



Food and Agriculture
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United Nations

Comprehensive analysis of the disaster risk reduction and management system for the agriculture sector in **Serbia**

Enhancement of Disaster Risk Reduction and Management (DRRM) capacities and mainstreaming Climate Change Adaptation (CCA) practices into the Agricultural Sector in the Western Balkans (TCP/RER/3504)



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Food and Agriculture Organization of the United Nations
Belgrade, 2018

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Contents

Acknowledgements	v
Acronyms	vi
Introduction	1
Natural hazard profile.....	2
National legislation and sectoral policies, plans and strategies	8
Main stakeholders, roles and responsibilities for DRR/M at all levels.....	16
Early warning systems	22
Post-disaster needs assessment	24
Assessment of the disaster impacts	26
Hazard, risk and vulnerability assessments and mapping.....	27
References	39

Figures

Figure 1 INFORM Risk Index in the Western Balkan countries.....	2
Figure 2 Frequency by type of hazards in Serbia, 1990-2014.....	3
Figure 3 Combined economic losses by type of hazards in Serbia, 1990-2014.....	4
Figure 4 Nationally reported losses in terms of mortality 1990-2014.....	5
Figure 5 Structure of the Sector for Emergency Management.....	16
Figure 6 Overview of operational linkages of RHMSS with other institutions regarding DRR.....	21
Figure 7 An overview of the applications filed for agricultural insurance premium subsidies.....	33
Figure 8 An overview of the amount of funds granted for agricultural insurance subsidies.....	33

Tables

Table 1 Warnings for natural hazards in Serbia.....	23
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Acronyms

CBD	Convention on Biological Diversity
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
EC	European Commission
ECMWF	European Centre for Medium-Range Weather Forecasts
EFAS	European Flood Alert System
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNI	Gross National Income
GNP	Gross National Product
NDRMP	National Disaster Risk Management Programme
NTC	National Training Center
NWP	Numerical Weather Predictions
PIMO	Public Investment Management Office
RHMSS	The Republic Hydrometeorological Services of Serbia
SEM	Sectoral for Emergency Management
SPI	Standard Precipitation Index
UNFCCC	United Nations Framework Convention on Climate Change
WD	Water Directorate

Introduction

Serbia is exposed to various natural hazards, including earthquakes, floods, landslides, droughts, wild fires and storms. The floods that occurred in May 2014 were recorded as the worst floods since records were kept 120 years ago, which affected 38 municipalities. In 24 most affected municipalities post disaster needs analysis estimated the total damages and losses to all sectors w at EUR 1.5 billion, of which EUR 228 million or 15 percent was the impact of the floods on the agriculture sector.¹ Not only floods, but also e.g. landslides and drought are impacting the agriculture sector extensively.

The country is currently shifting from a reactive emergency response-oriented approach towards one that is more focused on proactive disaster risk reduction. The devastating floods of 2014, which heavily affected Serbia has indicated the importance of adopting a more strategic approach towards natural hazards and has resulted in the mobilization of government, ministries, municipalities and other stakeholders to put more efforts into creating a system that mainstreams disaster risk reduction and management into current policies and practice, but also implements effective and efficient post-disaster activities.

This document provides an overview of the current strengths, gaps and capacity needs of the disaster risk reduction and management system for the agriculture sector in Serbia. In addition, it includes recommendations for strengthening and enhancing the existing institutional system to build resilience of farming communities to current and future shocks and stresses, such as natural hazards and climate change.

This report has been conducted through the collection of secondary data via a desk study and literature review of relevant policy and strategy documents, reports, articles and databases, which provided insights in to the implementation of disaster risk reduction and management interventions and measures, in particular for the agricultural sector, in Serbia.

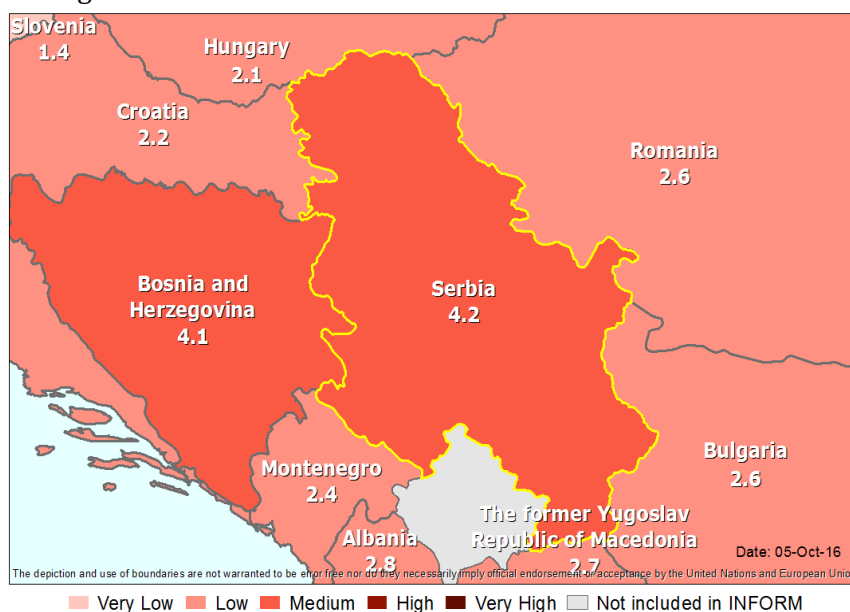
This document is one of the outputs of the “Enhancement of Disaster Risk Reduction and Management (DRRM) capacities and mainstreaming Climate Change Adaptation (CCA) practices into the Agricultural Sector in the Western Balkans” project (TCP/RER/3504), which objective is to increase resilience of farming communities to natural hazards, in particular floods, landslides and drought. The project aims to strengthen institutional mechanisms as well as technical capacities of relevant agriculture stakeholders to better plan and implement risk reduction measures in agriculture.

¹ UN/EU/World Bank Group, 2014

Natural hazard profile

According to the INFORM Risk Index of 2017², Serbia is highly exposed and vulnerable to natural hazards. The major natural hazards to which the country is exposed to include, among others, (flash and river) floods, storms, drought, landslides and earthquakes. As well as epidemic livestock diseases and the emergence of pests, which may cause significant damages and losses to people and animals. As can be seen in Figure 1 below, Serbia is among the highest exposed and vulnerable among the Western Balkan countries. It ranks at 71 on the INFORM Risk Index, which is also the highest score in the region with regard natural hazards and humanitarian crises and disasters.

Figure 1: INFORM Risk Index in the Western Balkan countries



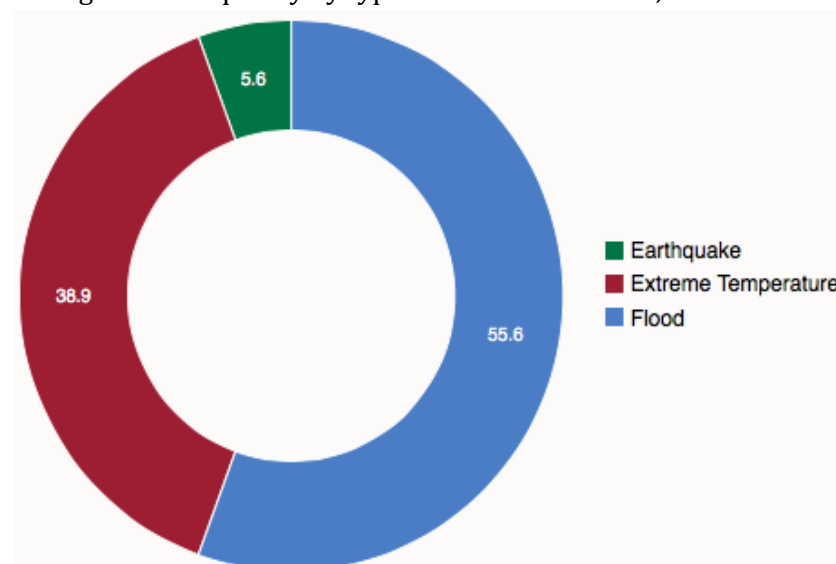
Source: <http://www.inform-index.org/>

The risks are not equal across the entire territory and varies depending on the type of hazard, exposure, vulnerability and coping capacity. However, floods are the main hydro-meteorological hazard in the country as shown in figure 2. The valleys of larger water courses, in which the settlements, farmland, infrastructure, and industry are located, are highly prone to floods, which are occurring most frequently in the Vojvodina region and along the river courses of the Sava, Drina, Velika Morava, Juzna Morava and Zapadna Morava. River floods in the major river basins are caused by long periods of rainfall and/or the intensive melting of snow. Flash floods can occur in the smaller river basins and are caused by short intensive rainfall, mostly due to summer storms. In addition, other factors contribute, such as lack or limited maintenance of embankments and/or flood defences, debris and sediments blocking river, drainage or diversion channels that

² This index measures the risk of humanitarian crises and disasters. Data is available for 191 countries and it is free and open to all. The index uses 50 different indicators for hazard & exposure, vulnerability and lack of coping capacity. For more information see <http://www.inform-index.org/Portals/0/InfoRM/INFORM%20Global%20Results%20Report%202017%20FINAL%20WEB.pdf?ver=2016-11-21-164053-717>

reduce the capacity of river flows and so on. In addition, the use of certain type of agricultural practices, such as water, soil and land management techniques, may also have an impact of floods (flash floods or surface water flooding) and sediments.

Figure 2: Frequency by type of hazards in Serbia, 1990-2014



Source: CRED EM-DAT, 2015

Extreme rainfall during April and May 2014 led to the worst flooding in over a century and significantly affected 24 municipalities. The total damages and losses to all sectors were estimated at EUR 1.5 billion, of which EUR 228 million or 15 percent was the impact of the floods on the agriculture sector. The damages to the sector were calculated to be EUR 107.9 million and EUR 120.1 million in losses. The recovery and reconstruction needs for the sector were estimated at EUR 152.1 million, of which EUR 40.8 million and EUR 111.4 million for recovery and reconstruction respectively.³

Droughts are most prevalent in the eastern part of the country and the Pannonian Basin in the north; catastrophic droughts occurred in Serbia three times in the last 20 years. According to temperature and precipitation data during the period of 1991-2010 as well as the average maize yields, the extremely dry years included 1992, 1993, 1998 and especially 2000, 2003 and 2007.⁴ During the period of April to September in 2009, a severe drought affected Sremska Mitrovica, while Central Serbia was also affected by drought.⁵ In 2012, the country was again hit by a drought during the summer, with estimated losses in agricultural production of round USD 2 billion, of among others, corn (USD 1 billion), sugar (USD 130 million), soybeans (USD 117 million), fruits and vegetables (USD 100 million), sunflowers (USD 55 million) and other agricultural crops

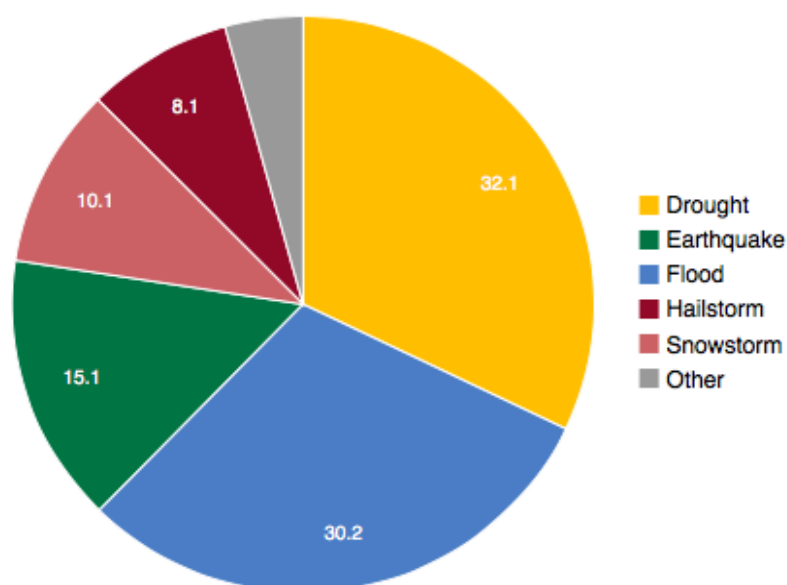
³ UN/EU/World Bank Group, 2014

⁴ WMO/UNCCD/FAO and UNW-DPC, 2013

⁵ Đuričin, S. and Bodroža,

(USD 600 million).⁶ Droughts have caused more economic losses than floods during the period of 1990-2014 in Serbia as shown in the below figure 3.

