terms of time, to 2014-2027, that is, the analysis will cover both the national procedures that have been followed over the last 6 years and the short / medium term organization of the funding programmes (over the next 7 years);

– In terms of space, to the AAFF, with special focus on the PrtAF;

– In terms of content, to the capability funding programmes of the EDA, the European Union (EU) and the European Commission (EC), and, at national level, to the programmes of the Ministry of National Defence (MoD), the Foundation for Science and Technology (FCT) and the future Space Defence Programme.

The study's general objective (GO) is to *Assess if the PrtAF's procedures for applying to capability funding programmes can be optimised*, and its specific objectives (SO) are:

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[2] The International Monetary Fund (IMF, 2020) predicts a drop of 8% in Portugal's GDP and 6.6% in Europe's GDP.

[3] €750 billion from the Next Generation EU programme and €1.1 billion from the 2021-2027 funding programme.

SO1: To analyse the procedures of counterpart defence agencies for applying to capability funding programmes.

SO2: To analyse the PrtAF's procedures for applying to capability funding programmes.

These goals will be achieved by answering the research question (RQ) *Can the PrtAF's procedures for applying to capability funding programmes be optimised?*

2. Theoretical and conceptual framework

This chapter presents the stateoftheart, the key concepts and the analysis model.

2.1. Literature review and key concepts

2.1.1. Financing programmes

The funding for the PrtAF's capabilities comes mainly from the Military Programming Law (LPM) (M.F. Pinto, telephone interview, 30 March 2020; P.C. Santos, email interview, 01 April 2020), which was revised and approved on 3 May 2019 (Organic Law No. 2/2019). This revision included funding for five evacuation helicopters and five aircraft for strategic and tactical airlift worth €53 million and €827 million, respectively (MoD, 2019).

However, the EDA, the EU and the EC also have several programmes, such as the Preparatory Action on Defence Research (PADR), which are crucial to the definition of the European Defence Industrial Development Programme (EDIDP) and the new European Defence Fund (EDF) set to begin in 2021 (EDA, 2020c). Furthermore, the LPM allocates a budget of €25 million during the first four years for cooperative programmes such as PESCO (MoD, 2019).

In addition to these programmes, which are usually allocated to defence projects, the PrtAF can also apply to other programmes for public and private organizations (e.g. Horizon 2020 and Horizon Europe, which are set to begin next year) (EC, n.d.a). Although these programmes are geared towards Research and Development (R&D) projects, they have at times been used to finance capability development (Barros, 2017) and will thus be included in this analysis. For the same reason, the national R&D programmes of the MoD, FCT and the future Space Defence Programme were also included in the study.

Thus, as outlined in Figure 1, the next section will examine in greater detail both the current supranational and national programmes[4] and the *initiatives*[5] to plan and define common strategies to analyse and solve the gaps in the Systems of Forces (SF), under the framework of the EDA, as well as the impact of the current economic crisis caused by the COVID-19 pandemic.

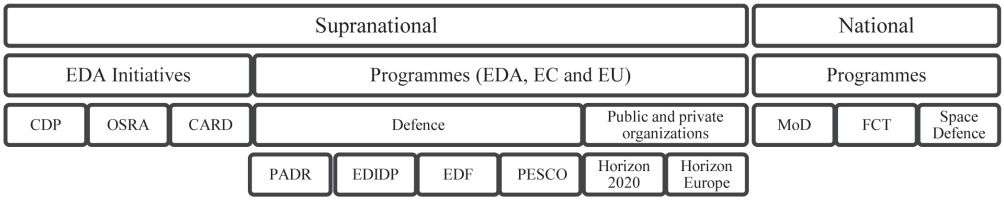


Figure 1 – Summary of funding programmes and initiatives

[4] In the case of programmes there are *funds* involved.

[5] Initiatives involve a *more strategic perspective*.

2.1.1.1. Supranational strategic initiatives within the framework of the EDA

The EDA has conducted several strategic initiatives to determine the needs and gaps of the SF of the different MS, and to align them with the available funding programmes. Figure 2 shows the three most high profile initiatives.

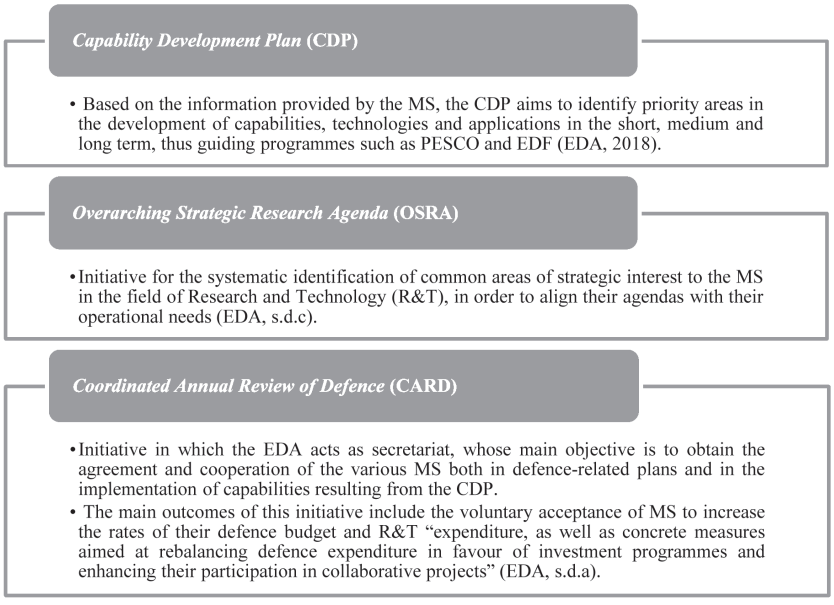


Figure 2 – Initiatives carried out by the EDA

2.1.1.2. Supranational defence programmes

The EC's defence programmes, which are of a smaller scale and which preceded the Preparatory Action on Defence Research (PADR), began in 2015 with the **Pilot Project** (PP). This project aimed to define new policies, legislation and structure for future EU programmes (EC, n.d.c.), as well as to determine who would be responsible for managing the initiatives (which include those listed in the previous section) and for elaborating the proposals and monitoring their implementation. This responsibility was delegated to the EDA (Tielbuerger, 2020), as this agency was deemed to have a better awareness of the defence needs of all ME (EDA, 2019a).

As for to R&T[6], the PP awarded €1.4 million in grants during 2015-2018.

The good results obtained by the PP were instrumental to the future PADR, which was launched in 2017 (Tielbuerger, 2020), providing a way to test the cooperation between the EDA and the EC and the link between the industry sector and R&T organizations.

Figure 3 lists the four supranational defence programmes.

[6] The EDA rates R&T projects according to their Technology Readiness Level (TRL), which ranges from 1 to 6, in which TRL 6 corresponds to a demonstrator (Barros, 2017). However, according to Gouveia (2019, p. 13), the MoD aims to achieve a R&D TRL level between 7 and 9. Thus, in this study, an R&D project managed by the MoD will imply a TRL between the prototype level (7) and validation level under operational conditions of use (9).

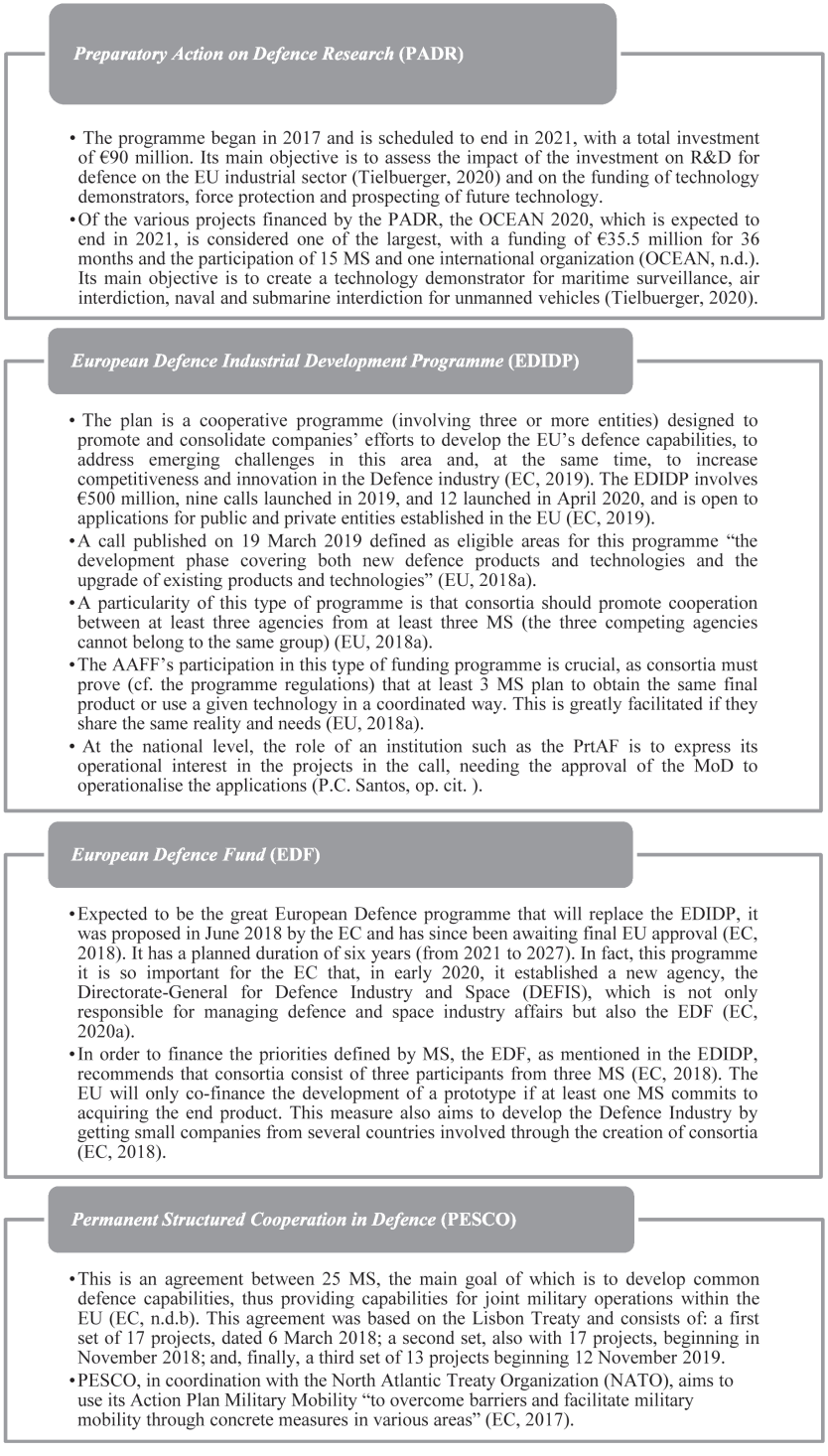


Figure 3 – Supranational defence programmes

2.1.1.3. Supranational programmes by public and private organizations

The next section describes the two programmes in Figure 4.

