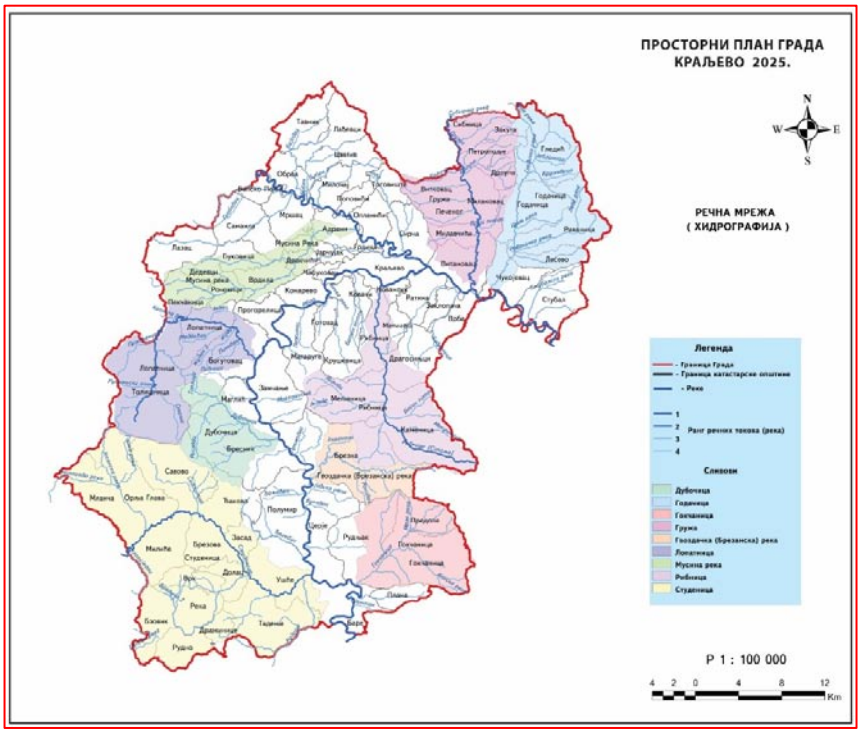
Recovery Planning for Municipality of Kraljevo, Serbia Post March 2016 Floods



UNDP Serbia, 2016

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Abbreviations

BBB	**Build Back Better**
DaLA	**Damage and Loss Assessment**
DRM	**Disaster Risk Management**
DRR	**Disaster Risk Reduction**
FAO	**Food and Agriculture Organization**
GDP	**Gross Domestic Product**
OG	**Official Gazette**
PIMO	**Public Investment Management Office**
PDNA	**Post Disaster Needs Assessment**
PUC	**Public Utilities Companies**
RNA	**Rapid Needs Assessment**
RSD	**Serbian Dinars**
WB	**The World Bank**

Recovery Planning for Municipality of Kraljevo Post March 2016 Floods

1. Introduction

'Recovery' is one of the key components of disaster management. It has been defined as "Restoration, and improvement where appropriate, of facilities, livelihoods, and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors." [1]

It is important to consider recovery as a continuum[2] rather than as a distinct phase of the disaster management cycle. Recovery usually begins in the early days of emergency relief efforts and continues downstream in form of development programmes, recovery continuum should be seen as stretching from pre-disaster planning, to relief and reconstruction, to development. It is important to ensure early on that government and international partners are committed to continue recovery efforts beyond the relief phase to ensure a sustainable pathway to disaster resilience and development.

Table 1: Recovery Continuum

PHASE	RECOVERY CONTINUUM
DISASTER RESPONSE	**0–10 Days** Rescuing Life and Property
DISASTER RELIEF	**0–25 Days** Cash grants, food relief, restoring critical public services, temporary employment generation, emergency needs assessments
DAMAGE AND LOSS ASSESSMENT	**14–45 Days** Baseline data, physical damage, economic losses, impact, needs, disaster risk management
RECOVERY AND RECONSTRUCTION	**20 Days to few Years** Cash grants, asset replacement, temporary employment generation, infrastructure and micro-finance projects, medium and long-term planning
RISK REDUCTION	**Continuous** Building codes, retrofitting, risk transfer mechanisms, risk assessments, land use planning,

[1] *UNISDR Terminology on Disaster Risk Reduction*, Geneva, 2009; *United Nations International Strategy for Disaster Reduction*, 2009 (http://www.unisdr.org/we/inform/publications/7817)

[2] Refer to Handbook for Disaster Recovery Practitioners (www.adpc.net/tgllp/drt)

	awareness raising, institutional development
DEVELOPMENT	**From 20 Days** Local resource based infrastructure development, regular micro-finance projects, local baseline studies, counseling of local governments

It is also important to consider Recovery as an opportunity, since recovery programmes coupled with heightened public awareness and engagement after a disaster afford a valuable opportunity to develop and implement disaster risk reduction (DRR) measures and to apply the 'Build Back Better' principle.

Recovery programmes face a range of challenges, including the identification of suitable agencies; developing policy and plans; addressing sector-specific issues and cross- cutting challenges; mobilizing resources; reaching multiple stakeholders; monitoring and adjusting to meet end goals, a transitioning from recovery to development.

Recovery planning is one of the most important steps of the Post Disaster Needs Assessment (PDNA) process. One of the main objectives for the PDNA is to support the elaboration of the Recovery Strategy as the needs identified by the PDNA beyond national capacity may be used as an evidence base for the mobilization of further international resources in support of recovery.

The recovery planning process starts with the determination of disaster impact and ends with the prioritization of interventions from a response options analysis. The process is anchored in a baseline that includes the pre-disaster development plan (including risk reduction objectives) for the affected area.As a reflection of the development perspective, the Recovery Planning should aim at improving the “quality of life” and the reduction of future risks and vulnerabilities. The recovery vision, therefore should take into accountnot only the pre-disaster level of development but also incorporate a promise to build back better.

2. Background

Serbia is highly exposed and vulnerable to natural hazards and ranks 87 on the world vulnerability list, with the highest score in the region. Serbia is vulnerable to a wide variety of natural hazards, including floods, landslides, droughts, earthquakes, and wildfires. Most frequently, excessive rainfall leads to floods and landslides along major and smaller rivers.

The Municipality of Kraljevo, with 82 inhabited settlements; organized in 66 communities, covers the territory of 1530 sq. km. and is the largest in the Republic of Serbia. Kraljevo municipality is also vulnerable to disasters, particularly floods, landslides and earthquakes. Exploitation and mismanagement of forest and agricultural land as well as uncontrolled urbanization have exacerbated the impact of natural hazards such as torrential floods and landslides. Flood protection and water infrastructure has deteriorated due reduced spending in the water sector over the last 25 years and poor maintenance. Lack of maintenance of riverbeds has weakened the embankments of waterways, which are threatened under a torrential hydrological regime.