Figure 3: Combined economic losses by type of hazards in Serbia, 1990-2014



Source: CRED EM-DAT, 2015

According to WMO, UNCCD, FAO and UNW-DPC (2013) report, the mean annual economic losses as a result of floods on agriculture are estimated between € 38.75 to 106.25 million, whereas for the impact of droughts on agriculture is calculated at about € 500 million.⁷ These data show that the impact of drought on agriculture is much higher than for floods. However, due to the limited available post-disaster damage and losses data for the agriculture sector, especially for droughts, these figures and percentages mentioned earlier are all estimations.

Mainly triggered by droughts, but also due to human causes, wildfires are equally frequent and widespread during the dry summer season, threatening the 28 percent of the Serbian territory that is covered by forests. Between 1998 and 2008, 853 forest fires burned an area of 16 357 ha and 258 forest fires were counted in 2007 alone, causing damages of approximately EUR 40 million and burning more than 5200 ha.⁸

The average annual loss caused by all hazards are estimated at nearly USD 400 million per year.⁹ Highest mortality losses by hazards are caused by fires, followed by snowstorms and floods as observed during the 1990-2014 period and shown in figure 4.

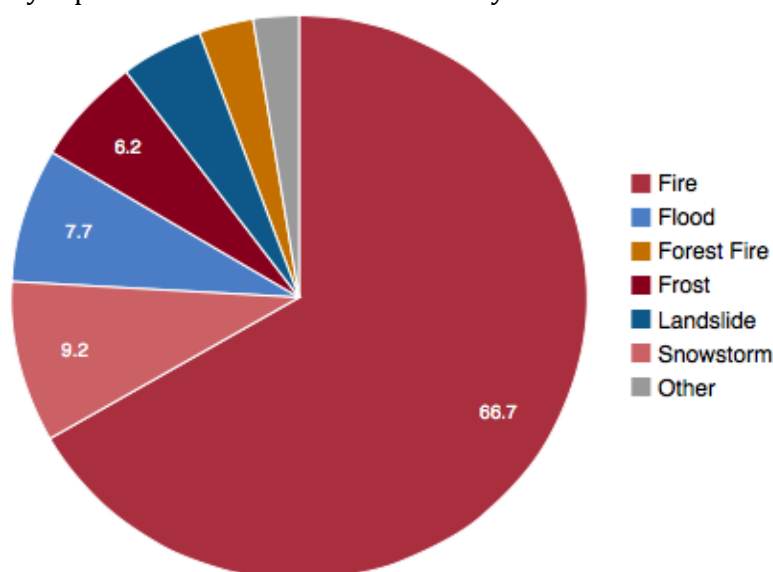
⁶ USDA Foreign Agricultural Service, 2012

⁷ WMO, UNCCD, FAO and UNW-DPC, 2013

⁸ http://botanicaserbica.bio.bg.ac.rs/arhiva/pdf/2009_33_2_499_full.pdf

⁹ <http://www.preventionweb.net/countries/srb/data/>

Figure 4: Nationally reported losses in terms of mortality 1990-2014



Source: CRED EM-DAT, 2015

Serbia has a range of flood protection and control infrastructure, which aims to prevent and mitigate the impacts of floods. The country's flood-prone areas cover around 1.6 million hectares, which includes over 500 larger settlements, more than 500 large commercial buildings, around 1 200 km of railway and more than 4 000 km of roads.¹⁰ In order to protect against flooding, over 3 400 km of embankments have been built and river regulation of about 420 km has been completed. However, during the past years, investments for the maintenance of facilities and riverbeds have reduced. As a result, due to the lack of maintenance of riverbeds, embankments of waterways are highly exposed and at risk of flooding.

Climate change

Climate change projections estimate the increase in frequency and intensity of natural hazards, such as floods and droughts as well as in terms of scope and duration. A substantial number of studies predict increase in intensity and frequency of flooding, particularly in the winter season. Climate change is expected to affect water resources. An assessment on the effects on water resources indicates a general decrease of water flow at the national level of 3 percent per 10 years, caused by a decrease in annual precipitation.¹¹ However, at the same time the number of extreme weather events, including heavy and excessive rainfall is expected to increase due to climate change.

¹⁰ <http://www.climatechange.post.com/serbia/river-floods/>

¹¹ <http://www.klimatskepromene.rs/uploads/useruploads/Documents/Da-li-je-casa-pola-puna-ili-prazna.pdf>

Agriculture profile

Agriculture is a highly important economic sector for Serbia, as it accounts for about 8.2 percent of the total Gross Domestic Product (GDP).¹² Agricultural products account for over 20 percent of national exports. Its main export products include, among others, maize, wheat, apples and frozen raspberries. An estimated 40 percent of the total population lives in rural areas¹³, where one in every five residents is older than 65 years, while in the southern and eastern parts of the country it is one in every four residents.¹⁴ In terms of education, the rural population, compared to the urban population, has a large share of people who do not have any education or only completed primary school. It is estimated that approximately one third of the rural female population did not attend any school or unfinished or finished primary school.¹⁵ It is estimated that around two thirds of the people fully or partially depend on agriculture or forestry for their livelihoods, while according to official statistics, approximately a fifth of the working population is employed in the agricultural sector¹⁶. Serbia has an unemployment rate of 17.6 percent (2014) and a youth unemployment of 43.2 percent (2015)¹⁷.

In some regions of Serbia, agriculture is a core economic activity and most of the residents depend on it for basic livelihoods, for instance the southern and southeastern regions of the country are among the poorest, while the Vojvodina region in the north is relatively more endowed as it is largely based on the developed food and agriculture industry as it is rich in fertile loamy loess soil. It is also characterised by large agricultural commercial companies and cooperatives, which have, over half of them, between 50 to 2 500 hectares.¹⁸ The agricultural sector remains important to the economy, however, it is expected that the sector's contribution to GDP will continue to decline, as other sectors of the economy continue to develop.

The natural potential for development of agricultural production is significant. Climatic conditions are favourable and Serbia is endowed with considerable water resources for further development of its agriculture production. More than half of the country's territory is classified as agricultural land (4 867 000 ha) with the area of utilized agricultural land to be 3 437 000 hectares.¹⁹

At the moment, policy reform with regard to the harmonization with the EU's Common Agriculture Policy is ongoing, including the set up of administrative structures that will

¹² World Bank data, 2015

¹³ <http://uap.gov.rs/wp-content/uploads/2016/05/STRATEGIJA-2014-2020-.pdf>

¹⁴ Ministry of Agriculture and Environmental Protection, Republic of Serbia, 2009

¹⁵ Ministry of Agriculture and Environmental Protection, Republic of Serbia, 2009

¹⁶ <http://uap.gov.rs/wp-content/uploads/2016/05/STRATEGIJA-2014-2020-.pdf>

¹⁷ Eurostat, [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Employment_and_unemployment_rates,_2005,_2010_and_2015_\(%25\).png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Employment_and_unemployment_rates,_2005,_2010_and_2015_(%25).png)

¹⁸ FAO, 2009

¹⁹ Ministry of Agriculture and Environmental Protection, Republic of Serbia, 2009

¹⁹ <http://www.climatechange.org/serbia/river-floods/>

allow Serbia to use the EU's IPARD funds for agriculture. In parallel, the rural areas are faced with persistent depopulation as a result of rural-urban migration, poverty in certain parts of the farming communities and insufficient development and maintenance of rural infrastructure as well as the weakening of farmers' competitiveness due to, among others, small scale farms and businesses, low technology, limited business skills. The small farm size, which is on average about 4.5 hectares and only 22 percent of agricultural household farm more than five hectares, delays the development of the agricultural production and reduces the competitiveness of agricultural producers.²⁰ As a result, there is little capacity for commercial production and farmers remain vulnerable to all kind of shocks, such as the impact of natural hazards and climate change.

Agricultural production is about 60 percent in Serbia with arable farming being dominant, followed by animal husbandry (about 30 percent), pomiculture (8 percent) and viniculture (almost 2 percent). The most common field crop is maize, which makes up a half of the sown area. It is followed by wheat, sunflower, alfalfa and soya etc. Orchards make up almost 5 percent of total arable land (approximately 250 000 ha), with apples, plums, sour cherries and raspberries as the most common fruits grown. In the last several years, a relatively steady production level has been observed.

Livestock production has been facing a decline over the last decades. In the structure of gross realized value, the share of plant and livestock production in Serbia is 70 and 30 percent respectively. This is opposite from the agriculture sector of EU countries, where approximately 70 percent of value originates from livestock production and 30 percent from plant production.²¹

Milk production contributes around 8 percent of the value of agricultural production. In Serbia, the herd size is on average 2.8 dairy cows. Although the majority, approximately 70 percent, has between 1-2 cows with one in four farms producing cow milk. Even though, the number of cattle decreased, average milk production per cow has increased by less than 8 percent in comparison to 2008, which is around 3 200 liter in 2013.²² Overall, the livestock sector has great potential, due to the favourable conditions for the production of animal feed and fodder.

Climate change

One of the most vulnerable sectors to climate change is agriculture, followed by, among others, energy and water management. Climate change will likely affect agricultural production and primarily plant production as a result of temperature and precipitation changes, which will adversely affect yields. The incidence of various types of diseases and parasites may increase and spread due to climate change. The frequency and severity of

²¹ <http://www.pks.rs/PrivredaSrbije.aspx?id=13>

²² Ministry of Agriculture and Environmental Protection, Republic of Serbia. 2014.

extreme weather events is also expected to increase, such as floods, which may result in more soil erosion, but also storms, droughts and other natural hazards.

Vojvodina region, which is the most important agricultural area in Serbia, is considered to be more vulnerable to extreme weather conditions and systematically modified weather conditions than other regions in the country. This is characterised by increased variation, in particularly regarding precipitation. Climate change forecasts conducted for this region, estimate that the mean annual air temperatures are likely to increase by 1.3 degrees in 2040 and 2.4 degrees in 2080 compared to 1985-2005²³, which may have adverse impacts on crop yields. It is calculated that the yield of winter wheat in Vojvodina could be reduced with 5-8 percent and 4-10 percent in 2040 and 2080 respectively, compared to the average yield during the period of 1981-2005.²⁴

Besides the increase in extreme weather events, prolonged vegetation seasons due to increased winter or early spring temperatures may result in higher possibility of disease or insect occurrence. While, some types of insects, particularly those that depend on soil moisture, may show lower incidence levels and population due to longer dry periods.