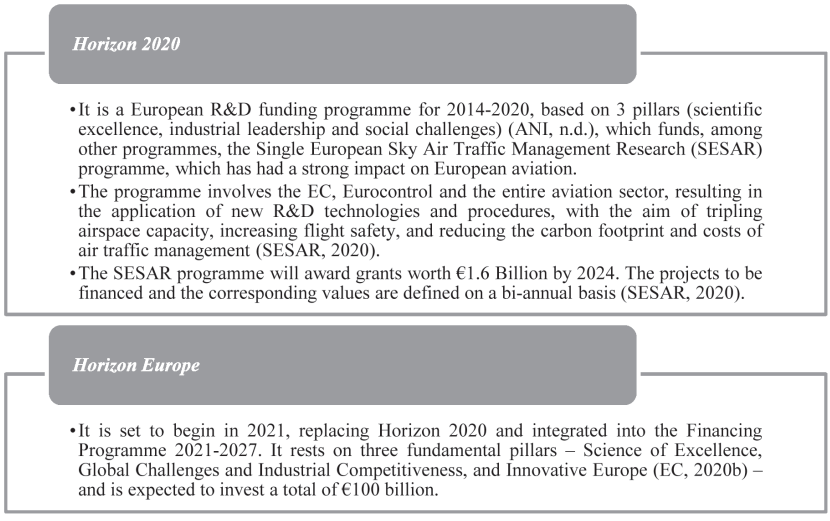
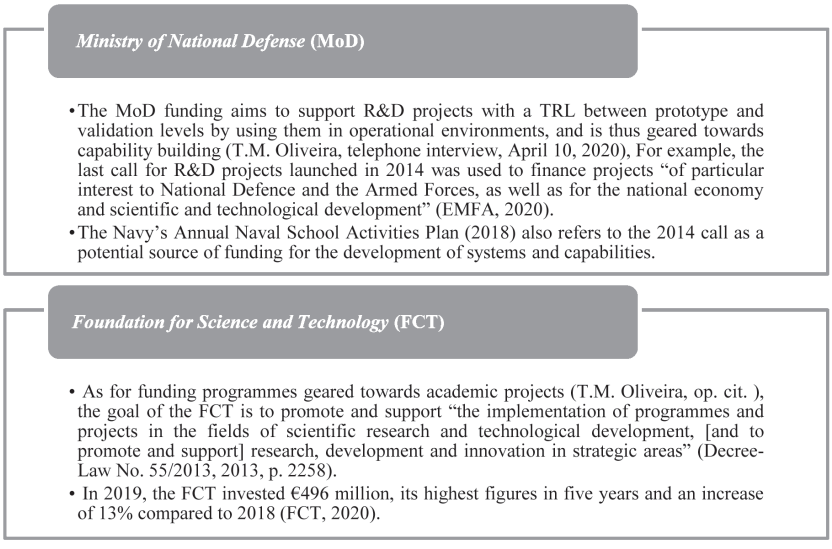


Figure 4 – Supranational programmes by public and private organizations

2.1.1.4. National programmes

In this study, *National Programmes* (Figure 5) are programmes that rely only on national funds (specifically from the FCT, MoD and Space Defence Programme). Therefore, this section will not include programmes implemented in Portugal but funded by the EU, such as Portugal 2020 (which is part of Horizon 2020, as mentioned above).



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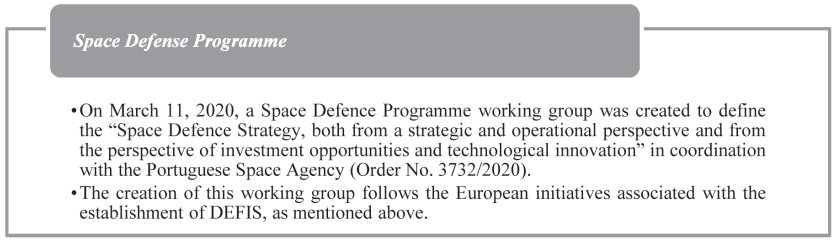

Figure 5 – Supranational defence programmes

2.1.1.5. The impact of COVID-19

The current global scenario (in its economic, social and other aspects) associated with the COVID-19 pandemic can be seen from two perspectives. The first is the importance of defence capabilities in combating complex emergencies. The second is that Europe needs to improve its resilience by investing in critical capabilities, thus defence should be seen as vital to strengthening European security and as a way to use the investment made in boosting the European economy (Cravinho, 2020a).

In an effort to revitalise the European economy, the EDF has taken on an even greater role in facilitating cooperation and recovering the European defence industry (EDA, 2020b). On 27 May 2020, the EDF and the Action Plan Military Mobility announced an investment of €8 and €1.5 billion, respectively (A. M. Correia, op. cit.; Correia, 2020a). As a result, the cuts were lower than what was planned before the COVID-19 outbreak (EC, 2018; EC, 2020c; Chatham House, 2020).

At the national level, although an economic crisis is expected (OECD, 2020), the Portuguese Minister of Defence, in his address to Parliament on 6 July 2020, spoke about important priorities that have "[...] implications in terms of investment in means and capabilities, [preferably] dual use capabilities [that enhance] the Armed Forces and improve the State's resilience and strategic reserves" (Cravinho, 2020b).

With regards to the funds allocated to the European Union Recovery Plan on 21 July 2020, Portugal will receive €15 billion in recovery aid over 10 years and €30 billion from 2021-2027 (Portuguese Government, 2020). Thus, the Portuguese government will likely maintain or even reinforce its defence investment. The proposal for a "Strategic Vision for Portugal's economic and social recovery plan 2020-2030" states that

> Portugal, as a geopolitical bridge between Europe, the US [United States of America], Ibero-America, North Africa, the Portuguese-speaking countries, the South Atlantic, and Asia [should strive to] exercise its soft power, which is linked to its diplomacy, to the international solidarity missions of the Portuguese Armed Forces, to its technology, and to the need to combat global threats, [therefore] the country should make efforts to strengthen its diplomacy and Armed Forces and provide them with the capabilities they need. (Silva, 2020)

2.1.2. Military capabilities

Any study on military capabilities must first clearly outline the *concept*, from the perspective of both national and European institutions, to understand the *process* that begins with the definition of the *strategic goals*, the *operational goals*, and, finally, with *capability planning* to address the gaps and needs of the SF[7].

2.1.2.1. Concept

There is no universal definition for this construct, and the way in which it is used depends on where it is used – i.e., on whether it is used by the EC (within the framework of the EDF) or by the national governments (in this case, the Portuguese government) –, as each country tends to adopt the formulation that best suits its interests and vision (Rodrigues, 2015).

When European institutions' funding programmes use the term 'capabilities', they are referring to defence capabilities. Military capabilities are defined as "[...] military assets, which include all relevant equipment, technology and materials. It does not include defence operations or other aspects required to manage those capabilities, such as staff training and logistical support" (EC, 2016).

Portugal has a broader definition that includes those aspects, in line with the Ministry Directive on Military Defence Planning (DMPDM) of 2014, and defines *military capabilities* as

> [...] a set of elements that are harmoniously articulated and complementary, which contribute to the accomplishment of a range of operational tasks or effects, and which include doctrine, organization, training, equipment, leadership, personnel, infrastructure and interoperability. (Decision No. 11400/2014, 2014, p. 23657)

Despite these different interpretations of the concept of military capabilities, the DMPDM of 2020 is clear on the need to develop them by applying to EU programmes in domains seen as strategic for defence (M.F. Pinto, op. cit.).

2.1.2.2. From strategic and operational goals to capability planning

The actions of the AAFF are based on legislation such as the Strategic Concept for National Defence (CEDN) (Council of Ministers Resolution No. 19/2013 of 05 April), the National Defence Directive on External Action (Decision No. 4101/2018 of 12 April) and the Ministry Directive on Military Defence Planning (DMPDM) (Decision no. 2536/2020, 2020). The DMPDM is aligned with the interests of the North Atlantic Treaty Organisation (NATO) and the EU CDP, and sets out policy guidelines on the military capabilities required to develop and build a SF during the 2019-2022 military defence planning cycle (Figure 6) (Decision No. 2536/2020, 2020; MoD, 2019).

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[7] A SF is a "[...] set of capabilities that the Armed Forces require to carry out its missions, which include the types and quantities of forces and means according to their operational complementarity", which has an operational component (the forces and means that will be used) and a fixed component that provides support to those capabilities (Organic Law 6/2014, 2014).