According to the findings of Kraljevo Municipality Risk Assessment majority of road network and bridgeswithin the Municipal territory are at risk from landslides and flooding. Unplanned growth,

lack of building codes and illegal construction practices have made the housing sector vulnerable to impact of the floods.

2.1 March 2016 Floods

The floods in Kraljevo municipality were a result of the cyclone which caused heavy yield rainfall. Up to 100 l/m2 fell during 6-8 March 2016, resulting in flash floods. Kraljevo declared an emergency situation due to a continuous threat of flooding and landslides. The most affected territories were in the basins of the first-degree watercourses, as well as those in the territory of torrential watercourses. The landslides, erosions and rockslides were triggered in almost all the local communicates, particularly the municipal roads. Threats of pandemic were intensively present in 3 local communities. Grdica, Adrani and Siča, and the whole territory of the town, but was successfully suppressed by preventive measures and water quality testing.

The whole town of Kraljevo was affected by the floods particularly the following Local Communities: BabskoPolje, MusinaReka, Samaila, Moločaj, Obrva, Adrani, Grdnica, Šumarice, Sirča, Oplanić, Popovići, Milakovac, Vitkovac, Pečenog, Vitanovac, Čujkovac, Stubal, Polumir, Ušće, Tolišnica, Bogutovac, Ribnica, Žiča, Jovac, Vrba, Ratina, Konarevo and Roćevići.

Picture1: Flooded 2nd category roads in Kraljevo Municipality
(Source: www.kraljevo.biz)

On 7/8 March 2016, due to the clogging of riverbeds and the flow of the wave, new floods appeared in in Kraljevo. Large parts of the arable land were rendered unarable. Over 2,000.00 ha of the agricultural land was flooded, primarily in the area of the West Morava Basin and its watercourse.There were reports of a number of roads and bridges damaged in the municipality, which affected the access, potential for evacuation and livelihoods of people. Some mid-size businesses and many other smaller businesses were affected by the impact of the floods. About 200 houses suffered substantive damages; many were flooded so that people had to be evacuated.

Picture 2: Municipal macadam and dirt roads in Kraljevo Municipality damaged by landslides
(source: www.kraljevo.biz)

The efficient response by the Emergency Situation Staff of Kraljevo, in adopting the Order for Evacuation of People, Animals and Movable Property from the flood-affected territories of Kraljevo, was effective in evacuating people and livestock from the flood affected areas, placing them in temporary shelters, providing them with immediate relief and essential subsistence items. There were no records on casualties or injured persons and the town water-management system was regularly supplying drinking water to the residents.

2.2 Disaster Response

2.2.1 Response by the Government of Serbia

The Ministry of Interior – Sector for Emergency Management and local emergency HQs were able to cope with evacuation, without the need for international support. The emergency team used the operational flood protection plans for safety and security measures, deployed water pumping units, specialist water rescue teams and specialized civil protection water rescue units. The Public Investment Management Office (PIMO) requested, assistance from the United Nations Development Programme (UNDP) and Food and Agriculture Organizations of the United Nations (FAO) to assist with immediate damage/loss assessment. FAO was requested to conduct a rapid damage and needs assessment in agriculture sector. FAO has been already engaged in the assessment Serbia's agricultural DRM system and the role of the Ministry of Agriculture and other relevant institutions through a regional initiative. Red Cross, Serbia, 'Medicin Sans Frontier', UNHCR were also involved in emergency relief and aid.

2.2.2 Response by the Local Self-Government

The Emergency Situation Staff observed the situation in line with the Flood Defence Operational Plan for the Second Degree Watercourses and the report of the RHMI regarding the levels of the first-degree watercourses and declared a state of emergency for the whole territory of Kraljevo. On the same day, observing the situation in the field, the Emergency Situation Staff for Kraljevo adopted the Order for Evacuation of People, Animals and Movable Property from the flood-affected territories of Kraljevo.

Protection and rescue forces involved were:

- Emergency Management Sector of the MoI, Department in Kraljevo
- Department for Defence and Emergency Situation and Engineering and Geological Affairs, the Administration of the Town of Kraljevo
- Communal Police Department, Town Administration
- Army of the Republic of Serbia, II Brigade of the Land Forces
- Gendarmerie
- PC "Srbijavode", RJ Čačak
- Centre for Social Work in Kraljevo
- Civil protection forces

The local self-governments' emergency departments evacuated around 300 persons from the flooded areas besides livestock. At Kraljevo, all available manpower and machinery of the Public Utility Companies of Waterworks, Roads and Cleaning, the Communal Police Department were

involved in the activities led by the Town Emergency Situation Staff. “Zapadna Morava” – working unit of Kraljevo, Institute for Public Health in Kraljevo, Veterinary Specialist Institute Kraljevo and Health Centre Kraljevo were also involved in rescue and relief efforts. There were no records on casualties or injured persons and the town water-management system was regularly supplying drinking water to the residents.

Red Cross, Doctors without Borders, UNHCR were also involved in relief efforts for distribution of essential survival kits, food packages, drinking water etc. to the people affected by the floods.
The evacuation was organized protecting all values of the flood-affected local communities, in accordance with the evacuation plan, in line with the main evacuation elements. The following organizations were involved in the evacuation process in Kraljevo.

- Emergency Situation Staff for the Town of Kraljevo
- Technical and Operational Evacuation Team
- Technical and Operational Team for Reception of Population
- Technical and Operational Team for Protection from Animal Diseases
- Communal Police Division
- Police Administration of Kraljevo
- PUC Waterworks
- PUC Cleaning
- PUC Roads
- Emergency Management Sector
- Authorized Personnel
- School Administration
- Agricultural School
- Local Communities
- Citizens

Immediately before and in the course of the emergency situation, the Emergency Situation Staff was in permanent session. Prior to and in the course of the emergency situation, the staff formed additional technical and operational teams in order to control the situation in the field and to have accurate information so as to be able to organize adequate actions – technical and operational team for protection of assets of importance for survival – local water-management systems, technical and operational team for donation reception, technical and operational team for technical support to damage assessment commissions and technical and operational team for fuel oil distribution.

The emergency staff organized a special joint meeting of representatives of all local self-government units in the West Morava Basin, representatives of the central government and Public Utility Water Management Company Srbijavode. The objectives of the meeting were adoption of the adequate decisions for both local self-government level and central level, for long-term resolution of the following issues: monitoring, alerting, response, investments and town planning. They proposed to develop the Strategy for the Improvement of the Flood Defense in the West Morava Basin.

3. Developing Recovery Strategy

With aim to assess the damages and losses incurred due to March 2016 floods- UNDP in partnership with FAO, World Bank and PIMO organized a workshop on **Recording Post Disaster Damages and Losses for March 2016 floods and Developing a Recovery Strategy using PDNA methodology,**

Arandjelovac, 21 – 24 June 2016. The overall aim of the workshop was to capacitate and equip concerned officials on how to conduct Damage and Loss assessments and elaborate the recovery needs in accordance with the PDNA Guidelines, by using the data provided by the local damage assessment commissions.

