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ETUC Project "Involving Trade Unions into adaptation policy"

Thematic workshop #4 –
Consequences of climate change on rescue and emergency services – A focus on firefighters

DISCUSSION PAPER prepared by Syndex

This document is part of the ETUC European project on adaptation to climate change. The three main objectives of this project are : (1) to inform European trade unions about the consequences of climate change on the world of work; (2) to prepare trade unions to play an active role in the design and implementation of the national strategies for adaptation; (3) to develop a tool kit for trade unions to bring adaptation on the agenda of industrial relations. The outcome of this project will be based on the results of 2 questionnaires sent to national and sectoral European trade unions as well as on 5 thematic workshops[1], each of them dedicated to a specific theme : adaptation and the world of work, sectors and regions at risk, working conditions and health and safety, emergency services, role of public authorities.

The present paper will be presented by Syndex during the last session (#6) of the seminar. The participants will be split into groups and invited to discuss its' content and to reflect on the possible implications of climate change and adaptation policies emergency sectors. The outcome of these discussions will be integrated to the final study.

1. Introduction

Climate change is increasingly recognized as a major threat to the stability and prosperity of society. No matter what the climate change mitigation efforts are, unavoidable climate impacts will take place together with the economic, social and environmental costs coming along.

At COP 21 in Paris, countries committed to keep global warming well below 2°C and to continue efforts to maintain it under 1.5°C compared to pre-industrial levels. Countries also committed to become carbon neutral by the end of this century[2]. Despite all the already visible effects of climate change, the actual collective mitigation efforts appear, however, to be insufficient to limit global warming to the abovementioned extents. The USA have withdrawn from the Treaty. The Amazon forest has been burning thorough the autumn, while in Europe, several countries, including EU's biggest emitters France and Germany, are about to fail to meet their 2020 targets.

While climate change is expected to continue, emergency and rescue services are expected to be at the forefront of the fight against its negative effects. The multiplication of extreme weather events (floods, droughts, storms, heat waves, etc.) will lead to an increase in accidents and casualties, putting firefighters and rescue services under pressure (I). At the same time, the multiple human-health related impacts of climate change (heat stress, air pollution, epidemics, etc.) will lead to additional work-load for the health care sector, at a time where it is already under pressure, facing new challenges as well as budget cuts (II). Despite this, the different national adaption policies and strategies do not say much about the impacts on emergency and rescue services. Trade union action is therefore urgently needed in order to ensure emergency and rescue services are being given the necessary means (budget, staff, equipment, training) to face the forthcoming challenges (III).

[1] The 5 selected themes are: adaptation and the world of work, sectors and regions at risk, working conditions and health and safety, emergency services, role of public authorities.

[2] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

2. Climate change and its impact over fire and rescue services

High overall temperatures, the increased number of extremely hot days, wind variability and low humidity are essential factors behind the rise in fire risk and activity, affecting fire behavior from its ignition to its spread. In the recent past, numerous scientific reports have demonstrated the link between hot dry summers and the number of fires, in particular forest fires and wild fires (grass and heathland fires, straw or stubble burning, etc.). Climate change will also lead to an increase of the number of floods, droughts, storms and heat waves, what in turn will impact firefighters working conditions, health and safety.

2.1. Increased risks of fires

According to the JRC Peseta III report[3], it is clear that the danger of forest fires driven by weather is expected to increase with climate change. This increase will be particularly important around the Mediterranean but not limited to it. The three countries with the highest danger are Spain, Portugal and Turkey. Greece, part of central and southern Italy, Mediterranean France, and the coastal region of the Balkans also show an increasing danger both in relative and absolute terms. At the same time, areas at moderate danger from forest fires are pushed north by climate change, up to central Europe. While, it is generally acknowledged that there should be relatively little change in fire danger as directly driven by climate change across northern Europe, recent summer fires in Sweden show however that, beyond modelling and projections, no European country is protected from the consequences of climate change.

In the UK, based on historical data, a study made in 2006 by the Department for Communities and Local Government[4] have estimated that: "*for a 1°C increase in summer temperatures, the Central England Temperature regression equations indicate an increase in the number of outdoor fires of between 24,000 and 40,000 per year for England and Wales and, for a 2°C increase, between 47,000 and 79,000. When these results are expressed as percentages, the rise in the number of secondary outdoor fires due to a 1°C summer temperature increase would be between 17-28% whilst a 2°C temperature change would lead to a 34-56% increase. Although these figures may appear unrealistically large, it should be noted that the increase in secondary fires in 1995 (+3.5°C), relative to the 1994 figure was 54% (+113,611 fires)*."