Different economic sectors show various levels of vulnerability to natural disaster and extreme weather events. Weather-dependent sectors are those most dependent on weather conditions and, at the same time, are critical to the national economy (high GDP share). The share of sectors that depend on weather conditions, which include the energy and water sectors, among others, contribute almost 50 percent to the Gross National Product (GNP) of Serbia.²⁵

National legislation and sectoral policies, plans and strategies

National legislation

The Law on Emergency Situations ("Official Gazette RS", 111/09; 92/2011; 93/2012) considers disaster risk reduction and management important and defines natural and other hazards as:

*"a natural or a human-induced event whose consequences threaten lives and health of a large number of people or material goods and environment in a broader context (e.g. floods, earthquakes, landslides, prolonged droughts, hailstorms and/or strong winds, fire, epidemics, massive contamination of soil, water and air, technical and technological accident, war destruction, act of terrorism, etc.), and whose occurrence or consequences are impossible to prevent or eliminate through regular actions of competent authorities and agencies."*²⁶

²³ <https://www.climatechangepost.com/serbia/climate-change/>

²⁴ WMO, 2012

²⁵ http://www.meteoalarm.rs/eng/damage_from_natural_disasters2.pdf

²⁶ Law on Emergency Situations, 2009: 1 (Page 1: Section I, Article 2, Paragraph 1)
<http://www.seesac.org/f/tmp/files/failovi/547.pdf>

In addition, this laws mentions when a state of emergency is declared, namely:

“when the risks and threats or the actual consequences of natural and other hazards for the population, environment and material goods are of such scope and intensity that the occurrence or consequences thereof cannot be prevented or eliminated through usual activity of the competent authorities and agencies, thus requiring use of special measures, forces and resources, intensifying their operation mode, for the purpose of mitigation and elimination thereof.”²⁷

A state of emergency is lifted following the cessation of the conditions, which were the reason for the declaration. The laws also describe the authority that shall declare and lift a state of emergency per territory as follows:

- 1) By the government, for the territory of the Republic of Serbia;
- 2) By the executive body of the autonomous province, for the territory of the autonomous province;
- 3) By the mayor, for the territory of a city and by the president of the municipality, for the territory of a municipality.

Protection and rescue activities fall under the authority of the crisis management headquarters, which can be formed at Republic level, province level or local self-government level, depending on the affected territory(ies).

The Law on Emergency Situations was adopted in 2009, with amendments introducing risk reduction aspects in 2011 and 2012, it defines the roles and responsibilities of all relevant actors in the system, such as of citizens, state agencies, autonomous provinces, local-self government, companies, and other organizations, as well as international cooperation and other issues related to the structure and functioning of the system. It also outlines activities, like the need to develop risk assessments and based on those create disaster risk reduction plans for local government, provinces and the republic as a whole.

Additionally, a new Law on Natural and other Hazard Risk Reduction and Emergency Management has been drafted, but has not been adopted yet by the Serbian Parliament. This Law places more emphasis on DRR/M and promotes risk reduction of natural and other hazards, including prevention, mitigation and preparedness to respond, protection and rescue activities across different sectors, thereby aiming to strengthen individual and community resilience to these hazards. It outlines the rights and obligations of citizens, associations, local self-government units, autonomous provinces and the Republic of Serbia as well as promotes the international cooperation, administrative inspection and other issues relevant to structure and functioning of the system.

The law also takes gender into consideration as it is based on the principle of human rights, thereby ensuring protection of human rights, gender equality and also other

²⁷ Law on Emergency Situations, 2009: 23 (Page 23: Section V, Article 46)

vulnerable groups, such as the protection of the poor, old, children, disabled persons, refugees and displaced persons among others.

The development of risk reduction plans is mentioned in article 15 of the Draft Law on DRRM. This law states that “the risk reduction plans shall be the plans of specific preventive, organisational, technical, financial, normative, supervisory, educational and other measures and activities that are relevant to public authorities and other parties. On the basis of the assessment of certain risks, these plans shall be undertaken in order to reduce future risks of natural and other hazards and mitigate their consequences.” Furthermore, it is mentioned that “risk reduction plans shall be adopted separately for the territory of the Republic of Serbia (*National Plan of Natural and Other Hazard Risk Reduction*), autonomous province (*Provincial Plan of Natural and Other Hazard Risk Reduction*) and local self-government unit (*Local Plan of Natural and Other Hazard Risk Reduction*), whereas the measures and activities stipulated therein shall be harmonized.” It is also defined that the risk reduction plans shall be adopted for the period of one, five or ten years and may also be adopted for certain natural and other hazards in particular, such as a flood risk reduction plan, etc.

The drafted Law on Disaster Risk Reduction and Management, proposes the creation of a separate body, the Directorate for Risk and Emergency Management, which is a centralised entity to manage disaster risk reduction, resiliency building and recovery actions as well as the establishment of National Platform for DRRM.

As a result this new DRRM law, Serbia is currently in the midst of a transition from an “old” system that is very much focused on emergency response towards a more proactive system, which not yet formalized, but more focused on disaster risk reduction and management and resilience building.

Other relevant laws include the Law on Local Self Government ("Official Gazette RS ", 129/2007, 83/2014 – as amended and 101/2016), which defines as one of the major responsibilities of local government the assurance of safety for all its citizens. However, the Law relates to DRR and emergency management only in one of its articles, stating that the municipality is “...obliged to organize, through its units, and in accordance with the Constitution and legislation, protection from hazards and other threats as well as fire protection, providing mechanisms for its reduction and mitigation of its consequences” (Article 20).

The Law on Water ("Official Gazette RS", 30/2010, 93/2012 i 101/2016) includes several articles that regulate risks and potential threats arising from water, which are consistent with the Law on Emergency Situations. It defines measures to be taken in order to protect watercourse as well as criteria for the determination of flood prone and erosion zones. It

recognizes “waters of first and second level”²⁸, identifying responsibilities for its protection (public water management enterprises for first level waters and local government units for second level waters), as defined by two relevant documents to be developed at each governance level, namely the general and operational flood protection plans.

In July 2014, the Law on Post-Flood Rehabilitation in the Republic of Serbia and several other legislations were developed in order to fasten the reconstruction of areas, which have been affected by the floods and landslides of May 2014.

The Law on Meteorological and Hydrological Activity ("Official Gazette of the Republic of Serbia" No. 88/2010) regulates meteorological and hydrological activity, organization and performs meteorological and hydrological affairs of interest for the Republic of Serbia and other meteorological and hydrological operations, early warning system for meteorological and hydrological natural disasters, meteorological and hydrological data and information, protection of the hydrometeorological information system, international cooperation, as well as other issues of importance for meteorological and hydrological activity.

National and sectoral DRR related plans, policies and strategies

The following section describes national and sectoral DRR related plans, policies and strategies and the extent of DRR mainstreaming into these planning instruments.

The National Strategy for DRR Protection and Rescue in Emergency Situations has been adopted in 2011. The five priorities defined in the National Strategy for Disaster Management and Disaster Risk Reduction in Serbia are consistent with those of the Hyogo Framework for Action (HFA) 2005-2015:

1. Ensure that disaster risk reduction becomes a national and local priority with a strong institutional basis for implementation;
2. Identify, assess and monitor disaster risk and enhance early warning;
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
4. Reduce the underlying risk factors;
5. Strengthen disaster preparedness for disaster response at all levels.

The Strategy indicates that the agricultural sector is among the hardest hit sectors by disasters in an economic sense. It also calls for improved hydro-meteorological systems for early warning and alerts to reduce the impact on the sector.

²⁸ These two levels of watercourses as defined in the official government decree “Decision on establishing a list of water of 1st order”. The first level are the largest and priority watercourses, with the largest rivers and those that run through towns as some irrigation channels. All others are listed as level 2 water courses and supposed to be managed by the local self-governments. <http://www.ekourb.vojvodina.gov.rs/sites/default/files/Odluka%20o%20utvrdivanju%20popisa%20voda%20i%20reda.doc>

In December 2014, the National Disaster Risk Management Programme (NDRMP) was adopted with the objective to support the Government of Serbia to build a comprehensive programme for disaster resilience. However, the document only mentions floods, landslides and fire as hazards and there is no direct link made between natural hazards and climate change.

The NDRMP consists of the following components:

- Component 1: Institutional building;
- Component 2: Disaster risk identification and monitoring;
- Component 3: Structural and non-structural risk reduction;
- Component 4: Early warning systems and preparedness;
- Component 5: Risk financing strategies;
- Component 6: Resilient recovery.

Within these components, the DRR related measures mentioned included e.g. insurance (catastrophe and weather risk coverage), PDNA, awareness raising, early warning systems, strengthened preparedness activities, fire fighting training, land use planning, flood protection structures like dikes, river works, training to enhance the flood carrying capacity. In terms of flood prevention investments, flood overflow areas, temporary water retention areas and wet and dry reservoirs were provided as examples. However, indirectly it is multi-sectoral, but no specific sectoral measures were mentioned except the fire fighters training or any other reference to other relevant sectors. The focus was primarily on reducing the impact from floods, whereas drought impacts the agriculture sector more severely and substantially. It is therefore highly important that this is acknowledged and included in any DRR related as well as sectoral policies, strategies and plans, in order to give adequate governance direction for disaster risk reduction planning with a focus on the agriculture sector.

Following this programme, an action plan for the implementation of NDRMP (2016-2020) was developed and finally adopted in March 2017 by the Government of Serbia. This plan is aligned with the following relevant documents, the National Strategy for Protection and Rescue in Emergencies ("Official Gazette of the RS", number 86/2011), National Environmental Protection Programme ("Official Gazette of the RS", number 12/10), National Strategy for Sustainable Development ("Official Gazette of the RS", number 57/08), Action Plan for the Chapter 24 and the Programme for Meteorological and Hydrological Developmental Research related Activities for the period 2013-2017 ("Official Gazette of the RS", number 106/13) as well as with the Sendai Framework for Disaster Risk Reduction (2015-2030).

The action plan specifically underlines activities in the six sectors of agriculture, education, health, water management, social protection and cultural heritage. Specifically

for the agriculture sector, it includes activities such as risk assessments for the agriculture, water management, forestry, veterinary sectors that are consistent with international standards and EU Directives, developing vulnerability maps as well as flood and forest fire risk maps. In addition, early warning systems for forest fires as well as the improvement of institutional preparedness and response capacities at all levels are mentioned within the context of prevention, control and management of forest fires in Serbia. However, drought or activities related to drought were not included in this document. In this respect, the drought as a natural hazard is not highlighted sufficiently and underestimated, not only in this policy document, but also in otherwise as mentioned above. This could be due to the fact that data on the impact of droughts, including on the agriculture sector, are often lacking or not systematically and accurately collected and the importance of pre-disaster base line as well as post-disaster data collection should be enhanced and strengthened.

Strategy of agriculture and rural development of the Republic of Serbia 2014-2024

Natural hazards, such as drought, floods and storms are recognised as having an impact on agriculture. Climate change is viewed as an external threat and challenge to the sector as well as the possible spread of weeds to new areas. The strategy does not describe the connection between natural hazards and climate change. With regard to resources, food production, technological development and the environment, a lack of adequate responses to the effects of climate change is seen as well as a lack of systemic solutions.

This national sectoral strategy envisions the following:

*"The vision of development of agriculture and rural areas of Serbia reflects the projected situation in the sector we want to achieve in the following decade, and as such it involves: in 2024, the agriculture in Serbia should be a sector whose development is based on knowledge, modern technologies and standards, that offers innovative products to domestic and demanding foreign markets, and that enables the producers to have a stable and sustainable income; that enables the producers to have a stable and sustainable income; the natural resources, environment and cultural heritage of the rural areas are being managed in accordance with sustainable development principles, in order to make the rural areas attractive places for living and work for young people and other rural population."*²⁹

Among the key principles to achieve this vision is 'sustainable agriculture', which is viewed as one of the main principles for implementing this agricultural policy as agriculture is still one of the most important economic sectors in the rural areas. Disaster risk reduction is not included among the strategic goals, rather 'sustainable resources management environmental protection' and in particular the sustainable usage of available natural resources through e.g. responding to climate change, protecting the agricultural land, lowering greenhouse gas emissions, enhancing biodiversity and rural areas protection and so on.