In order to achieve the above-stated aim, the workshop was designed to:

- Provide an overview of existing post-disaster assessment systems in Serbia and the currently used methodology of assessments (1987)
- Highlight the differences between the present Post Disaster Assessment Methodology used and PDNA methodology
- Introduce the concepts of PDNA methodology and the key procedures involved
- Apply 'learning by doing' approach for Damage and Loss assessments using DaLa methodology
- Develop a Recovery Strategy, which will include the Recovery and Reconstruction needs and prioritize them, in line with PDNA guidelines

The participants for the workshop were both from the National and Municipal offices in Serbia who were involved in post disaster assessments. The facilitators for the workshop were from UNDP, World Bank and FAO.

During the workshop, case study was developed taking into account the assessments made by local self-government in Kraljevo. The participants were divided for assessments on Infrastructure, agriculture and housing and Environment sectors. The data available in the case study was then used to analyse and estimated damages and losses. Depending on the damage and loss estimations, recovery and reconstruction needs were drawn out for the sectors that were under focus.

The experts and resource persons from UNDP, FAO and World Bank guided the participants from National Sectors and representatives of various municipalities with the concepts, steps and procedures that underpin the PDNA methodology. The data obtained from the assessment reports from Municipality of Kraljevo was then used for estimations of Damage and Losses and recovery needs, wherever possible. He participants also elaborated on the Recovery Strategy for Kraljevo, which would include DRR measures and would be effective for sustainable development of the area. Based on suggestions by the participants of the workshop, inputs from the representatives of Government of Serbia and Municipality of Kraljevo, representatives from 0., WB, EU and UNDP and the practices that have been universally endorsed for Recovery post disasters, the important components and outline for Recovery Strategy and Planning for Municipality of Kraljevo has been proposed.

Recovery needs essentially address the financing required to assist affected people to recover the pre- disaster level of household income, to restore the supply and access to basic services of health, education, water and sanitation, etc.; and to ensure recovery of production in sectors of agriculture, industry, commerce, tourism, etc. Reconstruction requirements are the financial resources needed to repair and rebuild destroyed or damaged assets and infrastructure under disaster-resilient standards and conditions. The workshop in Arandjelovac enabled the participants to estimate damages and losses for the sectors- Infrastructure (Transport), Housing and cross cutting sector of environment, utilizing the available data from the post disaster assessment reports, wherever possible.

The financing of these post-disaster recovery needs is majorly through Government funds but also private sector resources (that include personal and enterprise savings, family remittances from abroad, limited insurance proceeds) and soft-term credit from local banking institutions can help.Cash grants and donations from the international community and loans from international financial institutions are very important, especially for developing countries to recover from impact of natural disasters.

Recovery planning for Kraljevo will actually help in addressing longstanding deficiencies and contributing towards the socio-economic development plans of the municipality. Therefore, risk reduction measures and addressing prevailing social vulnerabilities are paramount for recovery and future development agenda of Kraljevo. One of the main challenges for recovery planning for Kraljevo is the present 1987 post disaster assessment methodology that is followed in Serbia as it lacks the mention of recovery needs in its purview. This is a major hindrance for comprehensive recovery planning. Fortunately, the Government of Serbia is taking steps into modification and revision of its present assessment methodology and adapting it in line with PDNA guidelines.

4. Post Disaster Recovery and Reconstruction

According to the PDNA guidelines, Recovery phase includes activities required to restore normalcy to the affected areas and communities, consisting of:

- Repairs of utility infrastructure and restoration of livelihoods.
- Problems related to the economic recovery of the inhabitants of the affected regions are also addressed during this phase. The recovery measures most helpful to affected communities are those that allow victims to return to work, help create new jobs, restart production, reduce debts or improve access to credit.
- Activities designed to rearrange and enable allocation of resources in accordance with the priorities arising from the effects of the disaster[3].
- Activities strengthening the Disaster Risk Reduction and Management system of the country, increasing resilience and improving the activities of the relevant stakeholders.

Post-disaster needs refer to the financial requirements to ensure recovery of social conditions and economic development to at least the same levels that prevailed prior to the occurrence of the disaster, as well as the requirements to reconstruct all destroyed assets under disaster-resilient standards within a building-back-better strategy.The recovery needs should be coherent with the government's broader, longer-term development goals and growth and poverty reduction strategies. The recovery strategy can provide a strategic continuum between pre- and post-disaster development planning by bridging both pre-existing development gaps and new gaps triggered by the disaster.

The aim of recovery activities is to restore the path to achieve sustainable socio-economic development, while that of reconstruction activities is to reduce disaster risk to more manageable levels, with full participation of public and private sector stakeholders under the general guidance and leadership of the Government.Under recovery are included many actions designed to restore the levels of production, personal wellbeing and environmental conditions that prevailed before the

[3]Handbook for estimating The Socio-economic and Environmental Effect of Disaster

disaster occurred. Recovery activities essentially aim to provide the necessary financial support to re-start production and restore social conditions.

The recovery and reconstruction needs for Kraljevo were estimated, wherever possible, depending on data on damage and loss assessments. However, a more qualitative and descriptive analysis of the short, mid and long term strategic recovery measures for the sectors under focus were elaborated in consultation with the participants and representatives from Government of Serbia, which have been stated in the report.

4.1 Recovery Strategy

The first step in developing a recovery plan is to define a clear vision for recovery at the highest possible political and bureaucratic levels of government. It is key to relate this vision to the country's and the municipality's broader development context and its growth and poverty reduction programs. The recovery vision must include input from multi-stakeholder consultations and community participation supporting holistic, sustainable development. The recovery policy should prioritize sectors for recovery, and define key operating principles and performance benchmarks.

Municipality of Kraljevo's recovery strategy should primarily focus on addressing the underlying vulnerabilities in order to facilitate transition from post disaster recovery to development by inclusion of DRR measures. Disaster preparedness and integration of disaster response with the local communities will enable to reduce the vulnerability of the population to further hazards.Efficiency, transparency and accountability are key for successful implementation of recovery plan.

One of the most important aspects of recovery is the need for rebuilding disaster-affected areas for adequate resumption of economic activities so that the employment and livelihood of the people affected by disasters are restored. Essentially the recovery plan for municipality of Kraljevo needs to incorporate the following important components:

- Prioritized goals for overall reconstruction and recovery
- Policy standards
- Timeframe for implementation
- Identification of stakeholders
- Strategic priorities by sector and geographic area
- Functional responsibilities for recovery program managers/relevant government officials

As mentioned earlier the three paramount elements of recovery planning are:

- **Building Back Better:**Building Back Better (BBB) is the reconstruction approach that aims to reduce vulnerability and improve living conditions, while promoting more effective reconstruction.
- **Converting adversity into opportunity:**Disaster recovery can be an opportunity to replace old infrastructure and update service delivery systems with affordable, resilient improvements.
- **Pro-poor recovery**: Prioritizing reconstruction planning to address the needs ofsocioeconomically vulnerable individuals and groups contributes to a more equitable society.