The increased number of fires will of course have detrimental effects on fire and rescue services, leading to extra workload, a deterioration of firefighter's working-conditions and increased risks for their safety. The main concerns include firefighters suffering heat stress, injuries due to uneven terrain, smoke inhalation and flying brands. Furthermore, large wildfires or heath fires can temporarily drain the fire cover of a large area, resulting in increased response times for primary fires and rescues. As underlined by an FBU (UK Fire brigade Union) report[5], "fire crews will be tired from attending more incidents, sickness and injury levels may rise due to fatigue, and equipment will be under more strain due to increased usage." Because of the nature of their job, two categories of workers seem to be particularly at risk: fire and rescue services located in rural areas (usually lower staffed) and firefighters working under the retained duty system (on-call work)[6].

The potential problems linked with the changing weather conditions require the adoption of appropriate responses to adapt, such as additional recruitments and investment into equipment (specialist firefighting appliances, water

[3] European Commission Joint Research Center (2018), Climate impacts in Europe, Final report of the JRC PESETA III project, available at: https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans

[4] The CLG report, Effects of Climate Change on Fire and Rescue Services in the UK (2006), available at: https://www.nationalfirechiefs.org.uk/write/MediaUploads/NFCC%20Guidance%20publications/Sector%20improvement/Climate%20change/CLG_Effects_of_Climate_Change_on_Fire_and_Rescue_Services.pdf

[5] Fire Brigade Union (FBU, 2010), Climate change – key issues for the fire and rescue service, available at: https://www.fbu.org.uk/publication/climate-change-key-issues-fire-and-rescue-service

[6] In the United Kingdom and Ireland, a retained firefighter, also known as an RDS Firefighter or on-call firefighter, is a firefighter who does not work full-time but is paid to spend long periods of time on call to respond to emergencies through the Retained Duty System

bowsers, portable dams, planes and helicopters that would assist with the rapid extinction of wild fires). Prevention measures, such as updated fire risks plans and regular and appropriate training, will also have to be enforced.

Extract from the CGIL fire brigade trade union's answer to the ETUC questionnaire

"The work of the Fire Brigades is very conditioned by climate change that affects the extreme phenomena that occur in the Italian territory traditionally very fragile. In particular, the increase in temperatures and droughts in the summer period leading to more widespread and intense fires, the strong, violent and concentrated rains and snowfalls in the winter period, natural disasters such as landslides, can only be addressed with a significant increase in the overall number of firefighters, which should be expected to rise from the current 35,000 (about 30,000 operational) to around 50,000; precisely because the working conditions and the safety of firefighters' operators will inevitably tend to get worse if their number is not soon increased".

2.2. Flooding

Increased flooding (coastal and river flooding) is likely to be one of the most serious effects from climate change in Europe over coming decades. According to the European Commission Joint Research Center[7]:

- Under present climate conditions, the estimated Expected Annual Damage (EAD) from coastal flooding for Europe is €1.25 billion, while the Expected Annual number of People Affected (EAPA) equals 102,000 people. Under a high-warming scenario, EAD for Europe is projected to reach €93 by the end of the century, with potentially 1.52 to 3.65 million people annually flooded due to extreme sea levels.
- At present, about 216,000 people are exposed each year to river flooding Under a high-warming scenario, this number could raise to 717,000 people annually exposed to floods while direct flood damages could see a more than three-fold increase with respect to current conditions.

Emergency and rescue services play three main roles during flooding: (1) emergency response and rescue, (2) damage mitigation and (3) making flooded areas safe before residents are permitted to return home.

Extreme weather events pose a variety of health and safety hazards to rescue workers, such as injuries from slips and falls and from being struck by airborne objects, inadequate sleep and nutrition because of long and uninterrupted work shifts, physical exhaustion, mental stress, and vehicular crashes. Other potential health and safety hazards associated with flooding is the exposure to toxic substances or contaminated flood waters (with chemical waste, oil, diesel, pesticides, fertilizers, etc.), asbestos and other hazardous dusts, mold, biological agents, flood debris, electrical hazards, drownings and blood-borne pathogen infections. Last but not least, climatic events may also be a source of important stress for workers (especially in certain sectors such as emergency and rescue services or crisis management units), with possible negative implications for them both at work (burn-out, increased workplace violence, etc.) and in their private life (depression, post-traumatic stress disorders, linked to activities during cleanup operations).