²⁹ Ministry of Environment and Spatial Planning, 2011: 83

Priority area 6 'Adjustment to and alleviation of the climate change effects', includes several disaster risk reduction measures and activities were mentioned, such as insurance, raising awareness on climate change, practices and technologies regarding assortment, breeding and management as well as control of plant pests and diseases. Other measures mentioned under priority area 9 'Protection and improvement of environment and preservation of natural resources' aimed at encouraging sustainable agriculture practices (e.g. agri-ecological measure, agri-forestry, integrated natural resources management, integrated plants protection, land fertility, sustainable water management, organic agriculture), which were recognised as those that are required to be implemented in order to reform the agriculture sector. No other specific agricultural DRR measures, for instance related to drought, were mentioned as well as the lack of the inclusion of any gender or gender sensitivity or equality addressed in these measures.

Forestry Development Strategy for Republic of Serbia, 2006

Disaster risk reduction within the 2006 national forestry strategy only refers to forest degradation and within this context the need for sustainable forest management and protection for the environment and forest in order to conserve the biological diversity, increase productivity and regeneration potential for ecological, social and economic functions of the forest for the present and the future.

The goal of achieving sustainable forest management, through conservation and enhancement of forest state and promotion of forestry as an economic sector, will be supported by the government, under the principle of multi-functionality and the maintenance of ecological balance. It is viewed to be in line with the National Strategy of Sustainable Development as well as consistent with international frameworks and standards (e.g. United Nations Framework Convention on Climate Change (UNFCCC), Convention of Biological Diversity (CBD), Council Directive No. 2158/92 on EU forest protection against fire) with linkages to rural development. Afforestation is the only DRR activity mentioned and within the context of e.g. improving degraded soils, which is linked to reducing vulnerabilities to natural hazards.

Climate change is mentioned, but only with regard to climate change mitigation, such as the government's support to research and analysis regarding the potential of carbon sinks in forests and the efficient generation and consumption of bio-energy from sustainably managed forests.

In addition, institutional support and cross-sectoral coordination between the different actors and their roles and responsibilities are mentioned as well as the need to enhance international cooperation at the regional and global levels.

The National Sustainable Development Strategy of Serbia 2009-2017, adopted in 2008, harmonized with relevant international strategies and Millennium Development goals³⁰, as well as with the national strategies and regulation. It promotes integration of the principle of sustainability into all other sectors, thus devoting one of the chapters (10.2.7) to “Natural disasters – floods, landslides, fires, earthquakes”. Following the brief review of the main natural hazards and some of its recent consequences, first of all of floods and fire, there is short analysis given on capacities for prevention and response in the country. Among the main weaknesses, there is lack of organized civil protection system, early warning mechanisms as well as lack of awareness of need to use insurance against natural hazards as well as of established state system of insurance emphasized.

Action plan for the implementation of the national sustainable Development Strategy for period of 2009-2017

This strategic document outlines the various actions to implement the national sustainable development strategy and it thus outlines some DRR related measures. However, the relevant measures are those that help to reduce underlying risks and vulnerabilities, such as controlling the usage of fertilizers and pesticides to reduce impact on water, protecting against degradation and changes in usage of land, implementing erosion protection measures, promoting sustainable forest management and protecting natural areas and resources.

There is a specific section dedicated to climate change and various measures related to the implementation of a programme to enhance the hydro-meteorological information system, namely:

- “Automation of the meteorological and hydrological observation system;
- introduction of new technologies in the area of meteorological communications;
- improvement of the analytical-forecasting system as well as the early warning systems for atmospheric and hydrological disasters and climate extremes;
- establishment and maintenance of a climate data base, including data on projections of regional and local climate change.”³¹

Furthermore, climate change related measures are included, such as educational and public awareness raising programmes on the issue and effects of climate change, the establishment of greenhouse gas (GHG) inventories for agriculture and forestry, plans that contain emission reduction and climate change adaptation measures, improvement of manure and organic waste management, more efficient use of nitrogen fertilizers, promotion of organic farming, and research and development promotion on new crop varieties and livestock breeding.

³⁰ Millennium Development Goals expired in 2015 and were replaced by Sustainable Development Goals by 2030

³¹ Republic of Serbia, 2009: 159

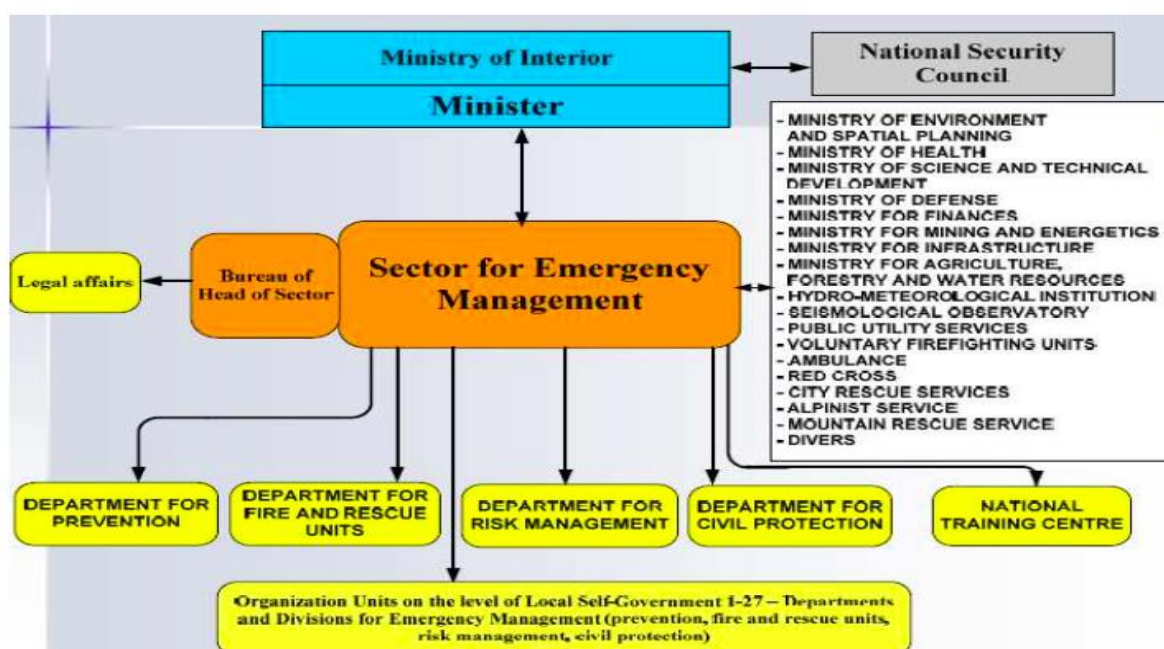
The biodiversity strategy of the Republic of Serbia for the period of 2011-2018

The extent of DRR mainstreaming in the biodiversity strategy is limited. Examples of natural hazards are hardly present, except for fire and pests outbreaks as a result of the expected rising temperatures due to climate change, which is extensively included and linked to agro-biodiversity and ecosystem diversity. The strategy recognises this interconnectedness between climate change and biodiversity as the latter is affected by climate change as well as it substantially contributes to both mitigation and adaptation through the ecosystem services its supports. Furthermore, the role of agro-biodiversity in enhancing agricultural production and reducing pressure on vulnerable ecosystems, forests and endangered species is also described. In terms of measures mentioned are those non-sectoral ones, including awareness raising and national campaigns, monitoring of long-term climate change impacts on biodiversity, evaluations and refinements of adaptation strategies and actions, climate change vulnerability analyses of terrestrial and freshwater ecological systems.

Main stakeholders, roles and responsibilities for DRR/M at all levels

The Ministry of Interior leads the National Emergency Management Headquarters, which is in charge of the protection and rescue management activities as well as the mainstreaming of DRR policy in the country. The **Sector for Emergency Management (SEM)** is directly under the Minister of Interior and its five directorates are responsible for civil protection, prevention, risk management, fire and rescue, as well as the National Training Center (NTC) as shown in Figure 5 below.

Figure 5: Structure of the Sector for Emergency Management



Source: WMO, 2012

In line with the Law on Emergencies, the SEM is in charge of the coordination of the activities of all relevant government institutions with regard to emergency and disaster management.

The SEM is involved in the following four strategic areas:

- The development of emergency plans, where the SEM has a coordination role with regard to the establishment of mechanisms for emergency management;
- The adoption of a National Strategy for Disaster Risk Reduction, which focuses on reducing risks and vulnerability within the context of sustainable development;
- The implementation of the European emergency call number 112, which also includes the setting up of an operational information center that has the capacity to store, manage and analyse data regarding hazards and risks. This information center is also in charge of flood risk assessments;
- The enhancement of international cooperation.

The core responsibility for flood protection and water management at the national level resides with the **Ministry of Agriculture and Environmental Protection**, namely its **Water Directorate (WD)**, regarding the level 1 priority watercourses. The WD looks after the flood protection infrastructures as well as flood protection planning. It also focuses on hydrological drought management and provides advice on the accumulation and flows regimes if water levels are low. Furthermore, it coordinates international water management programmes and projects, thereby ensuring that there is coherence in the flood risk assessment and mapping methodologies, although the Directorate is not itself involved in these activities as it plays a more managerial role.

Flood defence in watersheds is organized and implemented by public water management companies (**Srbijavode PVMC, Vode Vojvodine PVMC and Beogradvode**) on the territories. These companies are directed by the Ministry of Public Administration and Local Self-Government. The **Republic Hydro meteorological Service (RHMSS)** is entrusted to continuously monitor the meteorological and hydrological situation and publish meteorological and hydrological forecasts, announcements and warnings before and during floods in order to mitigate the impacts.

Water and flood management of level 2 watercourses are within the mandate of local governments. Which are tasked to e.g. prepare flood risk plans, conduct flood risk assessments, implement flood protection plans/measures, as well as is responsible for the operational activities related to emergency situations, overall management, coordination and evaluation of contingency infrastructural works (e.g. cleaning riverbeds, construction and maintenance of river walls, water gates), as well as managing the technical, human and financial resources.

The role and responsibilities of the **local self-government unit** is defined in the Law on Local Self Government as mentioned earlier. With regard to disaster risk reduction and management, the local self government unit shall:

- 1) Pass a decision on organizing and functioning of civil protection in the territory of the local government unit and ensure implementation thereof in accordance with the integrated protection and rescue system of the Republic of Serbia;
- 2) Adopt a plan and programme of development of the system of protection on the territory of the local government unit in accordance with the Long Term Plan of development of the protection and rescue system of the Republic of Serbia;
- 3) Plan and identify sources of funding for development, setting up and execution of tasks related to protection and rescue and development of civil protection and implementation of measures and tasks of civil protection on the local government unit;
- 4) Set up an emergency management headquarters;
- 5) Cooperate directly with the competent body, other state agencies, companies and other legal persons;
- 6) Cooperate with regions and municipalities of neighbouring countries, in accordance with this Law and other laws;
- 7) Align its own plans of protection and rescue with the Plan of Protection and Rescue in Emergency Situations of the Republic of Serbia;
- 8) Identify trained legal persons of special interest for protection and rescue;
- 9) Ensure telecommunication and information support for protection and rescue and ensure inclusion into the telecommunication and information system of the Department for Observation, Information and Alert and liaise with it;
- 10) Develop and adopt the Vulnerability Assessment and the Plan of Protection and Rescue in Emergency Situations;
- 11) Monitor for threats, informing and early warning the population;
- 12) Procure and maintain alarm instruments within an integrated system of public alert in the Republic of Serbia and participate in the development of the study of coverage by the public alert system for the territory of the local government unit;
- 13) Organize, develop and implement personal and mutual protection;
- 14) Set up, organize and equip general purpose civil protection units;
- 15) Adjust plans of protection and rescue in emergency situations with neighbouring local governments.