4.2 ImplementingAgencies

The recovery strategy for Kraljevoshould envision the creation of a steering committee to oversee its implementation. The structure should be convened and chaired by the PIMO and should include relevant personnel from Ministry of Agriculture, The Ministry of Interior – Sector for Emergency Management, Ministry of Agriculture and Local Emergency Staff from Municipality of Kraljevo. The institutional mandate for floods protection lies within the Ministry of Agriculture and Environmental Protection (MAEP). The Directorate for Water (DW) under this Ministry, should be involved in implementing recovery plans as it is the responsibility for water resource management and floods protection on "level 1" water courses, drainage, water supply and sanitation services.

The involvement of the three public water companies (PWCs) – Srbijavode PWC, VodeVojvodine PWC and the Beograd vode PWC – is very important as they are responsible for a wide variety of tasks, including operational management of water infrastructure, distribution of water to users, licensing of water resources, as well as hydrological monitoring and floods protection. In the Municipality of Kraljevo, Department of Defense and Emergency situations undertake measures for the operation of the city in war and emergency. Its main functions are: implementing measures for preparedness; organization of protection against natural and man-made disasters, as well as in rescue, relief and recovery; adoption of plans and programs for emergency situations.

Leadership of the government in Recovery planning is paramount and non-negotiable but civil society partners need to be included in the process so that they feel a sense of 'ownership'. Ideally, a single agency should be designated, in the Municipality of Kraljevo, as the focal point for coordinating and empowered with decision-making capacities. Institutional set-up at central and field level is also essential to coordinate the recovery planning.

Civil society and nongovernmental organizations in the municipality should also be involved in order to take advantage of their well-cultivated links with the affected communities. They can enable community participation and managing implementation of recovery plan. Ensuring the participation of civil society and NGOs in defining and implementing the post-disaster recovery right from the inception also provides access to their knowledge and connections, which is essential for the success of recovery.

5. Sectoral Recovery Plans

The identification of priority sectors for recovery was inferred during the workshop at Arandjelovac (refer section 3) the detailed needs and damage assessment carried out at the PDNA exercises during the course of the workshop. The recovery planning for sectors under consideration such as Agriculture, Infrastructure (Transport), Housing and Environment (including water and sanitation) has been elaborated in the following sections. The estimations for recovery needs have been taken from the PDNA report for Kraljevo, which was developed on the basis of results of the table-top exercises during the workshop in Arandjelovac(ibid). The recovery needs were essentially estimated based on the data available. Due to the paucity of data some estimates could not be carried out but the measures needed have been stated.

5.1 Agriculture Sector

5.1.1 Recovery Needs

In the agriculture sector the recovery needs include provision of agricultural inputs (seeds, seedlings, fertilizers, fuel, fodder, plant protection material, tools etc.) to re-start agricultural production. There was a limited impact on the livestock and the animals had to be shifted to temporary shelters. There is a need to rehabilitate them and provide animal feed. However, the number of animals affected was not provided by the assessment reports. The reconstruction activities require repair and restoration of the infrastructure required for agriculture. There is a need to restore the agricultural land and clean it of all the sediments and debris caused due to floods. Along with restoration of agricultural land it is important to include soil improvement measures. Emergency loans to support local agricultural enterprises will be helpful to tide over in case of future losses that have not been accounted for. An overview of the recovery and reconstructions needs is given in Table 16, with cost estimates wherever possible[4]. The details of short term, mid-term and long-term strategic needs for recovery for agriculture sector are given below.

Table 2: Recovery and Reconstruction Needs in Agriculture Sector

RECOVERY and RECONSTRUCTION NEEDS	Estimated Value in RSD (million)
RECOVERY	
Provision of seeds and other inputs for planting the next crops	28.82
Assistance to farmers in case of further losses	27
RECONSTRUCTION +BBB	
Repair and rehabilitation of agriculture land	4.6
Soil improvement/rehabilitation of lands that received sediments (BBB)	X
Repair and restoration of infrastructure needed for agriculture	0.14
Tehnical support in reconstruction and recovery (advisory)	X
Develop a municipal level plan on expansion and upgrading of agricultural infrastructure	X
Development of early warning system tailored for farmers	X
Training and capacity building activities	X

Short-term strategic measures (6 months)

- Provision of inputs (seeds, fertilizers, disinfectants, etc.) to farmers whose crops were lost due to the disaster, to ensure next year´s harvest. These would be the priority support measures to the farmers.
- Removal of debris and other harmful materials from flooded arable lands. The disposal of debris needs to be done with ample considerations for environmental impacts.

[4]Taken from the data for PDNA Kraljevo Report which was developed based on workshop at Arandjelovac, 21-24 June 2016

- Restoration of agricultural infrastructure with emphases on immediate repair and rehabilitation of high priority irrigation schemes, watercourses, storage tanks and wells, is the need of the hour in Kraljevo.
- Technical support for reconstruction and recovery activities in agriculture and build back better practices; need to be integrated into all the procedures right from the inception of recovery and reconstruction processes.
- An analysis of the existing agricultural system and legislative framework in Kraljevo municipality is essential. This would help strengthen the capacity of the staffs of municipal Agricultural Department/ Division and relevant agencies, to deliver national and local legislation, policies and strategies on disaster risk reduction, through technical advice, human resources and expertise, training, practical tools and services.

Mid-term strategic measures (6-18 months)

- Experts need to be deployed (agriculture and environmental experts) on how best to optimize the use of the farm-lands (multiple crops, etc.).
- Replacement of lost and damaged equipment and domestic animals.
- Develop a municipal level plan on expansion and upgrading of agricultural infrastructure (irrigation, flood protection, storage facilities, access to market the products) in accordance with the BBB concepts: i.e. incorporation of DRR and climate change aspects (usage of materials, location, etc).
- Conduct a market research to enhance the promotion of local products
- Development of Agricultural Sector-specific municipal level strategy on disaster risk reduction addressing concerns across such areas as agriculture, forestry and natural resource management (sustainable agriculture – hazard resistance crops, sustainable water management and utilization, environmental protection and climate change adaptation practices, etc.).
- Development of early warning system tailored for farmers.
- Organization and conduction of trainings of trainers for selected local authorities in Kraljevo on PDNA.