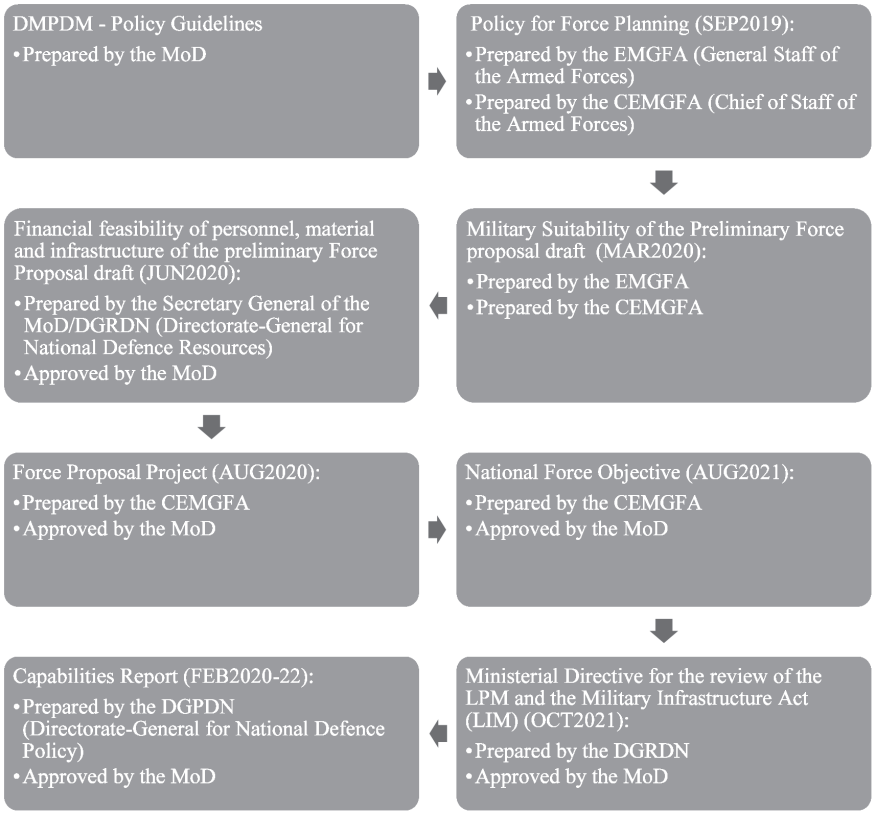


Figure 6 – Military Defence planning cycle
Source: Adapted from Decision No. 2536/2020 (2020, p. 40)

These documents include legislation specific to the branches, such as the provisions of the Organic Law on the Air Force (Decree-Law No. 187/2014, 2014), which defines the PrtAF's mission, and Council of Ministers Resolution No. 139/2018 of 23 October, which broadens the powers of this branch with regards to aerial means for combating rural fires. The PrtAF's Strategic Planning Directive 2019-2022 (CEMFA, 2019a) defines its three ***strategic objectives***: successful operation; a future based on people; and a modern PrtAF defined by excellence. The last strategic goal is to "develop entirely new ways of operating [and] to develop methods or carry out activities that contribute to the recognition of the PrtAF as a creative, innovative organization" (CEMFA, 2019a).

Based on the external and internal context in which the PrtAF operates, the strategic goals are unfolded into ***operational objectives*** (Figure 7 shows some of those goals).

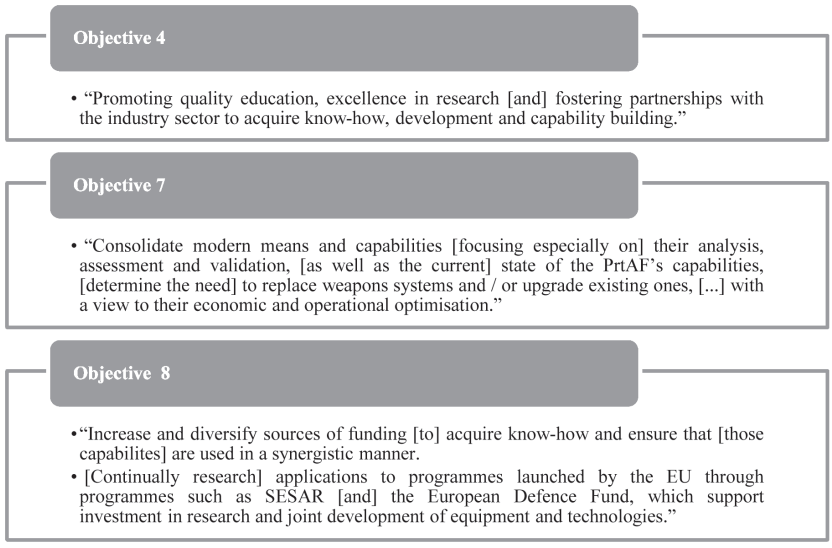


Figure 7 – Some objectives of the Strategic Planning Directive
Source: Strategic Planning Directive 2019-2022 (CEMFA, 2019a, pp. 12, 14-15).

Having described the *capability planning cycle* of the MoD in coordination with EMGFA and the PrtAF's strategic and operational goals for 2019/2020, it is important to understand the ***process*** behind the ***activities planning*** cycle. As shown in Figure 8, that process begins with the vision of the CEMFA and the definition of strategic guidelines for Operations, People and the Organization (CEMFA, 2019a). The Planning Division (DIVPLAN) of the EMFA is responsible for proposing the strategic goals to the CEMFA and for defining the guidelines of the Annual Plan of Activities (APA) based on the instructions of the Planning Directive (CEMFA, 2008). The plan is operationalized by the PrtAF agencies / services that carry out the planned activities and manage the funds required to carry them out (CEMFA, 2008). The process results in a Budget Proposal, a Directive on Management Goals that defines the indicators for each Activity, which make it possible to monitor its execution, and the Annual Activity Report (CEMFA, 2008).

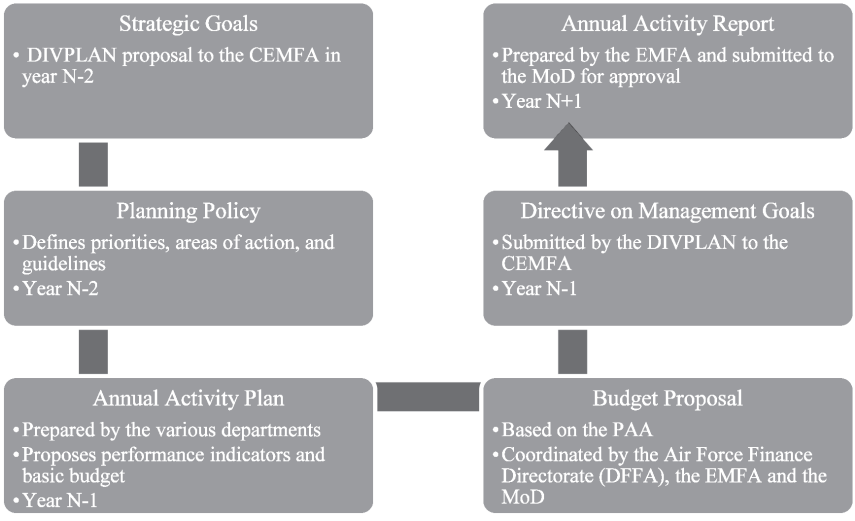
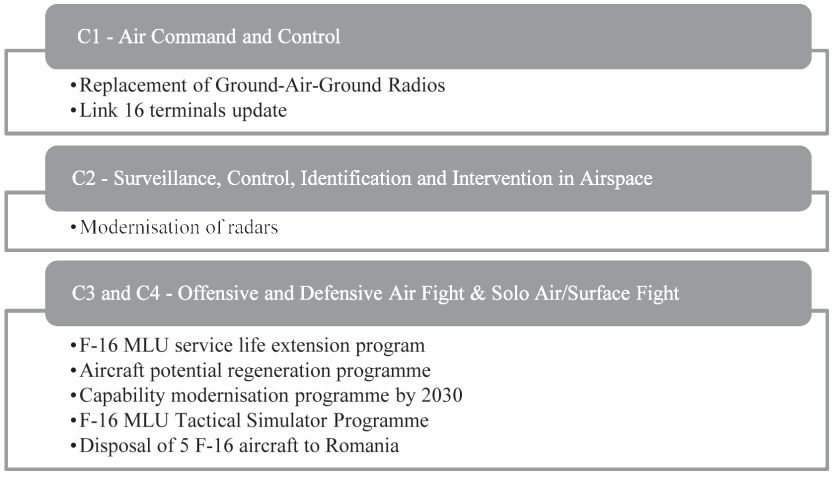


Figure 8 – Activity planning cycle process
Source: Adapted from CEMFA (2008).

The implementation of this *process* resulted in several projects for the 2019-2020 biennium, distributed by 12 capabilities (C) (Figure 9), two of which were supported by European funding programmes (C1 - Air Command and Control Capability; C6 - Strategic, Tactical and Special Airlift Capability). These two projects corresponded to 10% of the budget allocated by the LPM for 2019 (CEMFA, 2018; CEMFA, 2019a; CEMFA, 2019b). This is further proof of the importance of participating in capability funding programmes.



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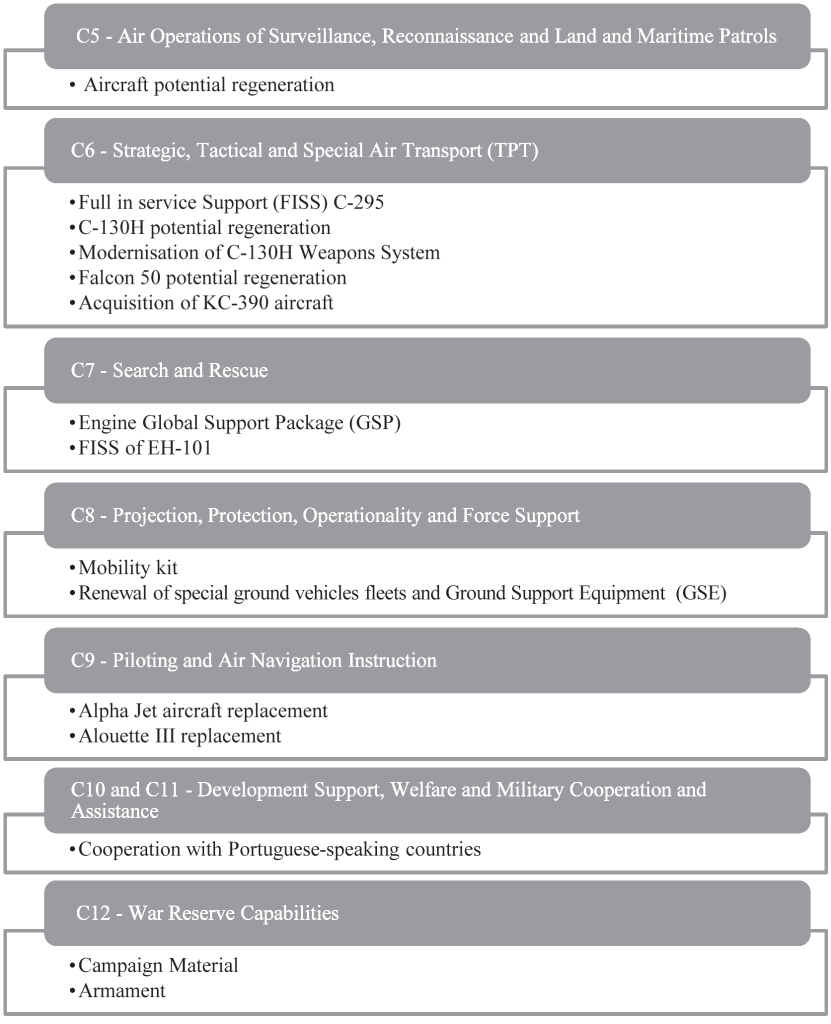


Figure 9 – Examples of projects distributed by 12 capabilities
Source: Adapted from CEMFA (2018), CEMFA (2019a) and CEMFA (2019b).