As in the case of fires, fire and rescue services may have to consider adapting their capabilities to allow for a greater flood rescue response capability. Here also, possible changes include recruitment of additional workforce, investment into new appliances an equipment (like for instance inflatable boats, powered outboards, personal protective equipment that are adapted to flooding conditions, etc.) and training.

[7] European Commission Joint Research Center (2018), Climate impacts in Europe, Final report of the JRC PESETA III project, loc. Cit.

Extract from TUC Fire Brigade Union (FUC) trade unions' answer to the ETUC questionnaire

"Climate change itself and adapting to climate change will require more jobs in the fire and rescue service. This has been well established by the FBU and other firefighter unions across the globe (for example the United Firefighters Union of Australia). The biggest attacks on jobs have come from governments disregarding the risks and imposing their austerity cuts. Some 12,000 firefighter jobs (20%) have been cut in the UK since 2010, despite the growing risks of climate change and the growing work done by firefighters at floods, wildfires and other weather events. The FBU has published several reports on flooding, indicating the extra work done by firefighters and the need for long term funding[8]".

2.3. Droughts

Climate change is going to lead to variations in precipitation levels, increasing therefore the risk of droughts, what can in turn result in lower water availability. According to the European Commission JRC, a general reduction in precipitation is projected in summer for all regions except Scandinavia and Eastern Europe. While winter precipitation is projected to increase over most of Central and Northern Europe, the southern regions of several Mediterranean countries should see declines in precipitation in both seasons.

Water shortages can affect brigades' training and demonstrative capabilities. Furthermore, water companies can reduce the pressure in their mains supplies to minimize leakage, so firefighters may have to relay water across longer distances from alternative water sources. All this can engender changes in training, tactics, procedures, and equipment. The aforementioned CLG report listed the following examples of changes that may become necessary:

- Increased use of foam concentrate and wetting agents to make less water go further. This could however lead to incidents becoming increasingly complicated as efforts to ensure contaminants are kept out of streams and rivers will be required more frequently;
- Fire appliances with larger water carrying capacities. Purchase or make arrangements for loan of specialized water moving equipment such as water tankers or additional high-volume pumping units;
- More efficient techniques / equipment for water application to fires, new techniques and equipment to allow long distance water relays to be carried out; and
- New techniques or equipment to allow water from smaller / shallower natural water sources to be used – watercourses are expected to be smaller in times of drought[9].

2.4. Heat waves

Heat waves have serious implications for firefighters. They affect the premises that firefighters work in – with offices and mess rooms too hot to work in. Special measures have to be implemented to ensure fire stations are adapted. Heat waves also affect the conditions in which firefighters carry out rescues. Risk assessments on business and domestic premises need to account for more extreme temperatures. Early warning systems have to be setup and adapted Personal Protective Equipment (PPE) provided[10].

[8] See for example: FBU, *Inundated: The lessons of recent flooding for the fire and rescue service*, available at: https://www.fbu.org.uk/publication/inundated-lessons-recent-flooding-fire-and-rescue-service

[9] CLG (2006), loc. cit.

[10] FBU (2010), loc. cit.

3. The impacts of climate change on human health and their implications for health care sector

Climate change is a significant threat to European people's health. As climate continues to change, risks to human health will continue to grow, impacting millions of people and therefore putting under additional pressure on health care and medical services, which are already facing budget cuts and personnel shortages in most of EU countries.

3.1. The impacts of climate change over human health

The impacts of climate change on human health are often discussed as primary, secondary or tertiary, depending on the causal pathway through which that impact occurs[11]:

- **Primary effects** are those due to direct exposure to excessive heat or the physical hazards of extreme weather (like physical injuries during storms or flooding). Acute health effects of exposure to heat stress include heat exhaustion, heat rash (prickly heat), heat fatigue, heat syncope/fainting and heat stroke. It can also lead to complications of many chronic diseases, including chronic obstructive pulmonary disease, coronary artery disease, diabetes mellitus, and chronic kidney disease.

- **Secondary effects** are those resulting from disruptions of surrounding ecosystems in turn could lead to a modification of biological risks, such as the development of infectious, immuno-allergic and toxic diseases. Climate change is for instance broadening the range of disease vectors (such as ticks and mosquitoes) and favoring the development of pathogens out of areas usually recognized as contaminated. Furthermore, it is also said to increase pollen production and pollen seasons, thus leading to increases in allergic disorders among workers and others.