Long-term strategic measures (18+months)

- Capacity building of the communities on sustainable agricultural practices.
- Compensation of the value of the destroyed farmland.
- Mobilization of resources and implementation of the risk reduction strategy for agriculture.
- Preparation of a plan, based on the findings of the market research, for expansion of the market for local products and implement the plan
- Reformation of insurance policy and development of policies, laws and management systems that improve the resilience of the Agricultural Sector in the future

5.2 Infrastructure - Transport

5.2.1 Build Back Better

Reconstruction of Kraljevo transport sector including roads, bridges and embankments should be conducted with the implementation of disaster-resilient features. Such measures would encompass comprehensive inter-sectoral involvement of various experts the likes of engineers, geologists, economists and hydro engineers. Introduction of disaster risk reduction measures in road works are

estimated at a total of 140 million RSD (90 million RSD for DRR measures and additional 50 million RSD for costs of construction and material). "Build Back Better" costs concerning bridges are estimated at 28 million RSD (13 million RSD for hydrology assessment, 5 million RSD for project documentation and 10 million RSD for construction material). Finally, flood protection works concerning embankments are estimated at 20 million RSD in cost of construction and material.

Table 3: Build Back Better needs in Kraljevo Municipality

Item	BBB (in mil RSD)
Road	140
Bridge	28
Embankments	20
Railways	0
Air transport	0
TOTAL	188

(source: PDNA table-top exercise)

5.2.2 Recovery Needs

The resilience of transport sector in Kraljevo is in fact represented through its capability to resume operations at a level similar to that before the flooding occurred. In that concern recovery has to encompass all the steps necessary to recover the transport capacity that was lost during the March 2016 flooding. Therefore, total recovery needs have to involve costs of damages, costs of losses incurred during response phase and costs of services discontinued during flooding, as well as more "flood resilient" BBB measures introduced in new and improved infrastructure. Therefore, the overall recovery costs following March 2016 floods in Kraljevo including damages, losses and build back better reconstruction add up to a total 1,016 billion RSD.

Table 4: Overall Recovery Costs for transport sector, iKraljevo Municipality

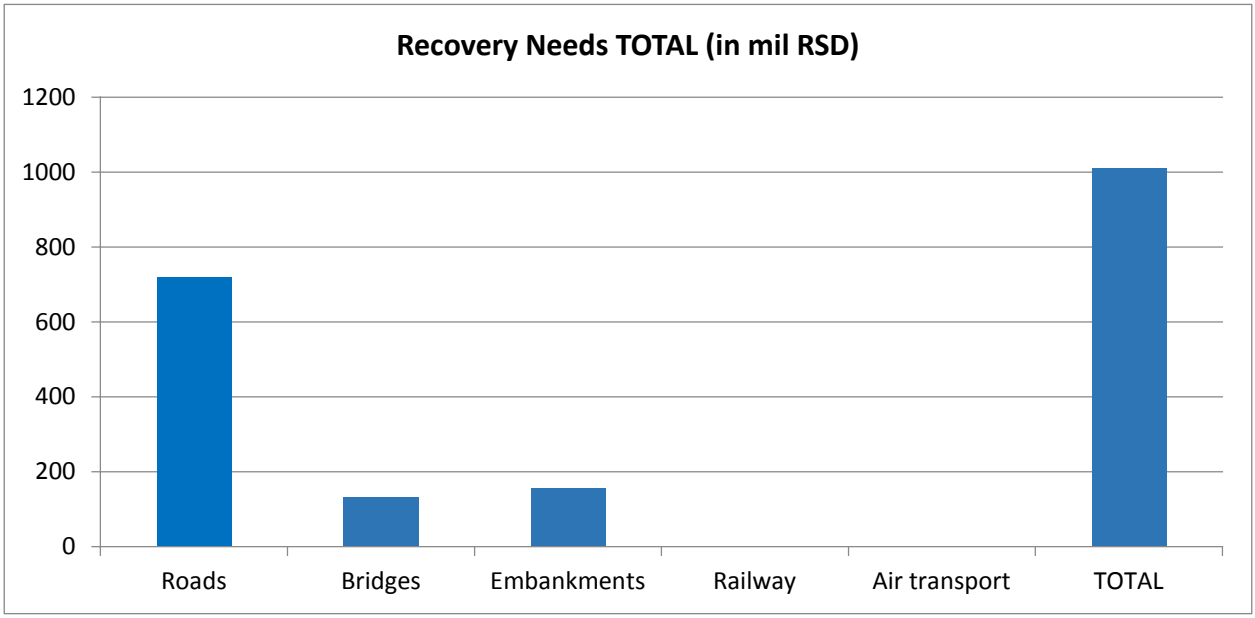
Item	Damage (in mil RSD)	Loss (in mil RSD)	BBB (in mil RSD)	Recovery needs TOTAL
Road	510	68,72	140	718,72
Bridge	105	0	28	133
Embankments	95	50	20	165
Railways	0	0	0	0
Air transport	0	0	0	0
TOTAL	710	118,72	188	1016,72

(source: PDNA workshop table-top exercise)

More than two/thirds of total recovery costs (718,72 mil RSD) are considered to be costs concerning roads whilst costs of bridges and embankments are represented with 10-15 % in overall recovery costs respectively (133 mil RSD in bridges and 165 mil RSD in embankments). This is pointing to the fact that it is indeed road infrastructure the most vulnerable item within transport sector. However, without tending to bridges and embankments as underlying causes for road damages overall future

recovery costs could not be properly addressed which is subsequently calling for comprehensive programmatic approach.

Chart 1: Total Recovery Needs for transport sector, Kraljevo Municipality



(source: PDNA workshop table-top exercise)

5.2.2.1 Recovery Planning

It is without a doubt that damages to the roads and bridges, damages to embankment and flood protections costs, landslides and mudslides that have furthermore threatened infrastructure including all the other costs associated with traffic communication disruption have affected immediate costs. This has all produced short-term impact on economic and social life in Kraljevo for at least 5 days, and in some local communities even longer than that. Most commonly recognized problems were difficulties in accessing hospitals, markets, work and school so the use of alternative routes where possible was introduced as a short-term solution. Besides that, due to traffic disruption even the local and city administration including emergency services faced problems in lacking access to their respective facilities. And finally, during this first response phase other issues were raised as well the likes of the question of jurisdiction in terms of regional and local roads, damaged bridges on watercourses of second category etc.

It is for this reason that the Kraljevo City Authorities concluded and launched the initiative to organize a joint meeting of representatives of all local governments in the basin of the West Morava, representatives of the Government of the Republic of Serbia and the Serbian Public Utility Waterworks Company. On April 7, 2016 in Kraljevo this joint meeting took place (participated also by PIMO and UNDP) with the objective to adopt appropriate decisions aimed at joint defense against floods, both at local government and national level. Meeting recommendations went into the direction of solving the long-term issues in terms of introduction/strengthening of early warning systems (monitoring, informing), protection and response capacities, investment and urban planning. Conclusively, it was proposed to develop studies to improve the protection against flooding in the basin of the West Morava and the establishment of a regional center in this part of Serbia.