2.2. Analysis model

Table 1 shows the analysis model that guided this investigation.

Table 1 – Analysis model

General Objectives	To assess if the PrtAF's procedures for applying to capability funding programmes can be optimised.				
Specific Objectives	**Research Question**	Can the PrtAF's procedures for applying to capability finding programmes be optimised?			
	Subsidiary Questions	**Concepts**	**Dimensions**	**Indicators**	**Data collection techniques**
SO1 To analyse the procedures of counterpart defence agencies for applying to capability funding programmes.	**SQ1** What are the procedures of counterpart defence agencies for applying to capability funding programmes?	Funding programmes	Supranational defence programmes.	CapTech Projects; PADR; PESCO; EDIDP and future EDF	Literature review and semi-structured interviews
			Suprenational programmes by public and private organizations	Horizonte 2020;	
				Potential of the future Horizon Europe	
			National programmes	MoD call proposals of 2014	
				FCT	
			Impact of COVID-19	Participation in specific programmes	
				Strengthening programmes	
		Military capabilities	Strategic objectives	Directives for participation in funding programmes	
				R&D strategy linked to capability building	
				Iniciatives IDEIA and SEMENTE	
				Promoting cooperation with the BTID	
			Concept	Enhance dual use capabilities	
				Broad or narrow sense	
			Capability planning cycle	Carried out by the MoD, GAPP-PESCO and DGRDN	
				Carried out by the branches (PMO at ME)	
SO2 To analyse the PrtAF's procedures for applying to capability funding programmes.	**SQ2** What are the PrtAF's procedures for applying to capability funding programmes?	Funding programmes	Supranational defence programmes	PESCO	
				EDIDP and future EDF	
			Supranational programmes by public and private organizations	Horizonte 2020	
				Potential of the future Horizon Europe	
			National programmes	MoD call for proposals of 2014	
				FCT	
		Military capabilities	Strategic objectives	Need to define criteria	
				Need to promote cooperation with the BTID	
				Enhance dual capabilities	
			Concept	Broad or narrow sense	
			Capability planning cylce	Managed by the MoD, GAPP-PESCO and DGEDN	
				Managed by the branches (need for PMO at the EMFA)	

3. Methodology and method

This chapter describes the methodology and method that guided the investigation.

3.1. Methodology

The study used inductive reasoning methodology supported by a qualitative research strategy and a case study research design (Santos & Lima, 2019).

3.2. Method

3.2.1. Participants and procedure

Participants. The study sample consisted of 20 experts – 19 officers and one civilian (Table 2) –, who were interviewed during the exploratory (E) and pre-test (PT) phases, the "test" phase (T), and the validation / further analysis / reconfirmation phase.

Table 2 – List of interviewees

Function	Interviewed	E	PT	T			
				Area of expertise			
				EDA MDN EMGFA	PorAF	Army	Navy
Vice-Chairman of the Advisory Board of the Eurodefense Association-Portugal	Major-general (Reserve) Augusto Melo Correia			✓			
Director of the Research Centre of the Military University Institute (CIDIUM)	Commodore Ramalho Marreiros			✓			✓
Head of the Force Planning Division (RPF) of the Military Strategic Planning Division (DIPLAEM) of the Armed Forces General Staff (EMGFA)	Colonel Jorge Gonçalves			✓			
National Representative at NATO SEASPARROW Project Office	Commander Mendes Dias			✓			✓
Staff Officer, R&D and Finance Centre of the Navy General Staff (EMA)	Commander Lourenço da Piedade						✓
Professor of the Department of Science and Technology – Weapons and Electronics, Naval School	Commander Fidalgo Neves						✓
Former Representative of National Defence R&D in the Directorate-General for National Defence Resources (DGRDN)	Commander Amaral Arsénio			✓			
Deputy Air Force Logistics Commander (CLAFA)	Lieutenant Colonel Carlos Batalha			✓	✓		
Project Officer Land Systems and Technologies at EDA	Lieutenant Colonel Mário Martinho			✓			
Head of the Division of Analysis and Methods of the Operations Division (DIVOPS) of the Air Force General Staff (EMFA)	Lieutenant Colonel Alice Rodrigues	✓			✓		
Senior Project Manager at the Directorate-General for National Defence Resources (DGRDN)	Lieutenant Colonel Miguel Figueiredo			✓	✓		
Head of the Planning Division Plans Office (DIVPLAN) of the Air Force General Staff (EMFA)	Lieutenant Colonel Cabedal dos Santos	✓			✓		
Head of the Aircraft, Systems and Modernisation Bureau (RASM) of the Directorate of Engineering and Programs (DEP)	Lieutenant Colonel Carlos Bonito	✓			✓		

(Cont.)

Function	Interviewed	E	PT	T			
				Area of expertise			
				EDA MDN EMGFA	PorAF	Army	Navy
Head of the Operations Division (DIVOPS) of the Air Force General Staff (EMFA)	Lieutenant Colonel Abel Oliveira	✓					
R&D Project Manager at the Directorate-General for National Defence Resources (DGRDN)	Major Marco Pinto	✓	✓				
Head of the Strategic Planning Division of the Force Planning Division from the Army General Staff (EME) (in substitute)	Major Rui Cordeiro					✓	
Head of the Air Force Academy Research Centre (CIAFA)	Major Luis Félix				✓		
Head of the Department of Research and Development of the Air Force Academy (AFA)	Captain Tiago Oliveira	✓	✓				
Electro Avionics Engineer at the Aeronautical Design Office of the Directorate of Engineering and Programs (DEP)	Captain Francisco Machado				✓		
Director of the Centre for Research, Development and Innovation of the Military Academy (CINAMIL)	Professor José Borges					✓	

Procedure. A pre-test was carried out to validate the script of the semi-structured interviews. In this phase, the interviewees were contacted by telephone to obtain their consent to join the study, after which the respective interview scripts were sent by email. Once this initial feedback was processed, the potential interviewees were contacted (by telephone, email or videoconference) to present the topic and script of the semi-structured interview, to ask if they would be willing to be interviewed, and to guarantee the anonymity and confidentiality of their responses, which all participants waived. After obtaining their consent to participate in the study, the interviews were scheduled and carried out (in person, by email or videoconference). All participants were later asked to validate the answers cited in this study.

3.2.2. Data collection instruments

Four semi-structured interview scripts were prepared. The script delivered to the experts from the EMGFA, MoD and EDA was more comprehensive. The remaining three were tailored to each branch. The latter contained a group of common questions to allow for comparative analysis. The script prepared for the PrtAF included a set of knowledge centred questions that aimed to examine in more depth the PrtAF's internal procedures for applying to funding programmes.

3.2.3. Data processing technique

The content analysis of the semi-structured interviews followed a qualitative methodology based on the identification of *a priori* categories, similar to the one used by Fachada (2015).

4. Data presentation and discussion of results

This chapter analyses the collected data to provide an answer to the Subsidiary Questions (SQ) and the Research Question (RQ).

4.1. The procedures of counterpart defence agencies for applying to capability funding programmes

In its broadest sense, "counterpart" refers to the quality of being similar or alike by sharing certain characteristics (Dicionário Priberam, 2020). The counterparts analysed in this study are the Portuguese Navy (PN) and the Portuguese Army (PA), as well as the MoD and the EMGFA, whose procedures in this matter supersede and are applicable to the three branches.

4.1.1. MoD and EMGFA

Participating in funding programmes makes it possible to broaden the scope of projects or to redirect funds to build other capabilities (J.P. Marreiros, video conference interview, 5 May 2020; M.A. Figueiredo, email interview, 25 May 2020).

The steps listed in Figure 10 should be taken when planning a capability. One of the key steps is to define a strategy for developing that capability, that is, to understand if it is urgent to build it and if it can be acquired through a Commercial Off-The-Shelf (COTS) deal, a practice that has been, "the national procurement strategy for many years" (A.M. Correia, email interview, 2 June 2020), or, alternatively, through a "tailored solution" that could be developed nationally or in cooperation (M.A. Figueiredo, op. cit.).