The competent body of the local government unit, in cooperation with the competent authorities, competent bodies of the autonomous province, municipal and metropolitan emergency management headquarters and other professional bodies of the local government unit shall develop the assessment of risk of the local government unit and propose to the competent body of the local government unit its adoption.

The role and responsibilities of Public administration bodies³² with regard to risk reduction and emergency management, include that the public administration bodies shall:

- 1) Ensure that sectoral policies are consistently aligned with the disaster risk reduction policy;
- 2) Provide timely notifications to the Directorate (which does not yet exist, but it is envisaged in the draft law on DRR/M that has not been adopted yet) about detected occurrences and problems relevant to risk reduction and data relevant to the assessment of existing risks, and also about the occurrence of new risks and threats;
- 3) Plan, organize and ensure performance of their activities in emergencies;
- 4) As soon as the drafted law on DRR/M has been adopted and replaces the current one, it is envisioned that the role of public administration bodies will include the participation in the drafting of the DRR Strategy, Risk Assessment, National Risk Reduction Plan, Protection and Rescue Plan of the Republic of Serbia and other plans and programme-related documents;
- 5) Propose to the Directorate the companies and other legal persons within their competence, which are of special importance for protection and rescue of the Republic of Serbia;
- 6) Perform other activities stipulated by the Law.

The role and responsibilities of the Directorate of Risk Management and Emergency Situations are laid down by the draft Law on DRR and other relevant Laws, within this context the Department shall:

- 1) Prepare the DRR Strategy;
- 2) Prepare and propose the Action Plan for the implementation of the Strategy;
- 3) Conduct risk assessment of the Republic of Serbia, develop the risk reduction plan of the Republic of Serbia and the Protection and Rescue Plan of the Republic of Serbia;
- 4) Manage and coordinate the work of all organisations within the system and parties;
- 5) Organize and maintains the Risk Register of the Republic of Serbia;
- 6) Identify high and immediate risk zones of natural and other (man-made) hazards;
- 7) Approve risk assessments, risk reduction plans and protection and rescue plans;
- 8) Perform expert, technical and administrative work for the National Emergency Management Headquarters;
- 9) Undertake measures in order to organize and provide telecommunication and information systems for management and coordination purposes as well as data and information transfer and protection during emergencies;

³² These bodies are defined by the Law on Public Administration and include, among others, ministries, and special organizations, such as the Public Investment Management Office, cabinet offices (like the Prime Minister's) and Serbian districts and so on.

- 10) Consolidate and keep a single database on human, material and technical resources of the organizations within the system;
- 11) Educate, train, equip, mobilize and engage specialized civil protection units for the territory of the Republic of Serbia;
- 12) Set up National and Regional Training Centres for the organizations within the;
- 13) Initiate and finance scientific research in the area of disaster risk reduction;
- 14) Order partial mobilization of the required human and material resources;
- 15) Directly cooperate and exchange information as well as data with the services of the same scope of activity in other countries, and also with international organisations;
- 16) Perform other activities as laid down by the Law.

The Office for the Assistance to and Recovery of Flooded Areas has been established in May 2014, to coordinate and report on aid provided to affected areas due to the 2014 floods and landslides in Serbia. In the meantime, in November 2015 the Office for the Assistance to and Recovery of Flooded Areas is transformed into **Public Investment Management Office (PIMO)**. The PIMO is in charge of coordination and prioritisation of recovery activities in Serbia, related to public infrastructure and other assets, including agriculture related assets. The PIMO is also in charge to verify the post-disaster needs assessment (PDNA), including the damage and loss assessments of the May 2014 floods.

The Ministry of Agriculture, Forestry and Water Management

The Ministry of Agriculture, Forestry and Water Management has following seven departments:

1. Department for plant protection
2. Veterinary department
3. Forestry department
4. Directorate of Agricultural Inspection
5. Directorate for Agrarian Payments
6. Republic Water Directorate
7. Department for Agricultural Land
8. Directorate for National reference laboratories

The Indemnity Fund, an implementation agency of the Ministry of Agriculture, is primarily involved with insurance and compensation as a result of losses in goods stored in certified public warehouses. Its roles and responsibilities are further on described in the section on agriculture insurance.

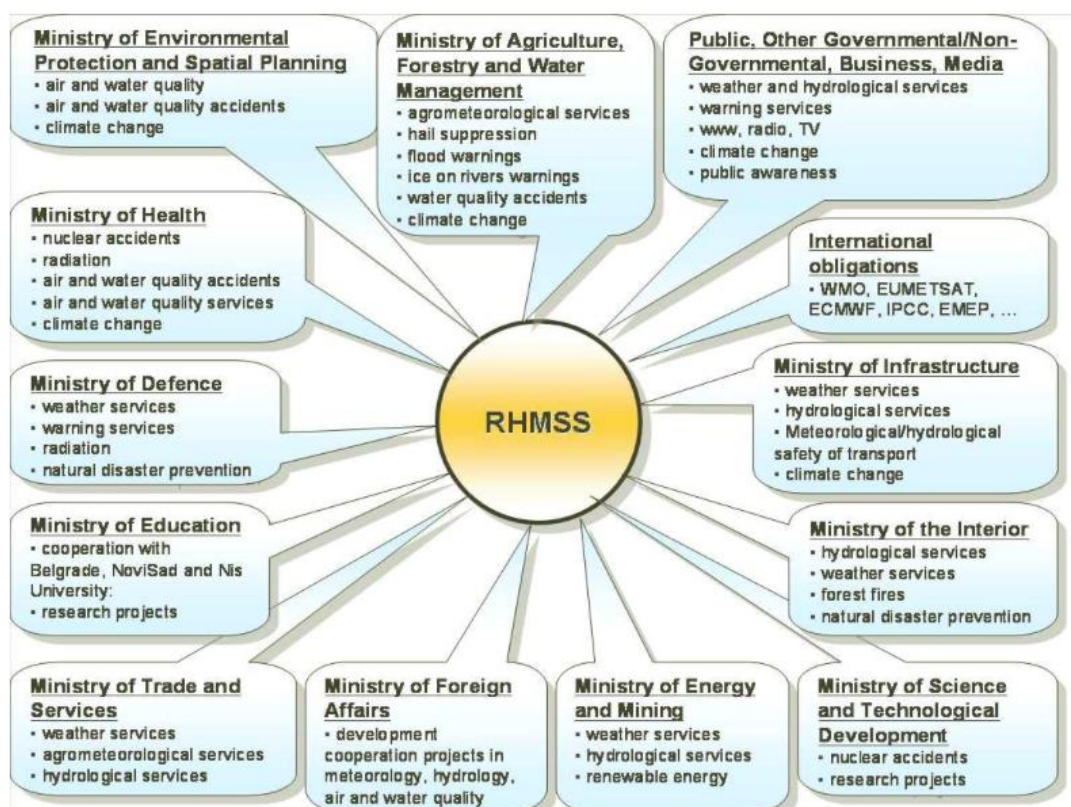
When it comes to DRR many of these departments have some specific services that contributes to DRR, but are not called or perceived that way. An “umbrella” approach is missing. For example, veterinary department monitors animal diseases, organize vaccination, quarantine, etc. Department for Agricultural Land is in charge (among other) for protection, management and use of agricultural land, Water Department is in charge

for water management. Forestry for forest management, which include reforestation, control of forest fires risks and so on.

The **Republic Hydrometeorological Services of Serbia (RHMSS)** is involved in the monitoring, detecting, forecasting of weather, climate and water, as well as issuing of early warnings of extreme hydro-meteorological events. It also carries out international obligations in the area of meteorology and hydrology as well as other activities as defined by various laws, including the Law on Ministries ("Official Gazette of RS", No. 65/08, 36/09 and 73/10), the Law on Meteorological and Hydrological Activities ("Official Gazette of RS", No. 88/2010), the Law on Waters ("Official Gazette of RS", No. 30/2010), the Law on emergencies ("Official Gazette of RS", No. 111/2009), the Law on Air Navigation ("Official Gazette of RS", No. 73/2010), the laws on the ratification of international conventions regarding e.g. meteorology, hydrology, climate change and environment and other bilateral and multilateral regional agreements.

Regarding early warning, RHMSS is in charge of the establishment and functioning of the integrated meteorological and hydrological multi-hazard early warning systems as part of the National Protection and Rescue system, which is coordinated by the SEM. Within this context, the RHMSS is responsible for the dissemination of timely and reliable information to protect lives, goods and services. Figure 6 outlines the various DRR linkages that the organization has with other institutions.

Figure 6 Overview of operational linkages of RHMSS with other institutions regarding DRR



Source: WMO, 2012

RHMSS is also involved in the development of the National Protection and Rescue Strategy as well as the Director of the RHMSS is a Member of the National Security Council and the Republic Emergency Headquarters so, which is not mentioned in the above figure, but due to this position RHMSS will be involved from the onset of a disaster.

Early warning systems

The RHMSS issues early warnings of extreme meteorological and hydrological events, such as strong winds, hail storms, thunderstorm or lightning, flash floods, river flooding, occurrence of ice on rivers, heavy snow, heat waves, cold waves and drought. In 2008, an early warning and alarm system for atmospheric and hydrological hazards was established, which is called 'MeteoAlarm'³³ and 'HydroAlarm'³⁴. The European Meteoalarm³⁵ includes the Serbian Meteoalarm system, and provides alerts for the occurrence of severe weather, such as heavy rain with risk of flooding, severe thunderstorms, forest fires, fog, snow etc.

Serbia is also a member of the European Flood Alert System (EFAS), which was established in 2003 by the European Commission (EC). The EFAS has the objective the enhance warning time for floods in transboundary river basins in Europe, which will help to complement flood preparedness activities of Member States as well as increase information of the EC to enhance aid and crisis management. For instance, since 2005, it disseminates early flood warning information up to 10 days in advance to national water authorities and the EC.

As mentioned above, the early warning system consists of the meteorological and the hydrological early warning system. The meteorological warnings are based on RHMSS Numerical Weather Predictions (NWP) modelling, observations and satellite data as well as on up to 10 days of weather forecasts established by the European Centre for Medium-Range Weather Forecasts (ECMWF) and other international agencies. The hydrological early warnings are based on NWP modelling of precipitation as a result of hydrological and propagational models. The warnings for floods are consisted of two parts:

- Firstly, a warning is issued when the water in the river is expected to reach an established/defined threshold for regular flood defense;
- Secondly, a warning is disseminated as soon as is expected the water level will reach an established threshold for the emergency flood defense, that is one meter below the embarkment crown.

Table 1 below provides an overview of the existing warnings of the different types of natural hazards and whether these alerts are issued by the RHMSS.