Other long-term impacts in terms of transport were also discussed, as it is inevitable that the March flooding will potential produce negative economic impact on transit transport since the floods have

affected the international road transport too. Besides that, potential transport disruptions could have negative impact on tourism due to transport problems and the vicinity of National park Kopaonik and Golija, Spas (Mataruska, Vrnjačka) and medieval monasteries Studenica and Zica. Furthermore, transport problems could adversely impact provision of health services as the Medical Center in Kraljevo is in fact a regional center and therefore affects neighboring local communities i.e. all municipalities gravitating to Kraljevo Medical Center. All of this is particularly exacerbated in terms of vulnerable groups namely persons with special needs, disabled, elderly, women, children and especially a large number of displaced persons (more than 22000 in the area of Kraljevo). With that concern, prioritization of strategic infrastructural measures is as follows:

Short-term strategic measures (6 months)

- Reconstruction of the most critical transport routes (following the prioritization assessment)
- Provisional strengthening of embankments (in cooperation with Waterworks Public Utility Company)
- The construction of alternative routes – adaptation
- Enhanced cooperation with the housing sector (troubleshooting citizens´ problems regarding transportation and meeting their basic needs, health care, water supply etc.)
- Strengthened communication with: local level authorities, public utility companies , schools and health institutions, private entrepreneurs (private sector) and public sector
- Development of needs assessment and action plan (deadlines, responsible persons, financing, etc.)
- Implementation of construction works
- Organization of public forums (awareness raising).

Mid-term strategic measures (6-18 months)

- Rehabilitation and reconstruction of embankments (BBB)
- Implementation of construction works (BBB)
- Expropriation of land
- Preparation of project documentation
- Recovery od landslides
- Implementation of risk assessment
- Cooperation with the national level authorities
- Control of the process and progress of reconstruction
- Enhanced monitoring and maintenance of infrastructure facilities.

Long-term strategic measures (18+ months)

- Strengthening public sector
- Construction of new roads (infrastructure development strengthens the region's economic development however in line with environmental aspects)
- Construction of new flood protection facilities (cooperation with water management structures regarding development of new policies and strategies for flood protection and mitigation)
- Multi-sectoral cooperation with respective ministries in terms of education and awareness raising
- Relocation of the road (pending finding of risk assessment)

- Modernization of traffic monitoring (video recording/surveillance of critical traffic infrastructure, introduction of GIS system with landslides) and appropriate capacity building.

5.3 Housing

5.3.1 Recovery Needs

Housing rehabilitation/reconstruction is recognized as one of the key steps in closing gaps between emergency relief and sustainable recovery. It is also one of the first steps to reactivate the productive economy. Building the capacity of national and local authorities to promote, supervise and guide planning and construction processes is essential for a successful and sustainable reconstruction process. In Kraljevo, the central government and local municipalities have to be enabled to set up legislative and regulatory frameworks to promote local initiatives and local involvement in planning and construction issues.

The following key aspects should be taken into account:

- policy and regulatory framework and institutional capacity building;
- land and property;
- financing;
- labour and implementation;
- technology and construction practices (including Build Back Better);
- architectural design;
- construction materials;
- building codes and compliance mechanisms and quality assurance;
- risk reduction measures related to settlement or construction;
- others (e.g. gender, vulnerable groups, etc.).

However, due to limited resources (both human and financial) allocated for this exercise, only key issues from the above list will be addressed in this report. An overview of the recovery and reconstructions needs is given in Table 19, with cost estimates wherever possible. The details of short term, mid-term and long term strategic needs for recovery for housing are given below:

Short-term strategic measures (6 months)

- A more detailed investigation and analysis of consequences of the March 2016 floods
- Debris management (completed)
- Interim Shelters (completed)
- Repair of damaged houses (BBB)

Mid-term strategic measures (6-18 months)

- Inventory of illegal houses and support to the legalisation process (underway)
- A detailed flood risk assessment for the housing sector
- Development of a recovery plan with structural improvements in housing sector (BBB)
- Retrofitting of houses (BBB)
- Facilitation support to house owners and users of state property
- Capacity building measures including training of skilled workers, making building documentation available, etc.

Long-term strategic measures (18+ months)

- Implementation of flood/landslide risk mitigation plan for Kraljevo, including DRR measures (e.g. early warning)
- Development of detailed plan for revision of the existing methodologies of assessment of damages and losses, closing the existing gaps between the existing Methodology (1987) and PDNA
- Strengthening of local governments in pre- and post-disaster activities
- Revision of building codes whenever required (BBB)
- Introduction of new or improvement of current quality assurance, technical standards used, and building codes whenever required
- Incorporation of concrete requirements for the housing sector into the planning procedures and plans at both national and municipal levels (Rural and urban land use plans)
- More details and cost estimations are included in the table below.

Table 5: Recovery and Reconstruction costs for Housing Sector, Municipality of Kraljevo

RECOVERY and RECONSTRUCTION NEEDS	Estimated Costs RSD (million)
RECOVERY	
Disinfection and pest control of the houses, walls and in area around the houses	6,62
Pumping of water	0,62
Cleaning community and households (sludge, furniture, etc.)	2,8
Assistance Provided by Centre of Social Work to assist in temporary accommodation	0.635
Governance: Training of staff and committees to assess the damage, the revision of rules on the construction, updating methodology	0,50
RECONSTRUCTION	
Repair costs for the damaged houses + auxiliary facilities+ BBB costs (10% of the amount)	786.72
Reconstruction needs for houses with significant damages +use of more resilient and better materials (BBB)	12,64
Risk reduction through the development of low cost early warning systems and alarms	0,3
Purchase of furniture	4,31
Procurement of household appliances	3,95
TOTAL	819,09

5.4 Environment and Water Supply and Sanitation

5.4.1 Recovery Needs

The main activities envisaged for the recovery of the environment and water and sanitation are so that the conditions are restored to pre-disaster conditions and enable the people to return to normalcy. The recovery measures most helpful to affected communities are those that allow victims to return to work, restart production flows, improve access to services, restore governance and reduce risks and vulnerabilities. An overview of the recovery and reconstructions needs is given in Table 20, with cost estimates wherever possible. The details of short term, mid-term and long term strategic needs for recovery are given below:

Short Term strategic measures (0-6 months)

- Disinfection of roads and pavements, green areas etc. is an urgent requirement after floods to ward off any dangers of epidemics. These will include the collection, transport and environmentally safe disposal of debris and mud generated by the floods and landslides.