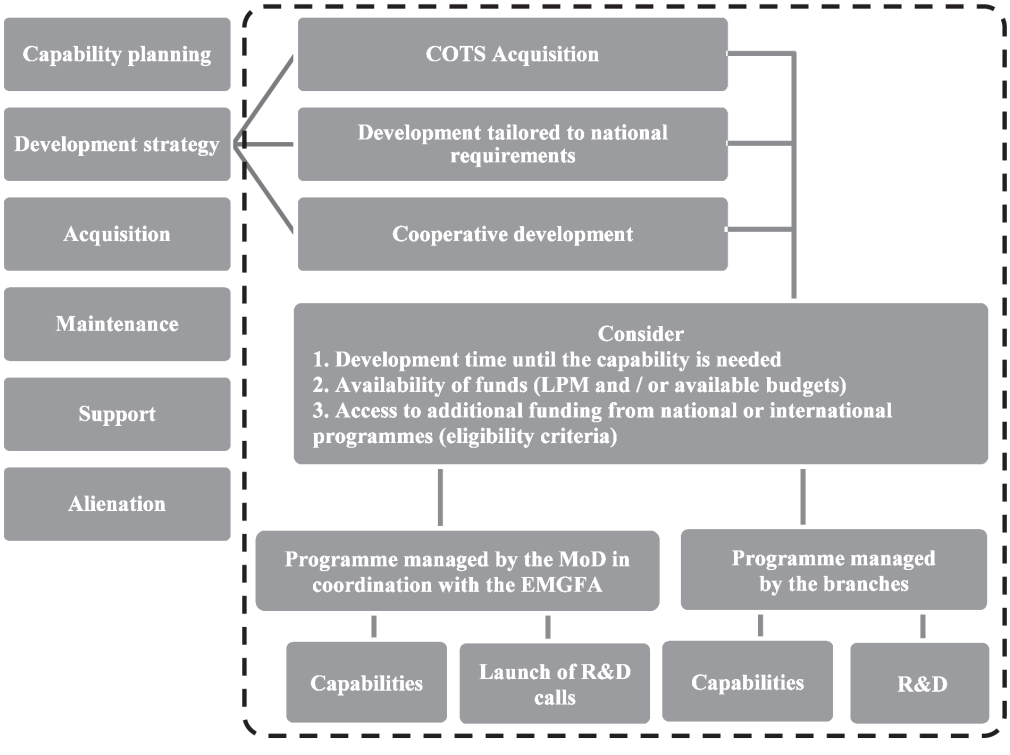


Figure 10 – Capability planning process
Source: Prepared from M.A. Figueiredo (op. cit.).

The "amount of funding involved" is an exclusionary criteria that determines which agency will conduct the programmes. The MoD manages projects that involve more significant grants (the case of PESCO, as defined in the "provisions of the CCP [Public Procurement Code]" (M.A. Figueiredo, op. cit.) and the cycle outlined in Figure 6.

On the other hand, the R&D programmes managed by the CDM – which contribute to capability building, as was the case of the 2014 call for proposals – are funded by the Central Services LPM (C.A. Batalha, video conference interview, 29 May 2020).

In the future, the "LPM funds will be invested in an R&D programme worth €2 million per year". Therefore, it is necessary to reformulate the goals to be achieved by participating in cooperative capability building projects (M.A. Figueiredo, op. cit.).

The programmes managed by the branches are divided into those that (C.M. Bonito, telephone interview, 27 March 2020; L.F. Félix, email interview, 13 May 2020; M.A. Figueiredo, op. cit; Figure 10):

– Fund capabilities (in the broad sense of the term) and rely on current budgets or are co-funded by the LPM (c.f. the cycle presented in Figure 6);

– R&D programmes, which are usually co-funded by their own budgets and may or may not contribute to capability building.

Having listed the different types funding programmes, the next section will analyse in further detail the programmes managed by the MoD because, according to A.M. Correia (op. cit.)

> It is clear that there is a need for a national defence procurement strategy that focuses on European co-operation in the phases of harmonisation of operational and technical requirements, design, development, production and cooperative procurement through European cooperative projects, as this will enable economies of scale, reduce unit costs and increase interoperability, in addition to providing a unique opportunity for our Technology and Industry Defence Base (BTID) to participate in European co-operative projects from the early stages.

Portugal actively participates in ten PESCO projects (six from the first wave, one from the second wave and three from the third) (M.A. Figueiredo, op. cit.).

The Portuguese participation in the third wave of projects was managed "initially by the Group Monitoring the Participation in PESCO Projects (GAPP-PESCO) created in March 2019, [as a result] of the decision of the Portuguese Defence Minister to participate in three projects (and to lead two of them) in areas of undeniable interest to National Defence: the EU Cyber Academy and Innovation Hub (EU CAIH) and the Maritime Unmanned AntiSubmarine System (MUSAS)" (M.A. Figueiredo, op. cit.)

The applications to EDIDP programmes (2019 and 2020 calls for proposals) are assessed on a case-by-case basis by the DGRDN and the branches, in coordination with the EMGFA and the GAPP (J.F. Gonçalves, telephone interview, 11 July 2020). The "institutional support to national participation in these projects, which are coordinated by the DGPDN and managed by the ministry, aims to improve the organization of the 2020 calls based on the lessons learned from the 2019 call" (M.A. Figueiredo, op. cit.).

Furthermore, the future EDF has highlighted the importance of warning the managerial structures that the FED funds are available to support the development of Europe's Technological and Industrial Defence Base (BTIDE) rather than national governments. Thus, complementary

resources such as the LPM are needed to acquire the products developed by these projects (L.F. Arsénio, interview, video conference, 20 May 2020; M.A. Figueiredo, op. cit.).

Moreover, a Council of Ministers Resolution (CMR) is currently being prepared to create

> a model of governance for Cooperative Security and Defence projects within the EU that best serves the national interest, either within the EC or the FED. [A model supported by] the experience gained at GAPP-PESCO and [that can be extended], with some adaptations, to FED projects. [A] model [that] enhances the national participation in projects considered essential to the national economy, [as well as] ensure that Portugal heads the PESCO and EDF projects in which it participates. [The GAPP-PESCO is also responsible for] analysing, assessing and prioritising PESCO projects according to the priorities listed in the European Defence Agency's Capability Development Plan and the NATO Defence Planning Process, [and for] coordinating the activities related to the implementation of the FED, specifically, the process to assess if the BTID's EDF applications serve the interest of National Defence. (M.A. Figueiredo, op. cit.)

The creation of this office will:

– Allow the Ministry to define priorities based on "their operational relevance, the capacity of the national industry, and the availability of funding to support national co-financing" (M.A. Figueiredo, op. cit.);

– Improve the coordination between the branches and the DGRDN (M.M. Martinho, video conference interview, 11 June 2020). The latter should continue to facilitate these capability building programmes because it has a "comprehensive and balanced overview of all branches" (P.M. Cordeiro, op. cit.).

According to Correia (2020b), there will be a change in the

> defence procurement paradigm and a new culture of national participation in European cooperative defence projects, from their early stages. These projects will be developed as the new mechanisms and instruments currently being prepared by the EU (CDP/2018, CARD, PESCO, EDF) are successfully implemented. Thus, the success of these mechanisms is crucial for this change to occur [and requires that the responsibilities of the GAPP-PESCO be defined and broadened].

Portugal's Space Strategy 2030 aims to create "a new structure (Working Group [Space Defence Programme] PRESDEF) [...] responsible for managing the AAFF's space capabilities [as this will] make the process of allocating the LPM funding more effectively and efficiently" (M.A. Figueiredo, op. cit.).

4.1.2. Portuguese Navy

The PN has participated in capability funding programmes managed by the MoD in coordination with the DGRDN (such as the PESCO MUSAS project, which Portugal headed; J.F. Neves, video conference interview, 15 May 2020), as well in programmes managed by the Navy General Staff (EMA), the Naval Research Centre (CINAV) and the Hydrographic Institute (IH) (P.M. Dias, video conference interview, 25 May 2020).

The latter are managed internally and allow the Navy "to participate in projects funded by capability development programmes and product research and development programmes that are aligned with the Navy's operational needs, especially during the requirements

identification phase and the final prototype testing phase" (J.C. Piedade, video conference interview, 20 May 2020).

Capability development projects are "centralised in the Navy General Staff, and their technical management is the responsibility of the staff of the units or services that proposed the project", while R&D projects are managed by the "Hydrographic Institute and the Naval Research Centre" (J.C. Piedade, op. cit.)

In order to define a strategy for participating in these projects,

> the Navy created the Navy Research, Development, Experimentation and Innovation Centre (IDEIA), which aims to leverage innovative and disruptive ideas that may be used for building capabilities, [as well as to] select and support ideas that align with the Navy's Strategic Directive. (J.C. Piedade, op. cit.)

A "non-permanent committee to monitor" new trends and needs, who "meets every 3 months and whose members are the EMA, the IH, CINAV and the Cell for Operational Experimentation of Unmanned Vehicles" (J.C. Piedade, op. cit.)

In order to facilitate organization, the Navy divides

> these projects into 3 areas: Marine Sciences (R&D projects carried out at the IH and CINAV); Military Capabilities (co-financed projects with funding percentages between 50-70%), and; Maritime and Naval Culture (J.C. Piedade, op. cit.)

This type of funding is of such importance that the PN is considering

> creating a permanent Innovation Division in [its] General Staff [...] to align the Navy's operational needs with the innovation programmes [to complement or replace the current system, i.e.] a single office staffed by one officer manages all the Navy's applications. [Essentially, a Division that] combines the skills required to manage the programmes, which will be responsible for coordinating the applications for administrative purposes (the technical expertise is the responsibility of the service or unit that proposed the application), for intellectual property management and for accumulating experience in several programmes. (J.C. Piedade, op. cit.)

Another aspect worth mentioning is that projects that involve dual-use capabilities have a higher approval and acceptance rate (J.C. Piedade, op. cit.).

Thus, this new Division would function as a "supervising PMO operating within the EMA, which would have a centralised vision of all the projects and would be responsible for defining the doctrine and strategy, as well as for managing the selection of the most relevant and urgent projects" (P.M. Dias, op. cit.).

Another aspect worth mentioning is that

> the EMA [is] responsible for issuing the R&D Directive that guides the various R&D projects that involve capability building, as the military investment projects proposed by the services should be assessed by the General Staff according to a set of criteria, which include stakeholders, planned activities, delivery time, budget, scope and risks, as well as to a portfolio analysis to find the ideal combination of projects that both maximises their strategic value (according to a set of predefined criteria that align with the military's strategic documentation) and minimises the costs. (P.M. Dias, op. cit.)

4.1.3. Portuguese Army

The PA has participated in capability funding programmes and in R&D capability building programmes.

One of the PA's most relevant R&D financing programmes is the SEMENTE initiative managed by CINAMIL, the entity that processes the applications to this type of programme. This initiative enables the development of new applications and ideas in the field of CBRN, which proved extremely useful in the early stages of the COVID-19 outbreak (J.A. Borges, video conference interview, 5 June 2020). J.A. Borges (op. cit.) highlighted that the efforts to combat COVID-19 have highlighted the potential of dual-use capabilities. Therefore, participating in CBRN capability development programmes is especially important.