³³ See http://www.meteoalarm.rs/eng/meteo_alarm.php

³⁴ See http://www.meteoalarm.rs/eng/hidro_alarm.php

³⁵ See http://www.meteoalarm.eu/?lang=en_UK

Table 1: Warnings for natural hazards in Serbia

Hazard	Exists in the country	Warning by
Flash floods	Yes	RHMSS
River flooding	Yes	RHMSS
River ice	Yes	RHMSS
Coastal flooding	No	
Hailstorm	Yes	RHMSS
Thunderstorm or lightning	Yes	RHMSS
Heavy snow	Yes	RHMSS
Dense fog	Yes	RHMSS
Tornado or cyclone	No	
Strong wind	Yes	RHMSS
Storm surge	No	
Heat wave	Yes	RHMSS
Cold wave	Yes	RHMSS
Drought	Yes	RHMSS
Landslide or mudslide	Yes	
Avalanche	No	
Forest or wildland fire (and conditions for fire occurrence)	Yes	RHMSS
Earthquakes	Yes	
Volcanic events	Yes	
Dispersion of insect pests	Yes	

Source: WMO, 2012

The dissemination of the warnings related to the weather, climate and water regime, are conducted by RHMSS in collaboration with various media outlets, including through e.g. TV and radio stations, phone (SMS), email, internet to the public to the following institutions according to the alert type.

Meteorological warnings are disseminated to:

- Ministry of Interior (Sector for Emergency Management);
- Emergency services (Center for informing and alerting of the City of Belgrade);
- Serbian Government;
- Media (TV and radio stations);
- Local authority and public utilities;
- Other departments of RHMSS, such as hail suppression, hydrological, agro-meteorological, air and water quality control.

Hydrological warnings are dissinated to:

- Ministry of Interior (Sector for Emergency Management);
- Ministry of Agriculture, Forestry and Water Resources Management;
- Ministry of Environmental Protection;

- Water management public enterprises “Srbijavode”, “Vode Vojvodine” i “Beogradvode” (national, province of Vojvodina, and City of Belgrade enterprises);
- Public Enterprise ‘Electric power industry of Serbia’;
- Republic information centre;
- Belgrade information centre;
- Media (TV and Radio stations).

When alerts are disseminated through TV and radio stations, they do not cut programme or add a banner of the warning during a programme as RHMSS do not have a mandate for this. Its National METEOALARM system established in 2009, which is consistent with the EUMETNET METEOALARM system. As Hydromet is a member of the European Flood Alert System (EFAS) since 2007, it also receives flood warnings from EFAS.

With regard to agriculture in particular, RHMSS has a specific agrometeorology section³⁶, where it publishes 7, 10-day, monthly and annual bulletins with current meteo conditions, forecasts, warnings about pests and diseases as well as agro production analyses of past years. It provides the CROP-SYST agrometeo model for maize yield forecast in six locations in Serbia as well as general meteo³⁷ and hydro alarm information³⁸. There is a forecast and reporting service³⁹, which is part of the Agriculture Extension Service that monitors e.g. weather data, pests and so on. However, this service is not well known to farmers and therefore awareness of this and communication with farmers should be improved in order to help them make more informed decisions, based on a wide range of relevant information.

Post-disaster needs assessment

An important legal document that relates to post-disaster damage and loss assessment is the **“Law on Reconstruction Following Natural and Other Hazards.”** This Law regulates the procedure of reconstruction and aid allocation to the citizens and business entities, who have incurred damages and losses as a result of natural and other hazards.

Natural and other hazards are defined by this law as events caused by the impact of natural forces or human activity, which have disrupted lives and livelihoods to the extent that exceeds the regular capability of individuals and the local community to recover without assistance from the state. When the damage exceeds 10 percent of the budget of a local self-government unit, an event is declared as a disaster by the Government. In some cases, the Government may declare a natural or another hazard and decide to allocate state aid even though the caused damage may be less than 10 percent.

³⁶ <http://www.hidmet.gov.rs/latin/meteorologija/agrometeorologija.php>

³⁷ http://www.meteoalarm.rs/ciril/meteo_alarm.php

³⁸ http://www.meteoalarm.rs/ciril/hidro_alarm.php

³⁹ <http://www.pisvojvodina.com/default.aspx>

Damage reporting

Without delay and no later than within 15 days following the declaration of a natural and other hazard, a local self-government unit invites the citizens to report the damage sustained within the period of minimum 15 to maximum 60 days following the invitation announcement. Sometimes, if a citizen is not able to report the damage within 60 days, he or she is allowed to do it no later than 6 months following the invitation announcement and after which the procedure for aid allocation shall commence following the damage reporting. The procedure to establish aid eligibility is managed in line with the provisions of the General Administrative Procedure Law, unless otherwise stipulated by this Law.

Damage assessment

A local self-government unit shall establish, without delay, the required number of committees to assess the damage caused to citizens' assets following a natural and other hazard, in line with the **act on a single methodology for assessing damage from a natural and other hazard**, passed by the Government. A local self-government unit shall ensure uniform and coordinated implementation of the act on a single methodology for assessing damage from a natural and other hazard.

Methodology

Local self-governments will conduct the damage assessment based on the instructions from the Government. At the moment, the **Guidelines on unique methodology for damage assessment** adopted in 1987 are still valid. This methodology has been developed to serve as a tool to determine damages caused by different factors, especially floods and earthquakes, but also fires, droughts, storms, hail, landslides, diseases, etc. The methodology recognizes direct damages, costs caused by the disastrous event and losses. The guidelines include forms and templates for different types of sectors, such as for construction, equipment, agriculture, etc. and also consists of instructions on how to use these templates.

As the guidelines are adopted in 1987 and apply to the structure of the Socialist Federal Republic of Yugoslavia, this has been causing a lot of confusing and is often subject to different interpretations. In general, the methodology is outdated, requires to be updated and adjusted to international standards and guidelines. This is one of the activities proposed under the Draft Action Plan for the implementation of DRRMP. In addition, most of the local governments are not trained on how to use this methodology.

The Ministry for Local Self-Government and later the Office for Flood Relief was to develop updated instructions and this may have been sent to the local governments after May 2014, but it is not officially updated and most likely requires further strengthening. The experiences from the May 2014 floods showed very different understanding of methodology and extensive differences in damage reporting among municipalities. More recently, in March 2016, new floods have occurred and affected Serbia and the Government declared an emergency situation in 15 self-governments.

Within this context, the local governments are instructed to create **Damage Assessment Committees**. However, in several municipalities, it appeared that members of these committees were not aware of the existing methodology to be used for reporting or damage assessment as they are using their own templates, application forms, or damage assessments. In some municipalities, representatives of Public Investment Management Office (PIMO) will be sent to support the work of the local committees. The role of Ministry of Agriculture (or any individual Ministry) is not clearly defined in the new Law, although a number of activities and actions that MAEP is in charge of are outlined in the Action Plan for the Implementation of DRRMP. However, in general the DRRM capacities within MAEP should be strengthened.

Damage assessment verification

The Office for Rehabilitation of Flood Affected Regions, a government body, shall verify damage assessments conducted by the committees set up by the local self-government unit. Verification shall represent an expert procedure including confirmation of the validity and accuracy of a damage assessment conducted, on the basis of the act on a single methodology for natural and other hazard damage assessment, conducted by the committees set up by the local self-government unit. The director of the Office shall organize the procedure of damage assessment verification and determine its scope. Should any irregularity occur during the verification procedure, the Office shall notify the local self-government unit and provide instructions to rectify the situation. In case of large-scale inaccuracies, the Office shall take over the organisation of damage assessment at the expense of the local self-government unit.

Local self-governments are in charge to determine damages and losses caused by the natural disasters and other accidents and to submit their report to the national government within 60 days after the disaster. The post-disaster damage assessment should be undertaken by a committee that will be created for this purpose, for the level on which the damage occurred (local, republic, etc.).

The national government of Serbia will support recovery and rehabilitation in cases where damages are higher than 10 percent of the national income in the local self-government recorded in the year prior to disaster, through a separate fund.

Experience from May 2014 floods have shown that the focus of post-disaster damage assessment of local committees was on infrastructure (houses, public building, roads, etc.), while agriculture was very often neglected. The main reason, as reported by the local governments, was that no assistance was expected for agriculture, so they did not collect the data.

Assessment of the disaster impacts

The macroeconomic impacts of the disaster at national and provincial level are not estimated on the basis of the established disaster effects. The impact of the disasters on

the socio-economic status and human development, which includes the impact on poverty (particularly rural poverty); impact of the disaster on household and personal incomes and loss of employment and incomes; impact on debts and access to finance and impact on food security is not estimated or taken in account during the compensation. The conducted assessments or the follow up procedures do not indicate any cross-cutting issues to be addressed in the recovery process, such as gender & social equity and disaster risk reduction.

Recovery strategies and reconstruction needs

A specific recovery strategy is not produced for each disaster at the local, regional or national level. Rather a government decision for the allocation of funds, which is also prepared for the recovery actions by PIMO and circulated for feedback and comments among the relevant institutions, including the MAEP. As such any support provided to the affected population is based on the available funds, which are distributed in accordance to ad hoc developed modalities. Therefore, follow-up recovery activities are mainly focused on the restoration of damages to major infrastructures. Part of the shift towards a proactive DRR approach, is the integration of DRR in recovery activities, so-called 'building back better', including in the agriculture sector.

Hazard, risk and vulnerability assessments and mapping

The Law on DRRM that has been recently drafted outlines the legal framework, which also describes the duties of the Government, provincial and local self-governments to develop and regularly update single or multi-risk assessment plans. In addition, article 14 of the draft law, defines that risk assessments should identify the type, property and origin of certain risks of natural and other hazards, vulnerability level, causal factors or factors increasing the level of hazard probability, as well as the possible consequences for lives and health of people, environment, material and other goods, public service or business activity and other elements of the usual living, economic and social activities. It further states that risk assessments should be prepared at all levels, including the national, autonomous provincial and local self-government level and should be based on the single methodology set forth by the Director of the Directorate for Risk and Emergency Management. The risk assessments should be updated on a regular basis and at least once a year.

Different institutions are involved in risk assessments. For instance, the Sector for Emergency Situations (SEM) developed and adopted a risk assessment methodology in 2012, which is now being updated (2017). Although, only a few municipalities have used it to develop comprehensive risk assessments. As a result, the risk reduction aspects are not fully applied either, for example, with regard to assessing drought risks as SEM as well as other organizations do not have the mandate to conduct these assessments.as there

does not exist any specific legal or institutional framework. The SEM views drought only as a condition for wild fires.

The RHMS seems to work only on meteorological risk mapping, including meteorological drought. Serbia also participates in the Drought Management Centre for Southeastern Europe (DMCSEE) project, which aims to coordinate and facilitate the development, assessment, and application of drought risk management tools and policies in South-Eastern Europe with the goal of improving drought preparedness and reducing drought impacts. The RHMS seems to work only on meteorological risk mapping, including meteorological drought. Within this DMCSEE project it regularly calculates the Standard Precipitation Index (SPI), but no information on whether soil moisture or water retention capacity of crops is calculated as well.

With regard to floods, the Water Directorate (WD), of the Ministry of Agriculture and Environmental Protection, is in charge of flood analysis, including conducting risk assessments, which consists of the following steps:

- Undertaking preliminary flood risk assessments for each river basin;
- Conduct flood mapping, including the development of flood hazard maps and flood risk maps;
- Develop annual operational flood risk management plans, with the most recent one prepared for 2017.⁴⁰

In addition, the WD is also tasked to manage the flood protection infrastructures and undertakes flood protection planning, such as preparing the annual as well as the five-year flood protection and management plans, which describe the flood protection and management roles and responsibilities of the various stakeholders.