Table 6: Recovery and Reconstruction Needs for Environment and Water and Sanitation

RECOVERY	Estimated Value (RSD)
Decontamination of water for pollutants	X
Disinfection of water supply	10
Collection and disposal of disaster waste	1.05
Provision of water supply to the affected population	9,37
Disinfection of roads and pavements, bearing walls and green areas	4,63
RECONSTRUCTION	
Stabilization of slopes	55
Repair and Water supply system at Village Sirca + BBB	X
Redrafting of land use plans	0.3
2 additional dumper trucks for solid waste collection	13.5
Investments in improving the waste water management	X
Training, capacity building and community awareness programmes	X
Upgrade of landfill sites using appropriate technologies	X

Source: PDNA workshop table-top exercises

- Removal of collected water from the streets is an urgent requirement to restore commuting and people's ease of life.
- Cleaning and disinfection of wells (rural and urban) and unblocking sewers as well as of the water supply network is necessary.
- Provision of drinking water using cisterns/water tanks/tankers trucks and the costs of any other additional water quality analyses are also immediate recovery needs.
- Although, solid waste management facilities were not assessed post floods it is presumed that the collection activities would have been suspended and they need to be restored too for maintaining the hygiene of the area.
- The repair of water supply system at Sirca would be one of the main reconstruction needs.

Mid Term strategic measures (6-18 months)

- Care should be taken to observe any contamination of ground water as well as other sources of water, as an after effect of the floods, so that measures are taken to decontaminate and restore the systems as soon as possible.
- Although there were no reports on forests being destroyed or any impact to the biodiversity and the wildlifeinthe area, it would still be wise to take additional steps for protection of the biodiversity in the area.
- Reconstruction needs should look to 'Build Back Better' or rather for environment 'Build Back Greener'. Reconstruction needs for environment would involve mainly the stabilization and remediation activities in landslide-affected areas. It would effective to look into the forested areas to see if any reforestation is required.
- The drinking water quality is at risk due to poor infrastructure, therefore more investments are needed to introduce improved standards of design for the water supply systems and monitoring the water quality
- Wastewater facilities at the Municipality need to be upgraded along with better provision of solid waste management practices.

Long -erm strategic measures (18+ months)

- In the long term, the role of natural flood management and green infrastructure needs to be further strengthened in the area. Nature and resources based management helps for ex. In improving the soils water storage capacity and conserving water in natural systems, which in turn helps in preventing floods and soil erosion. This ecosystem-based DRR approach is a more efficient and cost effective way of flood management rather than simply focusing on physical infrastructure for combating the effect of floods.
- Looking at the area impacted by floods, it is also important that risk hazard maps are drawn out and land use planning is undertaken. Along with ecosystem based DRR, these measures will improve the environmental conditions in Kraljevo which would enhance the physical and mental well-being of its citizens.

- The Ministry of Environment and Agriculture ministry should encourage and stress the need for integrated pre-development planning, as it will reduce risks of damages to the environment by natural disasters.
- Mainstreaming DRR into the Water and Sanitation sector involves the reconstruction and retrofitting of facilities so that they are hazard-resilient. The location, design and construction of these facilities must take all types of hazard risks into account.
- Adopting clear policies on the development of Water and Sanitation facilities, and supported by the training of staff on incorporating DRR into the construction / development of these facilities and coordination at all levels.
- The disposal sites for the debris are often the same as the uncontrolled solid waste management disposal sites. The disposal sites are generally non-engineered (without liners and appropriate cover) which can lead to the uncontrolled disposal and spread of municipal solid waste, including electronic wastes. The reconstruction activities also need to look into building better landfill sites using appropriate technology.
- There should be community awareness building programmes to understand the direct and indirect effects and costs of Water and Sanitation facilities due to disaster. Comprehensive and regular capacity building process of the community and other stakeholders is needed to increase and maintain their ability to face any future disaster.
- All Water and Sanitation services should be gender sensitive and must take into account the needs of both male and female population. Particular focus should also be on the vulnerable population which includes the elderly, children, disabled and the marginalized communities.

6. Recommendations for Recovery Planning

The disaster has made evident a number of vulnerabilities of the Serbian population and economy that – in view of climate change – deserve special attention and require the reduction of disaster risks. Improved strengthening and expansion of floods control systems, flood-forecasting and prevention activities, and physical planning to avoid locating homes and production activities in flood-prone areas, are some of the required activities to be carried out in the near future.

The Recovery Needs for Municipality of Kraljevo were assessed for agriculture, Infrastructure, Housing and Environment sectors and short, medium and long-term strategic measures, required for recovery from the effects of the floods, were elaborated. The municipal as well as the central government will need additional assistance from various international organizations and funding agencies in order to effectively address the interventions necessary for recovery from the effects of the floods. For Municipality of Kraljevo and Serbia should consider the floods as an opportunity to build back better and address the deficiencies in the system. They should view the recovery and reconstruction program as an integral part of socio-economic development plans and risk assessment should be made an integral part of the development agenda. Socially vulnerable groups should be focussed especially in the development of risk profile.

Municipality of Kraljevo needs to ensure that recovery strategies clearly establish roles and responsibilities for all actors, including mechanisms to hold all stakeholders accountable. It should also use the recovery planning process to align all actors behind its risk reduction agenda. Strengthening the coordination of recovery actors to avoid gaps and increase focus on resilient recovery interventions should be paramount.

The following are the recommendations for the sectors that were undertaken for the table-top exercises during the workshop at Arandjelovac:

Transport sector

Development of City of Kraljevo transport sector should be aligned with the strategic document "City of Kraljevo Development Strategy 2015-2020".[5] In that concern all the transport issues should be reflected in specific goal 2.2. "Traffic infrastructure in the City area enabling good quality connection and high level of safety". That being said, a total of 33 respective projects are proposed for implementation dealing with development of project documentation and reconstruction and/or building of traffic infrastructure. Even though traffic infrastructure is in the very essence of each development strategy and therefore connected to all specific goals, for the purpose of this paper its connection to the specific goal 3.3. "Improving and introducing responsible policies in the area of safety and protection of city and citizens" is reflected in following conclusions/recommendations:

- Development of tailor-made Needs Assessment and action plan dealing with transport sector in the city of Kraljevo. This Needs Assessment/Action Plan should include timelines, responsible persons, financing, etc. and it should also prioritize future project investments and planning.
- As an urgent measure (short-term action) most critical traffic routes should be reconstructed, damaged embankments provisionally strengthened, alternative roads adapted and reconstructed, debris around the bridges cleaned, landslides temporarily secured.
- All the undertaken initiatives should include all the relevant stakeholders i.e. local level authorities, public utility companies, schools and health institutions, non-governmental organizations, private entrepreneurs (private sector), public sector and housing sector (troubleshooting citizens´ problems regarding transportation and meeting their basic needs, health care, water supply etc.)
- Awareness raising actions should be organized tackling the problem of ecological awareness which is the underlying risk leading to flooding (public forums and open discussion concerning the problem of citizens throwing litter in the rivers).
- As a mid-term measure project documentation is to be prepared so that the implementation of construction works could begin. These works should follow the Build Back Better principle in overall rehabilitation, recovery and reconstruction projects namely with embankments, roads and landslides.