The PA has participated in and / or supported several capability funding programmes over recent years, including

> projects within the framework of the EDA, which aim to strengthen Counter Improvised Explosive Devices (C-IED) and Chemical, Biological, Radiological and Nuclear (CBRN) capabilities in Operations, as well as in the PADR call for projects (2017-2019) (with three projects that involve capabilities under development for Force Protection and Soldier Combat Systems). (P.M. Cordeiro, email interview, 19 May 2020)

In addition to the Soldier Combat System programme, other examples of the development of future capabilities by the PA include "the development of uniforms, loading systems and protection systems, communications, the development of Battlefield Management System (BMS) and Dismounted Situational Awareness (DSA) software" (P.M. Cordeiro, op. cit.) and several Operational Budget Studies carried out by the EDA to demonstrate the technology (M.M. Martinho, op. cit.).

As analysed in the previous section, the PA's applications to funding programmes that involve significant funding are usually conducted by the DGRDN/MoD, the entity "responsible for liaising and coordinating the access to supplementary funding mechanisms" (J.A. Borges, op. cit.)

There are also internal programmes, which essentially aim to find "new solutions for meeting the operational requirements of the future battlefield, promoting financial synergies, linkages to the BTID and operational coherence" (P.M. Cordeiro, op. cit.). The AuxDefense project is a good example of the collaboration with the BTID. The project aims to design protection products with "advanced materials" that are lighter and perform better (J.A. Borges, op. cit.).

Finally, in the PA, all project opportunities are examined by the CEME in close collaboration with the CINAMIL "according to their relevance to the development of the military's ground capabilities" (J.A. Borges, op. cit.)

To facilitate this analysis, a biannual R&D planning cycle was outlined, which aims to clarify the directives for R&D capability building projects and determine the capability funding programmes in which the PA will participate (J.A. Borges, op. cit.).

4.1.4. Brief overview and answer to SQ1

The above analysis provided an answer to SQ1, *What are the procedures of counterpart defence agencies for applying to military capability funding programmes?* The analysis showed that the MoD, the EMGFA and the branches (PN and PA) have departments responsible for managing the applications to capability funding programmes. These departments analyse

and prioritise projects based on criteria defined by the Ministry (whether funds are available to co-finance the project, how the project contributes to bridge the gaps in military systems, its operational interest and if the capability has dual use potential, among other criteria).

This dual-use potential is one of the factors that both branches identified as having the greatest impact on the approval of a project, as it will broaden the scope of the project and optimise the return on the investment.

The answer to SQ1 for each counterpart is that, at the MoD, these departments are the DGRDN and the GAPP-PESCO. In the future, the GAPP-PESCO may be adapted and extended to FED projects, in coordination with the EDA's CDP planning cycle and with the NATO Defence Planning Process. This will allow for significant improvements in future processes. For example, the FED will integrate the lessons learned from the 2019 and 2020 calls for projects by EDIDP and PESCO, which will prove crucial when acquiring new capabilities, as participation in cooperative capability building programmes through COTS deals is expected to increase in light of the current situation.

The Ministry has also planned to allocate an annual funding of €2 million for cooperative R&D projects that involve capability building.

The MoD/EMGFA is currently discussing the creation of a department responsible for managing the AAFF's space capabilities.

Finally, the applications for capability funding programmes are managed by the General Staff, Research Centres, Laboratories and Institutes. The strategies for participating in the programmes are centralised and issued by the respective General Staffs, whereas their implementation and operation is decentralised.

Therefore, given the potential impact of R&D funding programmes on capability building, the PN is considering creating an Innovation Division that will identify capability needs and align them with the funding programmes available. The PN has also set up the IDEIA initiative to systematically identify opportunities and analyse projects. On the other hand, the PA strategy is defined by the General Staff, and its participation in funding programmes is usually managed by CINAMIL, although some projects are coordinated by the Army General Staff. The PA participates in projects within the framework of the EDA and in R&D projects that involve capability building, such as the AuxDefense project and the SEMENTE initiative funded by CINAMIL and implemented through CBRN-related projects, which have proved particularly useful in combating the COVID-19 pandemic.

Another procedure common to the two Branches is to outline and periodically review the strategies for participation in funding programmes. This practice is more consolidated in the PN (through the IDEIA initiative and the Strategic Directive).

Both branches agree that the key constraint in the participation in funding programmes is the difficulty in managing the applications due to a shortage of Human Resources (HR) and high turnover rates in these departments. Both the PN and the PA consider that continuity in these positions is crucial, as the staff must know all the details and processes associated with the various programmes available, in order to increase efficiency and optimise the coordination of the different stages of an application process.

All counterparts agree that participating in funding programmes will free up funds

for other uses. However, these programmes should be viewed as an opportunity and as a complementary form of funding because it is never certain if a project will be approved.

Finally, participating in programmes often requires the involvement of the BTID, therefore it is essential to establish a solid network of companies and universities whose skills may be relevant to defence and to establish consortia to participate in programmes.

4.2. The Air Force's participation in capability funding programmes.

4.2.1. Departments and processes

In the PrtAF, the DIVPLAN coordinates capability building based on the operational strategy defined by the Operations Division (DIVOPS) and prepares proposals to meet capability gaps which align with the branch's strategy. The DIVPLAN also acts as "liaison" or "privileged interlocutor" to the GAPP-PESCO, the DGPDN and the DGRDN in matters related to capability building. (C.A. Batalha, telephone interview, 10 July 2020; M.A. Figueiredo, op. cit.; P.S. Santos, video conference interview, 25 May 2020).

In addition to the activities of the DIVPLAN and the Resources Division (DIVREC), the Engineering and Programmes Department (DEP) – specifically the Aircraft, Systems and Modernisation Department (RASM) of the Programmes and Projects Office – is responsible for managing and monitoring the implementation of funding programmes in the PrtAF. The Weapons Systems Maintenance Department (DMSA) or the departments that proposed the application are responsible for the technical implementation (C.M. Bonito, op. cit.).

The CIAFA has also conducted R&D funding programmes "in areas of interest to the PrtAF which have been identified by the CIAFA, [which] do not necessarily correspond to capability building needs, [as they] mainly consist of research activities that are not expected to have operational results in the short-term" (L. F. Félix, op. cit.), but which may nevertheless "lead to the creation] of new capabilities for the SF and [contribute to] the sustainability of WS [Weapons Systems]" (Gouveia, 2019).

The FCT has also supported some R&D projects and PhD fellowships, albeit from a more academic perspective (T.M. Oliveira, op. cit.).

The PrtAF's internal project evaluation criteria

> are not as well defined as those of the MoD, [as] the projects are not selected through a systematic analysis of needs vs. funding offers, [but] are often triggered by external proposals for collaboration that are usually circumstantial (people, acquaintances, needs) and thus may not address the most critical areas. (A.C. Rodrigues, email interview, 13 May 2020)

This stems from a lack of "medium / long term planning in terms of capability building, [which] enables the identification of areas that require innovation or development" (L.F. Félix, op. cit.), as well as a lack of "benchmarking [...] stakeholders, roles and responsibilities, in addition to a lack of alignment [and] a defined planning review cycle" (A.C. Rodrigues, op. cit.)

This stems from the lack of a department / office that systematically identifies opportunities (A.D. Oliveira, telephone interview, 27 March 2020; A.C. Rodrigues, telephone interview, 25 March 2020). Specifically, a department / office that would be responsible for conducting a detailed analysis of how the PrtAF could use this type of programme to finance the acquisition

or modernisation of its capabilities, which would have a slightly broader scope of action than the current system, in order to coordinate all applications to calls (A.C. Rodrigues, op. cit.; F.M. Machado, email interview, 17 July 2020).

Furthermore, A.C. Rodrigues (op. cit.) identified the need to set up "formal mechanisms of internal coordination, [...] periodic meetings with the EMFA (Division Heads [...] and project managers, for example), and biannual reports to the CEMFA", as is common practice in civilian universities, which have "services that exclusively responsible for the projects' administrative and financial management" (L.F. Félix, op. cit.).

Finally, the PrtAF has recently participated in several capability funding programmes, more specifically EDIDP and PESCO, and

> will integrate an international consortium led by Belgium for the development of the European High Altitude Platform Station (HAPS) project [...] within in the framework of the 2019 call for projects by EDIDP. [Concurrently with PESCO] some of these projects could provide capabilities that the PrtAF needs, such as the European Secure Software Defined Radio (ESSOR) and the Strategic Command and Control (C2) System for [Common Security and Defence Policy] CSDP Missions and Operations. (M.A. Figueiredo, op. cit.)

C.A. Batalha (op. cit.) highlighted two of the European projects and sources of funding in which the PrtAF has successfully participated: the modernisation of the C-130H, Falcon 50 and Epsilon aircraft, which was carried out with funds from the SESAR programme and therefore reduced the need for funding from the LPM; "[...] the creation, in 2022, of a Multinational Helicopter Training Centre (MHTC) at the PrtAF's Sintra facilities, which will allow the PrtAF to improve capabilities [such as] tactical training and develop doctrine through an investment in kind by the MoD and the PrtAF".

For C.A. Batalha (op. cit.), one of the key factors for the success of the projects managed outside the PrtAF, and more specifically of the MHTC (EDA, 2020b), was the fact that the PrtAF personnel that triggered the projects were placed at the MoD and had excellent contact networks with the EDA, which allowed them to set up synergies and provide closer advice to policy makers.