- **Tertiary effects** are those resulting from the disruption of social, political, and economic systems, producing dislocation or even violence.

There are additional health impacts that are not necessarily the result of climate change, but that are closely associated with the physical and chemical processes of our fossil fuel-driven economy. These include greater health risks from higher air pollution levels (from burning of fossil fuels in many cases) as well as increased exposure to UV radiation as a result of depletion of the ozone layer.

Although it is very difficult to assess how many climate-related deaths have already occurred, climate change impacts over human health are already visible in Europe. The 2003 heat wave is for instance said to have killed 70.000 across the EU, from which around 20.000 in France. This trend should continue in the future. According to the 2019 report of The Lancet Countdown on health and climate change[12], unless warming is slowed down urgently and appropriate action is taken, about 350 million Europeans could be exposed annually to adverse climatic extremes by the end of the century [compared to 25 million in the early years 2000]. Under a 3°C scenario, the number of deaths related to disasters associated with climate change in Europe would be multiplied by 50, from 3000 annual deaths between 1981 and 2010 to 152 000 at the end of the century.

3.2. Budgetary cuts and personnel shortages

Europe's 18.6 million health and care workers represent 8.5% of the total workforce. The number of workers in this sector continues to grow, with an increase of 13% between 2008 and 2016. This growth has led to the net creation of 2.1 million jobs, which represents the largest absolute increase of all economic sectors during this period, with a particular increase in the number of medical doctors. According to analysis from the European Centre for the

[11] S. Sweeney, J. Treat (2019), Nurses' Unions, Climate Change and Health: A Global Agenda for Action, available at : http://unionsforenergydemocracy.org/tued-bulletin-90/

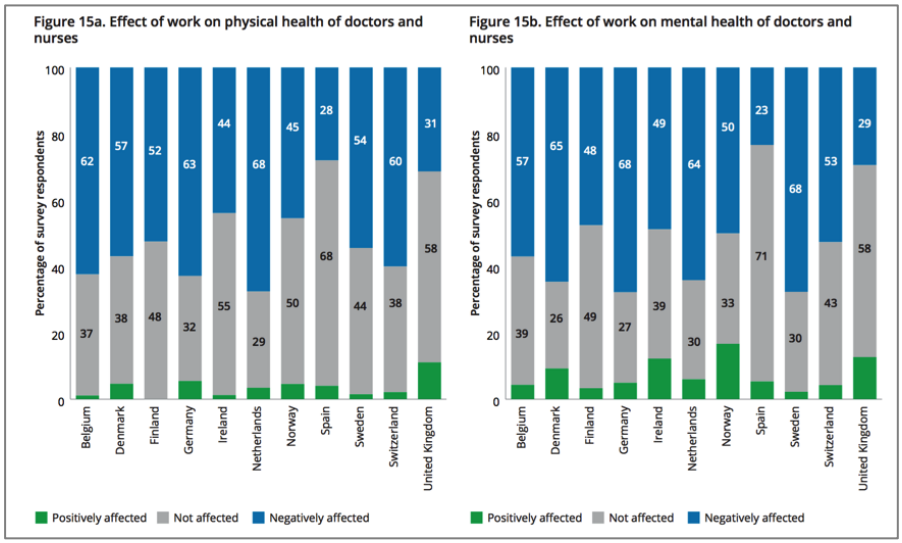
[12] https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32596-6/fulltext

Development of Vocational Training (Cedefop), this trend is expected to continue, with the creation of about 1.8 million additional jobs between 2015 and 2025 (+7.8%).

Despite this, the EU health care sector can be seen as being in crisis and is being challenged from different directions. First of all, the sector is confronted not only to climate change but also to other megatrends such as the **migration crisis** and the increasing life-expectancy. The **ageing population** for instance raises the need for more care and for the development of new primary care models and better integrated care. This poses a serious challenge due to the raising number of patients and the rise in associated costs.

In the meantime, EU health care systems are confronted to **budgetary constraints**. According to Eurostat most recent available data, health care expenditures have slightly risen in almost all EU Member during the period 2011 -2016[13]. This rise appears however to be insufficient to meet the growing demand. The available hospital data for the period 2011 – 2016 show that the number of hospital beds has decreased dramatically, and length of stay has shortened in 10 out of 13 EU countries. Eurostat data show also major differences between EU countries, with health care expenditure per capita ranging from more than 4000€ in countries such as Luxembourg, Sweden and Denmark to around 500 € in Bulgaria and Romania. Within many Member States, moreover, accessibility is further affected by an uneven geographical distribution of health professionals, with shortages in rural, isolated areas and deprived urban areas.