[5] http://www.kraljevo.org/cms/mestoZaUploadFajlove/21012015%20STRATEGIJA%20RAZVOJA%20GRADA%20KRALJEVA.pdf

- The overall reconstruction process is to be closely monitored and traffic infrastructure facilities maintained so that future risks are mitigated (e.g. riverbeds and embankments are to be cleaned from grass, bushes and debris).
- As a precondition for successful implementation of long-term goal cooperation with regional bodies/institutions as well as cooperation with national level authorities is to be enhanced and formalized. This will lead to the strengthening of the public sector and better understanding of disaster risks (e.g. with the better positioning of Civil Protection authorities) and overall multi-sectoral cooperation with respective ministries not only in terms of reconstruction but also in terms of education and awareness raising leading to general capacity building.
- Emphasizing the importance of disaster risk reduction should lead to adequate implementation of risk assessment findings with relocation of the roads, expropriation of land, construction of new traffic infrastructure thus making it less vulnerable to the effects of disasters.
- That being said, new roads and new flood protection facilities are to be constructed (still in line with environmental aspects and flood protection/mitigation strategies) and modern technological solutions introduced (traffic monitoring i.e. video recording/surveillance critical traffic infrastructure, introduction of GIS system with landslides).

Housing Sector

- During recovery and reconstruction, it is recommended to maximize the use of alternative energy sources, more resilient and better materials ("green" materials)
- Drastically increase energy efficiency in the housing sector
- An action plan needs to be put together and implemented on how the current housing conditions could be improved in Kraljevo
- Reduce vulnerability of various social groups with particular focus on the poorest layers of the society, middle-income and young families, expand construction of social housing
- Development and implementation of the City Housing Strategy
- Improve investment climate for funding of required maintenance of housing multi-family houses

Agriculture sector

- Strengthen the capacity of the Ministry of Agriculture and relevant agencies in Kraljevo, to deliver national legislation, policies and strategies on disaster risk reduction, through technical advice, human resources and expertise, training, practical tools and services
- Development of Agricultural support services for agricultural rehabilitation, such as extension services, farming schools, technical expertise, capacity building training, etc.).
- Development of Agricultural Sector-specific national strategies on disaster risk reduction across agriculture, forestry and natural resource management.
- Assessment of the possibilities for improvement of the Agricultural insurance system, enabling coverage of farmers in higher risk areas and development of state support mechanisms which enable improved agricultural insurance coverage

- Development of a state subsidy system which compensates farmers for limited activities in disaster prone areas

Environment and Water supply and Sanitation

- Water supply system in Kraljevo needs upgradation and investments to improve standards of design for the water supply systems and to check and improve the water quality
- Mainstreaming DRR into the Water and Sanitation sector is needed and will involve the reconstruction and retrofitting of facilities so that they are hazard-resilient.
- The water supply network needs to be extended to rural areas in Kraljevo and regularised so that people are not dependent on alternative sources of water supply
- There should be community awareness building programmes to understand the direct and indirect effects and costs of Water and Sanitation facilities due to disaster. Comprehensive and regular capacity building process of the community and other stakeholders is needed to increase and maintain their ability to face any future disaster.
- The role of natural flood management and green infrastructure needs to be further strengthened in the area for a cost effective solution to flood management. Ecosystem based DRR, reforestation, biodiversity protection etc. would help in harnessing nature's capacity to absorb or control disaster impacts in urban and rural areas.
- In the long run, the role of the Ministry of Environment and Agriculture along with Municipality of Kraljevo needs to be more proactive and encourage and stress the need for integrated pre-development planning as well as land use planning, as it will reduce risks of damages to the environment by natural disasters. The hazard and risk assessments of Kraljevo should integrate mitigation strategies and embed the concept of building back greener.
- In order to improve future post-disaster assessments, it is recommended that a mechanism be put in place to monitor environmental degradation. This will help to create a baseline, which will inform any environmental impact assessments undertaken. In turn this will enable the value of damage and loss to the environment to be taken into consideration and consolidated with sectoral damages and loss assessments undertaken by local municipal authorities and the national government in future.

Most importantly, Municipality of Kraljevo with support from the National Government, needs to build its resilience, upgrade its DRM agenda to not only focus on traditional risk mitigation through structural engineering measures, such as floods protection systems but also take into account, non-structural measures such as risk-informed spatial planning, enhanced weather forecasting and early warning, ecosystem based DRR and disaster risk financing and insurance solutions.Risk mitigation measures, and DRR as a whole, need to be further mainstreamed into the ordinary life of people and governance systems.

Disaster risk financing is another strategy that will help the Government, businesses, and people access financial protection and risk transfer solutions, such as insurance. Also helpful would be establishing national disaster funds to ensure fast disbursement and execution of financial resources to the municipalities, in the aftermath of a disaster. These financial resources will also help in conducting

efficient and transparent post-disaster damages assessments. Disaster recovery programs should include the provision of direct livelihood support, income generation opportunities, improved access to finance and microcredit, and new skills training. Governments should also enable recovery by subsidizing or facilitating the reconstruction of private assets, such as housing and local business enterprises.

Economic situation of Kraljevo is characterized by a high unemployment rate, low living standards and considerable level of poverty in some pockets of the municipality. Unemployment rate has been steadily rising in Municipality of Kraljevo since 2007 and was assessed at 34,9% in the year. The recovery and reconstruction needs as well as incorporating DRR and sustainable 'greener' technologies in the recovery planning will also give an impetus to uplift the socio-economic profile of the municipalities by providing employment and social benefits to the communities, especially the marginal communities and women.

For the betterment of economic situation of Kraljevo and to be able to built back better after a disaster, the participation of the private sector in recovery planning and operations is paramount. Linking private entities to the official response and recovery institutions in the form of public-private partnerships (PPPs) would be very beneficial as PPPs will enhance both the government's and the private sector's ability to recover from financial losses; and damage to infrastructure, equipment, products etc. Disasters impact unevenly the most vulnerable population including women, children, the elderly, the poor, the disabled and minorities. It is important to identify the vulnerable groups in recovery planning and implementation to meet the specific and special needs of each group.

The identification and selection of beneficiaries has always been a challenge in recovery programmes, as issues of equity, equality, gender, economic status, type of damage, and risk have implications, especially when limited resources are available. It is important to segregate data by gender and vulnerable groups in surveys and assessments in the early stages of recovery so that strategies and programmes are responsive and so that there can be effective and efficient monitoring and evaluation.

After an extensive review, the present 1987 Post Disaster Assessment Methodology, being used in Serbia, was found to be very comprehensive but it needs to be updated in accordance to the present times, incorporating the use of available modern technologies, in line with the PDNA methodology. Therefore, Municipality of Kraljevo would benefit from adopting Post Disaster Damages and Needs Assessments (PDNAs) and Recovery Frameworks (RFs) to guide the recovery process. The Serbian Government is already taking steps towards integrating the PDNA methodology in line with the provisions of the draft National Action Plan to implement the National Disaster Management Programme, Component Six (6.1.1.). The adoption and integration the PDNA methodology into national and local governance systems will further enable the national and local self-governments to develop and implement recovery plans more comprehensively in the future.