4.2.2. Brief overview and answer to SQ2

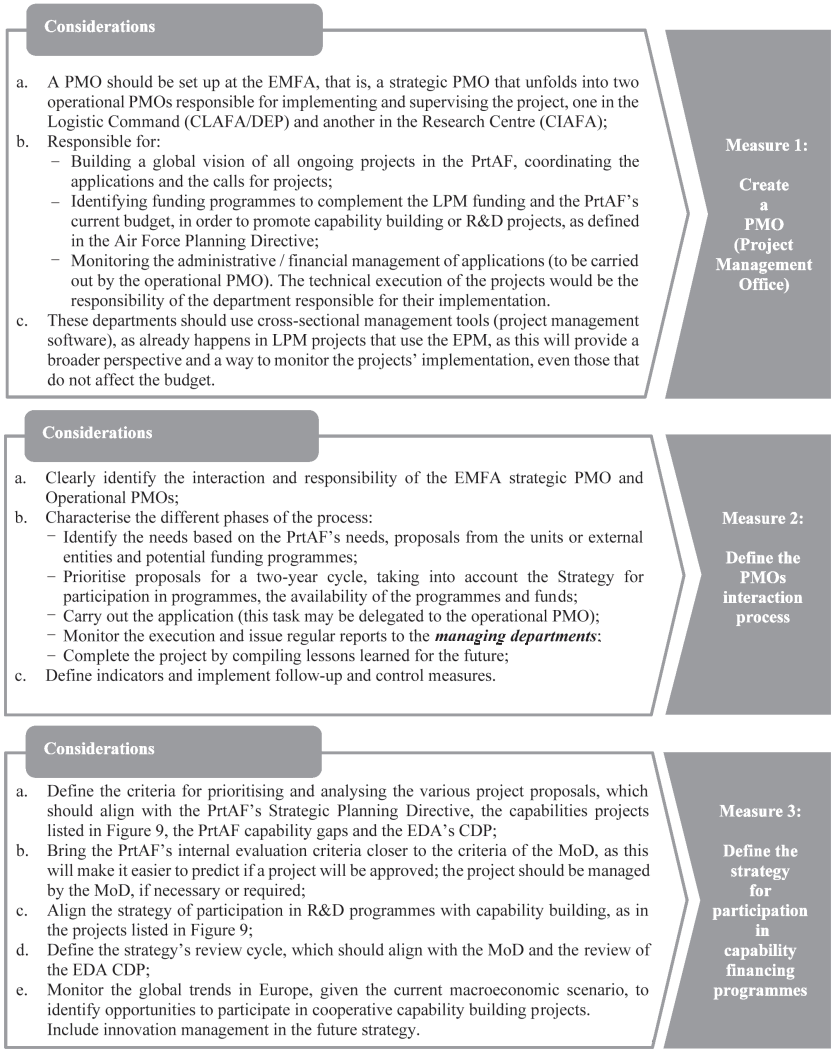
The above analysis provided an answer to SQ2, *What are the PrtAF's procedures for applying to capability funding programmes?* The analysis showed that the Air Force has participated in programmes managed by the GAPP-PESCO, the DGPDN and the DGRDN, and that the DIVPLAN (in coordination with the DIVREC and DIVOPS) is the main point of contact with the MoD. In addition to this department responsible for liaising between the PrtAF and external agencies, the PrtAF has services that manage and monitor the administrative implementation of the programmes (the RASM of the Programmes and Projects Office of the DEP), and others that manage the technical implementation (the DMSA or the services that proposed the application). The CIAFA is responsible for conducting R&D funding programmes in areas of interest to the PrtAF.

With regards to specific programmes, the PrtAF has modernised the Falcon 50 and C-130H aircraft with co-financing from the SESAR programme and, in the near future, the participation in PESCO, EDIDP, as well as the EDA (through the creation of the MHTC to establish synergies and contact networks) will result in the acquisition of important capabilities.

These synergies were facilitated and enhanced by the fact that the PrtAF personnel involved are placed in decision-making bodies (DGRDN, EMGFA, EDA, among others). Finally, these programmes should not be taken for granted, but should be seen as an opportunity to free up funds for other projects, or as alternative ways of leveraging investments.

4.3. Opportunities for improving the participation in capability funding programmes and answer to the RQ

The above analysis provided an answer to the RQ, *Can the PrtAF's procedures for applying to capability funding programmes be optimised?* The findings revealed that they can, by implementing eight measures that correspond to eight considerations (Figure 11) and by implementing the capability funding process presented in Figure 12.



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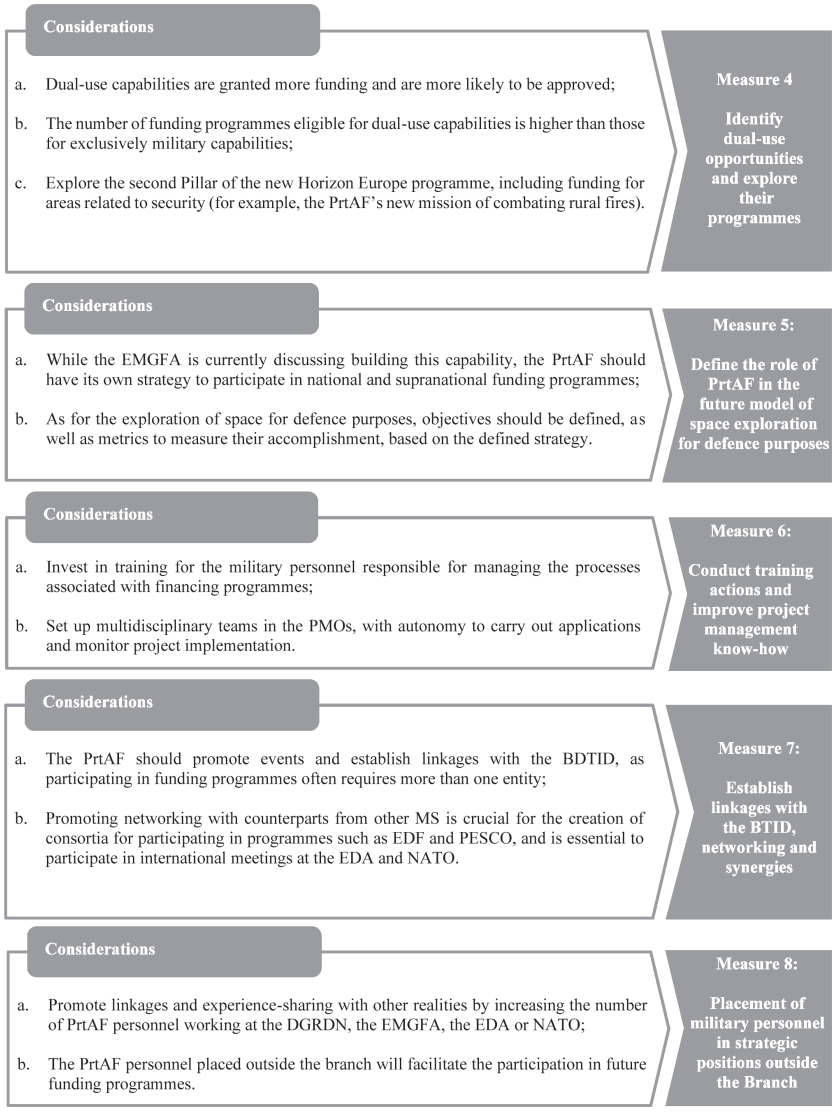

Figure 11 – Considerations and measures for optimising the PrtAF's procedures for applying to capability funding programmes

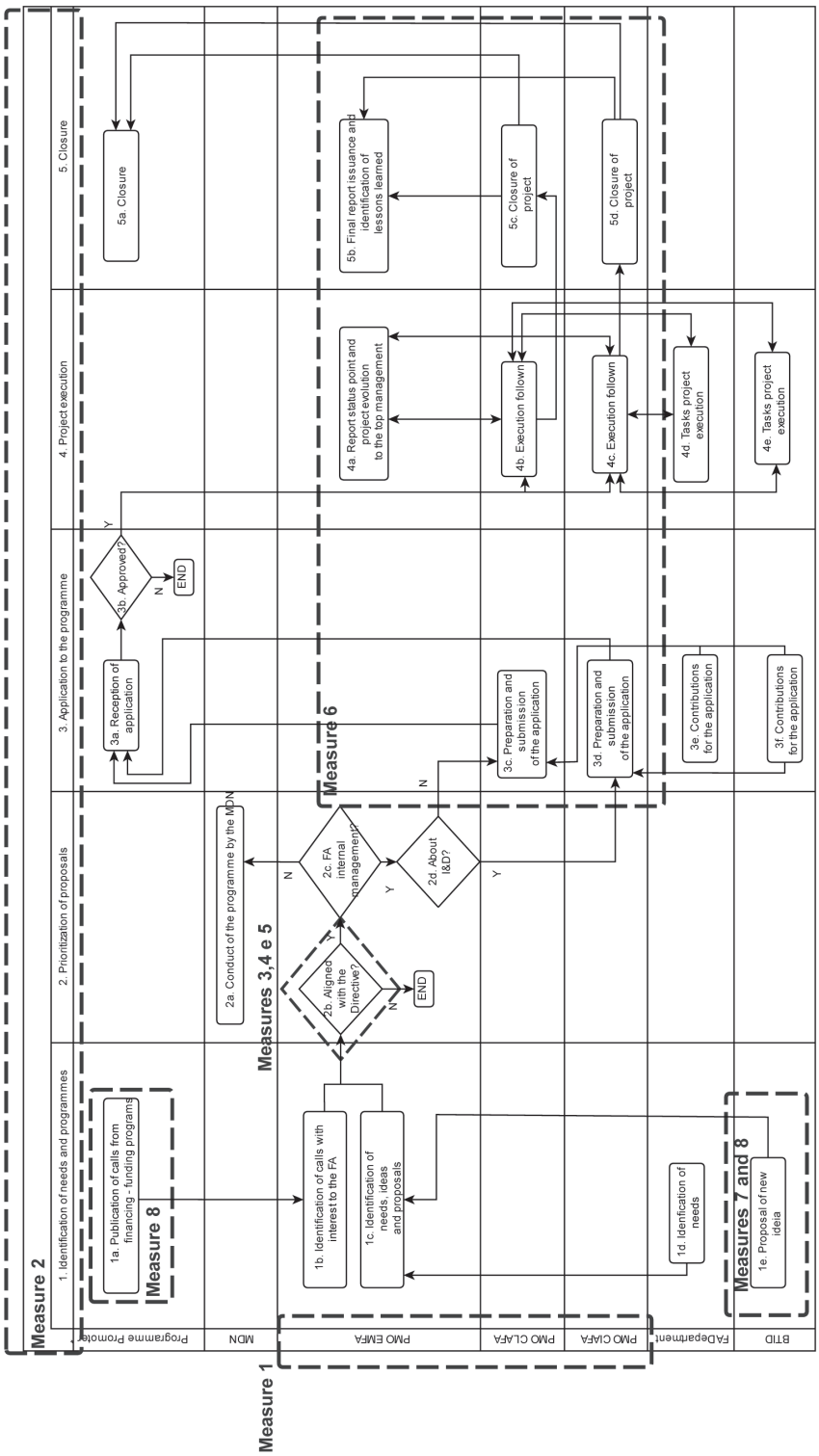

Figure 12 – The PrtAF's capability funding process for specific programmes (and how they will be affected by the eight measures proposed in this investigation)

5. Conclusions

The emergence of asymmetric conflicts in Europe, compounded by the migration crisis and the emergence of nationalist and populist movements has, since 2015, led to growing concern with providing the European AAFF with new capabilities and technologies.