Other agencies that are involved in conducting assessments include the RHMS. As mentioned in the Law on emergencies and Law on meteorological and hydrological activities, the RHMS is also in charge of undertaking vulnerability assessments and conducting risk maps for meteorological hazards, which it then disseminates to the Ministry of Interior as it coordinates the preparation of protection and rescue plans. In addition, it also collaborates with other institutions regarding hazard mapping, provision of historical data for risk assessments, development of hydrometeorological maps. Although the level of cooperation is quite low due to the lack of understanding or recognition for the need of cooperation in these areas. RHMS aims to receive regular feedback on its website from its stakeholders as well as it occasionally provides training to its stakeholders to enhance understanding of hazards and analysis of warnings. In general though, there is no integrated multi-hazard risk assessment conducted in Serbia, only for single hazards, like floods. Vulnerability and exposure to various natural hazards are not clearly defined nor yet mapped.

⁴⁰ <http://www.rdvode.gov.rs/lat/podzakonska-akta.php>
<http://www.rdvode.gov.rs/doc/dokumenta/podzak/operativni%20plan%202017.pdf>

In terms of plans and databases, the new Law also proposes the establishment of **disaster risk reduction plans** on all levels. An increase has been observed in number of these plans that have been developed for the municipalities, usually through the engagement of private companies or individuals that are licensed by the SEM. The research that FAO conducted in Serbia in January 2017 was in a sample of 23 municipalities, which showed that in 14 percent of the municipalities DRA plans have not yet been adopted, while in 45 percent of the municipalities these plans are currently under development, in 27 percent of the municipalities the DRA plans have been developed, but not yet adopted and in 14 percent of the municipalities these plans have been developed and adopted. About 86 percent of the municipalities used the official risk assessment methodology developed by SEM. However, only 5 percent of the plans were approved by the SEM, which provides some indication regarding the level of quality and gives some insight in that the municipalities most likely tend to view and approach this task only to fulfill the requirement set by the national government. In addition, only 25 percent of plans have assessed and included the risks on agriculture production.

The new law also promotes the creation of a **risk registry**. As proposed by the draft Law, the risk registry is to be formed within 3 years after the adoption of the Law. No clear description of the registry exists, but it should serve as a database of registered risks from natural and other disasters in the country. It would also include data and information for drought risk assessments and drought vulnerability assessments.

Contingency planning in agriculture

The Law on Commodity Reserves mentions that commodity reserves can be used in case of natural disasters, which may have adverse impacts on the country's food supply. In addition, from time to time, the Ministry of Agriculture's Directorate for Agrarian Payments has available grants to construct grain silos as reserves to be used during emergency situations. The government also intervenes through purchasing certain food products during good harvests when there is an oversupply of food. However, no other specific contingency planning and plans or preparedness activities for the agriculture sector seem to be undertaken and take place.

The Indemnity Fund was established in 2009 through the Law on Public Warehouses for Agricultural Products. It is tasked to ensure the quality and quantity of stored goods through a warehouse receipt system. Farmers can store their goods at warehouses if they pay and obtain an annual membership fee. If these goods become damaged during the period that they are stored, the members can withdraw their goods from the facility for the quality and quantity mentioned on the warehouse receipt. As a result, the Indemnity Fund will compensate the farmer from the annual membership fund for their stored goods.⁴¹

⁴¹ <http://www.kompenzacionifond.gov.rs/index.php?page=29-about-us>

Agricultural insurance

Insurance is an important risk transfer tool for farmers, however, insurance in agriculture in Serbia is still quite underdeveloped. Insurance of crops and animals is primarily used by commercial agricultural producers and companies as the majority of the small scale farmers are not insured. In addition, the insurance companies state that the larger agricultural companies use insurance every year, however, it is not always for the same risks. The exact number of insured people and companies are not known, however, it is estimated to be only several percent of the almost 2 million people whose livelihoods depend on agriculture and the 450 000 registered agricultural units. It is calculated that only 5 to 10 percent of small scale farms have insurance for crops and animals.⁴² It is calculated that the agricultural insurance premium (approximately RSD 2.04 billion) constitutes only less than 3 percent of the total insurance market, of which about 40 percent of the premium (around RSD 450 million in 2016) is subsidised by the Serbian government.⁴³

Four types of agriculture insurance: crop insurance

There are different types of agriculture insurance in Serbia, including crop insurance, animal insurance and crop insurance against drought and excessive rainfall. Crop insurance premiums made up about 2 percent of the total non-life insurance in Serbia in 2011.⁴⁴ The crops that are covered by this type of insurance include stubble, sub-crops, cover crops, perennial crops, ornamental plants; fruit, vine and forest seedlings; vegetable seedlings and other crops; young forest crops to six years of age; plaiting willow, reed, poplar and so on.

The basic risks, which are covered by the insurance, includes hail, fire and lightning, with storms, floods, spring and autumn frost as additional risks. These latter risks are covered by the insurance if a supplementary insurance is agreed and an additional premium is paid on top of the basic premium. Crops of individual farmers can be covered against these additional risks if a so-called collective insurance is concluded. In this regard, 'collective' refers to an insurance that covers at least 50 percent of the area with a particular crop or a minimum of 30 households cultivating a particular crop in the area.⁴⁵

As the level of crop insurance is still quite low in Serbia, in order to promote these insurance products, discounts are provided e.g. if agricultural crops are insured by groups in the private sector as well as for long-term insurance, an additional insurance for other crops in the same area and so on.

Animal insurance

It is estimated that in 2011 animal insurance was merely 0.56 percent of the total

⁴²Počuča *et al.*, 2013

⁴³ <http://www.ekapija.com/website/en/page/1478293>

⁴⁴ Počuča *et al.*, 2013

⁴⁵ Počuča *et al.*, 2013

insurance market, which is substantially lower than the share of livestock to Serbia's GDP and far from the actual needs for this type of insurance. Healthy domestic animals can be insured, including cows, bulls, sheep, goats and pigs, while diseased or sick animals and those that are exhausted, stunted, blind and in poor conditions etc. cannot be insured.

Regarding the determination of the amount of insurance, animals are insured to an amount that is mutually agreed by insurer and insured. The actual value of the animal is considered to be the product of its weight and market price on the date that the contract is concluded or on the day when the damages are estimated. While those animals that are in groups with an equal value, can be insured against an average insurance amount. Generally, the premium rate, allowances and discounts are agreed for period of one year, although, sometimes insurance can also be closed for a certain period of the year.

Crop insurance against drought

Drought can adversely affect agricultural production, which occurred in Serbia as crops and fruits were significantly impacted by several droughts during the last decade. It is estimated that drought is one of the largest agricultural risks that can reduce yields by over 50 percent. Within this context, certain insurance companies have established insurance products that cover drought risks.

A drought is defined, within the context of insurance, "as a reduction of yield based on rainfall reduction in the reference time period in relation to the long-term average. Thus, the insured risk is a drought, which includes the reduction of authoritative rainfall compared to authoritative long-term rainfall average. Amounts of authoritative precipitation and authoritative long-term average depend on the type of insurance subject that can be insured."⁴⁶

There are specific crops that can be insured against drought, namely mercantile and seed corn, mercantile and seed soy and mercantile sugar beets. For corn and sugar beets, the water need is the greatest during the months of May to August, while for soy this is during June to August. There are certain types of crops that can not be insured, such as those crops that are cultivated on non-identified land and those produced on areas that are according to drought risk zones not located within administrative municipalities.

In addition, the crop is not insured if damage or reductions in yields are the result of "any other reason other than the insured event; the effects of disease, pests or poor germination; non-compliance of production technology, i.e. application of optimal agro-technical measures for a given area and a given culture (seeding dates, seeding depth, dressing, etc.) or their improper implementation; the effect of high temperatures, uneven distribution of rainfall during the growing season, lack of deep moisture, inadequate humidity and any atmospheric and other influence that is not a drought risk."⁴⁷ However,

⁴⁶ Počuča *et al.*, 2013: 172.

⁴⁷ Ibid.

the last few reasons mentioned means that the insurance company have ensured that they will not provide any compensation from damage and losses that occur as a result of drought conditions.

Crop insurance against excessive rainfall

With climate change it is expected that extreme weather events will increase in frequency and severity. Even though that overall precipitation may decrease, the number of excessive rainfall events may increase in the future due to climate change and within this context, farmers would benefit from insurance against excessive rainfall. Crops that are insured against this type of natural hazard that can cause significant damage, include wheat, barley, oats, rye, canola, soy, corn, sugar beet and sunflower. The months of May and June are the highest at risk of water logging on land, due to excessive precipitation in a short period of time, which can totally destroy crops.

Insurance subsidies in agriculture

The insurance against natural hazards, such as hail, floods, droughts or pests and diseases are sometimes supported via subsidies, which vary from 15 to 75 percent of the insurance premium. This is facilitated through the Ministry of Agriculture and Environmental Protection (previously the Ministry of Agriculture, Trade, Forestry and Water Management) for crop and animal insurance. In 2012, the government of Serbia adopted a specific regulation for conditions and the use of reimbursement funds for the insurance of animals, crops, fruits, nursery gardens and young perennial plants. In order to have the right to be able to use these funds, the individual or farm owner should have been 1) registered in the Register of Agricultural Holdings; and, 2) have an active status.

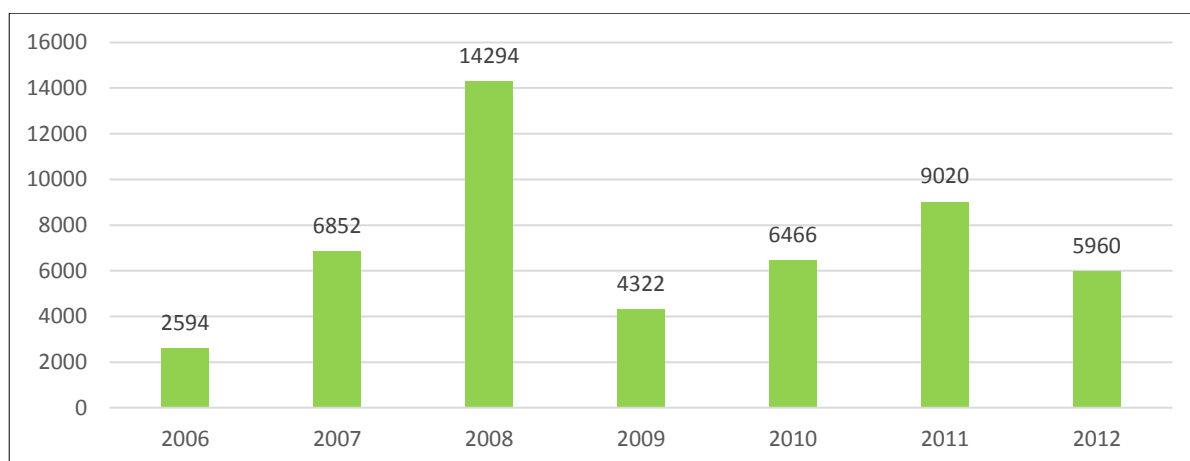
40 percent of the insurance premium net without tax included for non-life insurance premium can be claimed if the farmer has insurance that will cover:

- “animals against the risk prescribed by the conditions of insurance companies;
- crops and fruits against the risk of yield reduction;
- nursery gardens and young perennial plants before entering into race, against the risks prescribed by the insurance companies.”⁴⁸

Although the provision of subsidies for insurance has been provided earlier than 2012. Actually specific awareness was raised by the government among farmers from 2006 onwards. However, the number of applications varies substantially between the period of 2006-2012 as shown in figure 7 where the highest number of applications filed is in 2008, whereas the highest amount of funds granted for subsidies is in 2011 as displayed in figure 8.