Figure 1 - Perceptions of hospital doctors and nurses about the effect of work on their physical and mental wellbeing (source: Deloitte)



Lately, several protests have taken place in different EU member states in order to denounce the insufficient level of public funding, which results in low-wages, under-staffing, increased workload and decreased working conditions. A 2017 Deloitte study on the state of the health care sector[14] has pointed out growing concerns over nurses and doctor's workload in the EU as well as its' detrimental effect over their physical and mental health (see figure 1 above).

All these elements are causing **severe personnel shortages**. The World Health Organization (WHO) predicts a health professional shortfall of up to two million (or 15 per cent of the workforce) across the EU by 2020. Several Eastern European countries, such as Latvia, Lithuania, Poland, Romania, the Slovak Republic, Croatia, Bulgaria and Hungary, face major challenges in retaining health professionals due to low levels of wages and public financing. With 8.4

[13] https://ec.europa.eu/eurostat/statistics-explained/index.php/Healthcare_expenditure_statistics

[14] Deloitte (2017), Time to care - Securing a future for the hospital workforce in Europe, available at : https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/time-to-care.html

practicing nurses and 3.6 practicing doctors per 1000 population, the EU has an average nurse to physician ratio of about 2.5. But this ratio varies from 1.1 in Bulgaria to 4.6 nurses per doctor in Denmark and Finland. In some countries, advanced practice nurses now assume certain tasks that were traditionally the remit of doctors. Last but not least, the sector also faces skills mismatches and is confronted to an ageing workforce. The share of people above 50 years working in the sector increased from 27.6% to 34.1% between 2008 and 2016, which is a faster pace than observed across all sectors on average (24.0% to 29.6%)[15].

Climate change related impacts over human health will seriously impact the EU medical and health services, adding extra-work-load to a sector already understaffed and, in many Member States, underfinanced. Health is however a universal human-right. Public financing must be secured in order to guarantee proper levels of workforce (nurses, doctors, administration, rescue services, etc.), investment and training. This is the only way to ensure acceptable working conditions for workers.

4. Adaptation policies

4.1. Adaptation to climate change

Climate change adaptation can be defined as the process of adjustment of a society or a natural system to the evolution of weather conditions caused by global warming, aiming at lowering the risks caused by these evolutions and exploiting their potential beneficial opportunities. The primary objective of adaptation measures is of course to reduce climate vulnerability of specific regions, sectors and populations.

These measures can for example consist in investment in infrastructure to protect against natural disasters (urban and coastal planning, defenses against sea-level rise, improving the quality of road surfaces to withstand hotter temperatures, etc.), development of resource efficiency management systems (energy, materials, circular economy), behavioral shifts, (individuals using less water, increased use of air-conditioning, farmers planting different crops and more households and businesses buying flood insurance) or strengthening social protection systems and adopting of adequate prevention measures (e.g. Investments in firefighting equipment, hiring additional staff, etc.). Adaptation policies help reduce the costs associated to climate change. According to the Commission, every euro spent on flood protection could save €6 in damage costs.

4.2. EU Adaptation Strategy

In April 2013, the European Commission adopted the EU adaptation strategy[16][17], which is based on 3 main objectives: promoting action by Member States, better informed decision making and promoting adaptation in key vulnerable sectors. Since then, 25 out of 28 of them had adopted NASs by early 2018[18]. Despite all the forthcoming challenges, EU adaptation strategies do not say much about the risks faced by emergency and rescue services.

4.3. The evaluation process of the EU Adaptation strategy

In 2019, the European Commission has carried out a review process of its' adaptation strategy. According to the Commission, the Strategy delivered on its objectives, with progress recorded against each of the eight individual actions. In particular, it is estimated that the Strategy promoted strong action by Member States, shifted some political focus towards adaptation issues and the need for prevention and preparedness, and that it has increased awareness among a broad range of EU Member States.