On the other hand, the high costs of the COVID-19 outbreak, which was officially declared a pandemic on 11 March 2020, resulted in an unprecedented global economic crisis and are expected to lead to a drop in the GDP of the euro zone of about 12% in 2020, which could have repercussions for the defence sector. Portugal will naturally be affected by this context.

Given the current macro-economic scenario, after several negotiations, the EC has managed to reach the consensus required to approve a set of packages that aim to bolster Europe's economic recovery. These measures include a boost to the multi-annual financing framework for 2021-2027 (€1.1 billion, of which €30 billion are earmarked for Portugal) and the creation of a temporary recovery instrument titled Next Generation EU (€750 billion), through which Portugal will receive €15 billion over a period of 10 years.

Thus, the programmes set up for defence have also had their funding increased. In early 2020, the future EDF and the Action Plan Military Mobility were expected to suffer significant cuts to their funding. However, the cuts were less than expected due to the need to stimulate the European defence industry and strengthen the EU's defence capabilities.

Furthermore, the capability procurement procedures have changed and the ME of the EU are increasingly resorting to capability building consortia, which are especially important in situations of severe economic constraints. On the other hand, the "Strategic vision for Portugal's economic and social recovery plan 2020-2030" acknowledges the importance of the AAFF capabilities in establishing Portugal as a mid-sized soft power within the context of geopolitical relations between Europe, the US, Ibero-America, North Africa, the Portuguese-speaking countries, the South Atlantic and Asia.

The PrtAF is naturally affected by this context. It has participated in capability financing programmes such as PESCO, SESAR, EDIDP and Portugal 2020, which have allowed it to free up funds for other uses, among other benefits.

Thus, this study aimed to analyse the PrtAF's procedures to fund military capabilities. The study was delimited in terms of time to 2014-2027; in terms of space, to the AAFF, with special focus on the PrtAF; in terms of content, to supranational capability funding programmes such as those provided by the EDA, the European Union (EU) and the European Commission (EC), and by the Ministry of National Defence (MoD), the Foundation for Science and Technology (FCT) and the future Space Defence Programme.

Therefore, the SO, *To analyse the participation of other defence counterparts in capability funding programmes*, and the corresponding RQ were answered by conducting a content analysis on semi-structured interviews with 12 experts from five counterpart institutions (EDA, MoD, EMGFA, PA and PN). The findings revealed that it is crucial to create a PMO because it would provide a broader perspective and centralise the information. The study also found that the values involved in the programmes is one of the criteria that distinguish projects managed by the Ministry from projects managed the branches.

The DGRDN, DGPDN and GAPP-PESCO are responsible for analysing the proposals of

the branches, in coordination with the EMGFA. In the near future, the responsibilities of GAPP-PESCO will be extended to include FED projects, in articulation with the EDA's CDP planning cycle and the NATO Defence Planning Process. Thus, the projects presented by the branches in response to calls from supranational programmes such as PESCO, EDIDP or the future EDF are ranked by priority by the DGRDN and GAPP-PESCO, according to predefined criteria. One such criteria is if the capability can be used in a dual use system. Another aspect that should be considered is that the EDF is geared towards supporting the European Defence Industry (EDTIB) rather than individual governments.

With regards to the branches, both the PN and the PA have their own strategies of participation in funding programmes, which are centralised and issued by their respective General Staffs, and implemented and operationalized by their respective services, Research Centres, Laboratories and Institutes. Another common aspect is that the programmes carried out by these two branches usually require co-financing from the LPM or each branch's budget, depending on the funds involved in the project.

The PN created the Navy's Research, Development, Experimentation and Innovation Centre (IDEIA) to analyse the ideas of the Navy services and of external entities and assess if they align with the Navy's Strategic Directives. In addition to actively participating in several PESCO projects (and heading the PESCO MUSAS project), the PN plans to set up a supervising PMO at the EMA and is discussing the creation of an Innovation Division with the required synergies and HR to manage all applications for funding programmes. While the PA has focused mainly on the funding programmes provided by the EDA, it also participates in Portugal 2020 programmes and has a good relationship with the BTID. One example of this is the AuxDefense programme, which resulted in several operational products that were eventually acquired by the Army and used on the battlefield. This AAFF branch has also implemented the SEMENTE initiative managed by CINAMIL, which enables the development of new applications and ideas in the field of CBRN that proved extremely useful in the early stages of the COVID-19 outbreak.

With regards to SO2 –*To analyse the PrtAF's procedures for applying to capability funding programmes* – and to the answer to SQ2 – *What are the PrtAF's procedures for applying to capability funding programmes?* –, based on the interviews conducted with 7 experts (officers), the Air Force has participated in programmes carried out by GAPP-PESCO, the DGPDN and the DGRDN. Furthermore, the DIVPLAN (in coordination with DIVREC and DIVOPS) is the main point of contact with the MoD. In addition to these three bodies, the following departments also manage financing programmes: the RASM of the Programmes and Projects Office of the DEP manages and monitors the administrative implementation of the programmes; the DMSA and the services that propose the applications manage the technical implementation; the CIAFA is responsible for conducting R&D funding programmes in areas of interest to the PrtAF.

The PrtAF has participated in successful programmes, such as PESCO, EDIDP and SESAR, through which it has financed the modernisation of Falcon 50 and C-130H aircraft. It has also participated in the creation of the MHTC within the EDA, which aims to foster synergies and networking. These programmes show that it is crucial to place PrtAF personnel in key

structures such as the DGRDN, the EMGFA and the EDA, among others, as these networks of contacts have proved essential to establish synergies and set up consortia to collaborate in the applications to these programmes.

Finally, there is a need to improve / optimise the knowledge on cooperative programmes, to create a department (the PMO) that has a broad, centralised vision, so it can align the needs of the SF to the available funding programmes, and to define a Strategic Directive regulating the participation in funding programmes, given that they are generally co-financed and that their approval is not guaranteed.

In light of the above, the study's general objective (GO) – *To assess if the PrtAF's procedures for applying to capability funding programmes can be optimised* – was achieved, and the RQ answered: it can be optimised by implementing the eight measures drawn from the considerations below, which can be operationalized as shown in Figure 12:

1. Creating a strategic Project Management Office (PMO) at the EMFA that will be responsible for identifying funding opportunities and aligning the needs of the SF with the operational programmes, as well as for providing guidance to the operational PMOs at CLAFA/DEP and CIAFA, as well as for liaising with the DGRDN when the projects are managed by entities outside the PrtAF;
2. Implementing the PMO's operating process as proposed and defining the responsibilities and interaction(s) between the strategic PMO at the EMFA and the Operational PMOs (CLAFA/DEP and CIAFA PMOs);
3. Defining the strategy to participate in capability funding programmes, aligning it with the needs of the PrtAF and the provisions of the Strategic Planning Directive, as this is crucial to identify both the selection and evaluation criteria used by the Ministry when assessing projects, which should also align with the EDA's CDP, and critical R&D areas linked to capacity building;
4. Identifying dual use opportunities, as there are more funding programmes that value this type of capability (as reflected in the second pillar of the new Horizon Europe Security programme);
5. Defining the role of the PrtAF in the future model of space exploration for defence purposes (this capability that is currently under discussion at the EMGFA, but the PrtAF should develop its own objectives and metrics so it can apply to any national or supranational programmes related to space and defence that may be set up in the future);
6. Provide training to the Human Resources responsible for managing the projects and creating multidisciplinary teams in both strategic and operational PMOs;
7. Establishing linkages and networking with the BTID through initiatives or events of interest to the PrtAF, to allow military personnel, companies and universities to share experiences and to facilitate the establishment of consortia for joint participation in programmes such as the EDF and PESCO;
8. Placing military personnel in strategic positions outside their branch of origin to optimise their influence and enhance the participation in funding programmes.

This study's main **contributions to knowledge** are that the PrtAF is now aware of empirical and scientifically validated evidence on how to maximise its participation in capability funding

programmes, and that the required measures will implement the provisions of the PrtAF's Strategic Directive, that is, the need to create a PMO, as well as to achieve the vision of policy makers and the proposal of the "Strategic vision for Portugal's economic and social recovery plan 2020-2030", which aims to revitalise the National Defence economy and build the Armed Forces' capabilities through cooperative projects to make Portugal a mid-sized soft power.

The study had **two limitations**, which were extraneous to the study and did not limit its contributions. The first is the fact that it has not been possible to contact other European counterparts of a similar size to the PrtAF to understand their procedures for participating in capability funding programmes, largely due to the COVID-19 pandemic, which has made this type of networking difficult. The second is that it was not possible to analyse programmes such as Horizon Europe in more detail, as the specific measures of these programmes are under review in light of the current macroeconomic and security context in Europe.

With regards to **future studies**, it would be relevant to analyse the new Horizon Europe programme in further detail, as this programme includes a significant amount of funding for dual use capabilities, to which the PrtAF can apply (for example, to fulfil its mission of combating rural fires). Furthermore, it would be useful to analyse other counterpart ME of similar size to Portugal, in order to determine their procedures to apply to supranational capability funding programmes.

This study's **practical recommendation** is that the EMFA implements the eight measures and the capability funding process proposed in this investigation.

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