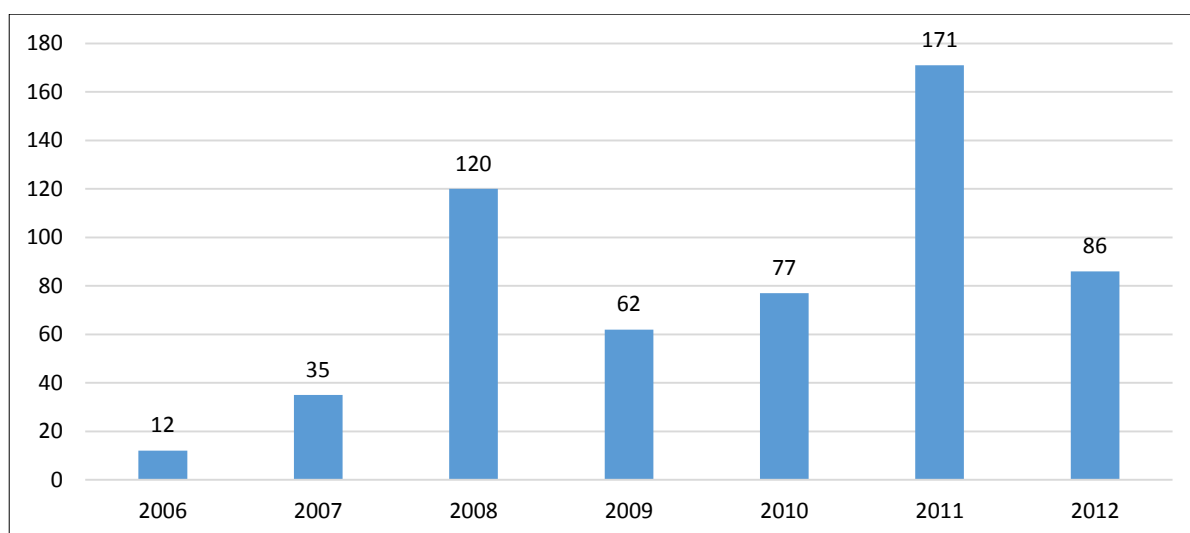
Figure 7: An overview of the applications filed for agricultural insurance premium subsidies

⁴⁸ Počuča *et al.*, 2013: 174.



Source: Mahmutović, 2012⁴⁹

Figure 8: An overview of the amount of funds granted for agricultural insurance subsidies (in millions of dinars)



Source: Mahmutović, 2012⁵⁰

The study undertaken by Počuča *et al.* (2013) concludes that the relatively low number of applications is believed to be due to the limited information that farmers have about the agricultural insurance products available and the provision of subsidies offered in Serbia.

However, FAO conducted a flood damage assessment among farmers in 2016 and asked questions regarding agricultural insurance. Many farmers mentioned that despite their willingness, the provision of subsidies by the state and municipality, there are many constraints, such as the relatively high costs of insurance premiums as well as the decline

⁴⁹ Official data of the Ministry responsible for agriculture, presented in the report: Mahmutović, S. (2012): *Podrška osiguranju u poljoprivredi*, Drugi poljoprivredni forum „Hrana za Evropu“, Ekonomski institut Beograd, Subotica.

⁵⁰ Ibid.

by the insurance company to provide coverage for their crops. In addition, the assessment team conducted desk research and held meetings with the insurance companies, in order to follow up on the claims by some of the farmers as well as to examine the actual situation in terms of agricultural insurance against floods.

The results were that most of the insurance companies, in principle, do not insure against floods, which substantially reduces the selection of insurers for farmers. Only a few insurance companies provide insurance packages that cover flood risks provided that

- 1) the basic agricultural insurance package is purchased against fire, lightning and hail, subsequently, insurance against floods can be purchased as an additional option;
- 2) provided that crops are in a location with flood defences (embankments), which are checked by the insurance expert.

As a result, most of the flood affected farmers and in particular in the municipalities of Trstenik, Čičevac, Kraljevo and Čačak, would be rejected by all insurance companies in the country as these municipalities do not have flood defences/embankments. In addition, the insurance companies have various scales and rules for different areas regarding the evaluation of the flood defences and the ultimate decision for the award is given by the insurance expert. Farmers, especially in unclear situations, were discouraged to purchase these high insurance premiums. Also, in Municipalities such as Ivanjica, Arilje, Raska etc., where embankments are not feasible and where farmers are affected by flash floods, the decision will likely be based on the history of flood related events and the need or possibility for flood defences, which will mean that the farmers will likely not be insured against floods.

With regard to cases where insurance of the crops is possible, the farmers have a choice of insuring the yield, the quality of crops or both. Users, who do not have insurance for the quality, are not recognized as eligible for damages, which affect the quality of the products (contamination, hail etc.). As a result, taking in consideration that:

- flood defenses are the responsibility of the Government for the level one watercourses and of the Municipalities for the level two watercourses;
- investments in flood defenses are slow and very costly, and;
- the Government and municipalities have not allocated budgets for flood defenses during the past decades.

Within this context, it is considered unlikely that the the impacts of regularly occurring floods on the agriculture sector in Serbia will soon improve through farmers using agricultural insurance to mitigate and manage their flood risks as it is closely linked to the lack of flood defences as one of the prerequisites.

Conclusions and recommendations

Compared to Albania, Bosnia and Herzegovina, Macedonia and Montenegro, Serbia has developed and established several legislation and policy documents to transition from a reactive emergency response towards a proactive disaster risk reduction approach to build the resilience of communities to current and future external shocks and stresses. Although some of these documents have not yet been adopted, such as the new proposed DRRM law developed in 2016 titled 'Law on Natural and other Hazard Risk Reduction and Emergency Management'. It is crucial that this legislation is adopted in order to for roles and responsibilities of the various relevant stakeholders to be clearly defined and enforced. However, it is not clear when this new law will be adopted. While, the action plan for the implementation of the National Programme for Disaster Risk Management (NPDRM) 2016-2020 was adopted in March 2017, but this programme only included as DRR related activities for the agriculture sector, e.g. flood and forest fire risk maps, early warning systems for forest fires as well as the prevention, control and management as well as institutional preparedness and response capacities of forest fires in Serbia.

In terms of mainstreaming of DRR into agricultural sectoral plans and programmes, the analysis conducted showed that it is quite limited. For instance, in the Strategy of agriculture and rural development of the Republic of Serbia 2014-2024, no link is established between natural hazards and climate change, no mentioning of disaster risk reduction as a objective, priority area or output as well as no specific agricultural DRR measures were mentioned as well as the lack of the inclusion of any gender or gender sensitivity or equality addressed in these measures.

Similar results were found in the Forestry Development Strategy for Republic of Serbia, 2006, which refers to forest degradation that further aggravates the impact of natural hazards, such as floods as well as landslides due to heavy rainfall. No connection is made between natural hazards and climate change and it is mostly focused on the role of forests in climate change mitigation.

In terms of institutional set up and inter-institutional coordination mechanisms, Serbia does not yet have a National Platform for DRR, which is one of the ways in which coordination, collaboration and communication among the relevant actors and sectors can be enhanced. The establishment of this platform is included into the new draft DRRM law, but it is not yet adopted.

The following recommendations are made, based primarily on the desk study conducted and the analysis of the other DRR components included in this report:

Legal, policy and institutional environment

- Adoption of the new DRRM law is essential as well as the National Strategy for DRR that has been drafted, where the agriculture sector as well as other sectors are mainstreamed throughout the document;
- Establishment of a National Platform for DRR to support and strengthen the inter-institutional coordination, collaboration and communication among the relevant organizations at all levels – national, provincial and local self-government;
- Promote the further mainstreaming of DRR into agriculture sectoral plans, policies and strategies and ensure that DRR is linked to climate change to also ensure the tapping into financial resources and funding streams for climate change. This is also highly important, because for farmers the concepts of DRR and CCA are the same as they have been adapting to weather changes for generations;
- Stimulate the inclusion of DRR related measures and technologies for agriculture in policies, strategies and other planning documents, which will help farmers to reduce the adverse impacts of natural hazards, such as floods, landslides and droughts on agriculture and their livelihoods. There is some inclusion and promotion of improvement of irrigation, expansion of hail nets, prevention and control of animal pests and diseases, however other measures should be tested, validated and promoted as well. In particular as the number and severity of natural hazards, due to climate change will increase. Also as farmers will have to reduce the impacts of both floods (water logging) and droughts (water scarcity) within one cropping season. Enhancing the transfer of knowledge and information as well through the testing and validations of these good practices and technologies for DRR is of high importance;
- National and local disaster risk management plans, as well as the inclusion of preparedness activities and contingency planning specifically for the agriculture sector should be developed, which is also included in the new DRRM law;
- Establish a DRR team within the Ministry of Agriculture and Environmental Protection, in order to promote and enhance the implementation of DRR (prevention, mitigation, preparedness for response as well as building back in recovery) in agriculture, which would represent relevant departments and their specific DRR roles and tasks should be integrated into their TORs in order to ensure that DRR is included;
- Better integration of development measures and measures for risk reduction and spending / investing in more effective ways.

Early warning systems

- Improving the access to information for farmers through extension services as well as through the RHMSS, so that they are able to make better informed decisions;
- Drought warnings are undertaken by the RHMSS, through the calculation of Standard Precipitation Index (SPI), however, it is not certain whether soil moisture

or water retention capacity of crops are also analysed to improve drought monitoring in Serbia.

Post-disaster needs assessments

- The existing methodology for post-disaster damage assessment is outdated and requires to be updated in line with international standards and guidelines particularly for the agriculture sector, which is also proposed as an activity in the Action Plan for the Implementation of DRRMP;
- Enhancing pre-disaster baseline data, especially for the agriculture sector, which is highly important for the assessment of post-disaster damage and losses as well as for determining recovery and disaster risk reduction needs. Data need to be collected in a consistent, reliable and accurate manner as well as ensuring that this data is included in a comprehensive risk register;
- Strengthening the capacities of national and local level institutions, in accordance with the international guidelines and standards, for undertaking PDNAs.

Disaster risk assessment, vulnerability and hazard mapping

- Conduct multi-hazard and vulnerability mapping as well as undertake multi-risk assessments as outlined in the new draft DRRM law, in order to help to implement any relevant prevention, mitigation and preparedness for response activities, in particular for the agriculture sector, to reduce the adverse impacts of natural hazards. Especially drought risk assessments to enhance institutional planning capacities;
- Recognise the significant impacts of drought on the agriculture sector. At the moment the SEM views drought only as a condition for wild fires. It seems that the SEM as well as other organisations do not have the mandate to conduct these assessments for drought risks, which should be included in the related national legal and institutional framework;
- Systematically collect, consolidate and analyse damage and losses data. While the impacts of droughts have been substantial on the agriculture sector during the past decades, but what is lacking is reliable, accurate and timely damage and losses data that can inform investments and cost-benefit analyses to reduce the impacts of droughts on the sector.

Agricultural insurance

- Further analyse, if further information can be obtained, on the distribution of agricultural insurance products among large and small scale farmers;
- Obtain more insights into the reasons why the farmers seem to be reluctant to purchase agricultural insurance, despite that 40 percent of the premium is provided as subsidies by the government;
- Promote the removal of the prerequisite of having flood defences in place in various municipalities for agriculture insurance against floods;

- Raise awareness among farmers regarding the benefits of agricultural insurance as a risk transfer tool, to mitigate the impact of natural hazards on agriculture.

The recommendations outlined above are provided as a non-exhaustive list. In general, overall awareness for DRR needs to be raised among all relevant stakeholders at all levels. Most importantly is the adoption of the legal, policy and institutional framework to move a proactive DRR approach forward in Serbia. The implementation of the Action Plan for the Implementation of the DRRMP will address and implement some of these proposed measures and activities in the coming years. However, ensuring that the agriculture sector is not overlooked in the implementation of these DRR activities is highly important as it is one of the most vulnerable sectors to the impacts of natural hazards and climate change.

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