Several gaps however have also been identified. First, progress in the adoption of local adaptation strategies has been slower than expected. Better downscaling of adaptation knowledge might be required, notably on socio-

[15] https://ec.europa.eu/health/state/companion_report_en
[16] https://climate-adapt.eea.europa.eu/eu-adaptation-policy/strategy
[17] A review process has been launched in 2018 as adaptation is now more urgent than forecast in the EU's 2013 adaptation strategy
[18] Strategies are being developed in the remaining three Member States (Latvia, Bulgaria and Croatia) but have not yet been adopted.

economic impacts and possible responses. Regarding infrastructure, major projects are now required to be climate proof. Further work on preparedness and standards is ongoing but might not deliver results before 2020. There is also some margin to improve implementation and monitoring. The strategies lack of meaningful indicators to monitor the socio-economic impacts of adaptation strategies and to assess the value of the prevention and management of risks linked to climate change. Finally, and as underlined by the EPSU study "Public services and adaptation to climate change" [19], the different strategies are characterized by an "absence of stable and systematic public financing, at both national and municipal levels. Some of the sectors or subsectors that have been given priority in national adaptation strategies are public, such as coastal infrastructure, flood protection and general public infrastructure. However, in the overwhelming majority of cases, this aspect is not specially addressed, and no special financial arrangements are specified. In 2014, the BASE adaptation strategy review[20] has shown that only 3 national adaptation strategies have specifically addressed the issue of emergency services (see figure 2 below). Public services need to be strengthened in line with the growing adaptation challenges. This includes recruiting new staff and equipping public sector workers such as nurses and doctors, fire fighters and other emergency workers with the skills required to ensure risk preparedness in order to cope with enhanced climate risks".

Figure 1 - Sectors identified as vulnerable in selected national adaptation strategies (2014)

Vulnerable sector	DE	DK	ES	FI	FR	LV	NL	PT	SE	UK
Agriculture	•	•	•	•	•	•	•	•	•	•
Biodiversity	•	•	••	•	••	•	•	•	•	•
Energy	•	•	•	•	•	••		•	•	•
Finance	•	•	•	•	•	•	•	•		•
Forests	•	•	•	•	•	•	•	•	•	•
Health	•	•	•	•	••	•		•	•	•
Water management	•	•	••	•	••	•	••	•	•	•
Construction	•	•	•	•	•		•	•	•	•
Fisheries	•	•	•	•		•		•	•	•
Coastal areas	•	•	••			•	••	•	•	•
Tourism	•		•	•	•		•	•	•	•
Land use	•	•		•			••	•		•
Transport	•	•	•	•	•				•	•
Communication infra-structure	•	•	•						•	
Industry	•		•	•	•					•
Emergency services	•	•				•				
Mountains	•		•							

Source: BASE 2014, PEER (2009). Note: • sector is dealt with; •• identified as a key sector in the national strategy

4.4. Example of adaptation measure related to emergency services - RescEU

In December 2018, The European Commission's proposal to strengthen the EU's collective response to natural disasters, known as RescEU, has entered into force. The upgraded EU Civil Protection Mechanism establishes a new European reserve of capacities (the so-called RescEU reserve), including firefighting planes and helicopters, while boosting disaster prevention and preparedness measures. RescEU can also be activated in the future to respond to medical, chemical, biological, radiological and nuclear emergencies. To ensure that Europe is prepared for this year's forest fire season the new legislation includes a transition phase during which participating States can get funding in exchange of putting their firefighting means at the disposal of the EU. The text is based on two axes: (1) reinforcement of the European reaction capacities, (2) Increased prevention and preparedness for disasters. The

[19] https://www.epsu.org/article/epsu-feature-adaptation-climate-change
[20] https://www.ecologic.eu/10882

budget impact of the proposal is estimated at EUR 280 million for the remainder of the pluriannual financial framework period up to 2020, which will be in addition to EUR 368.4 million, already included in the multiannual financial framework under the European Civil Protection Mechanism.

5. Conclusion

The expected impacts of climate change over emergency and rescue services are huge. The multiplication of extreme-weather events, such as fires, coastal and river flooding, droughts, heat waves, storms, will add extra-work load to fire-fighters, impacting their working conditions and safety at work. These events, together with all the other impacts of climate change upon human-health, will also put under high pressure the health care and medical sectors which already face severe personnel shortages and budgetary constraints. In the meantime, national adaptation policies very often lack of concrete measures. In the vast majority of cases, these strategy papers make no mention of financial feasibility in the context of tightened public finances under austerity. This raises the question: how can the declared objectives be put into practice at a time of massive budget cuts? The crucial role of the public sector in adaptation is not mentioned and the challenges facing public services are not specifically addressed. Regarding emergency and rescue services, only few national adaptation strategies specifically address emergency and rescue services (Denmark, Germany, Latvia for example). In this context, trade union action is needed to ensure proper levels of funding, recruitment, investment and training. Adaptation measures should be taken with the participation of trade unions to the design, implementation and monitoring of climate adaptation policies.