



**SOLID WASTE MANAGEMENT IN CROSS-BORDER
RURAL AND COASTAL AREAS OF SOUTH EASTERN
EUROPEAN REGION**

Process Paper No. 1

Assessment of the cross-border adverse environmental and economic impacts in the pilot regions of Adriatic Coast, Sharra Mountain and river catchment Tara - Drina - Sava

Published by:
Open Regional Fund for South East Europe – Modernisation of Municipal Services (ORF MMS)

Contact person:
Christophe di Marco, Sector Fund Manager
T: +387 33 957 541
E: christophe.dimarco@giz.de

GIZ Regional Office Sarajevo
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Zmaja od Bosne 7-7a
Importanne Centar 03/IV
71000 Sarajevo / Bosnia and Herzegovina
T: +387 33 957 500
F: +387 33 957 501
I: www.giz.de/regional-funds-southeasteurope

Name of the sub-project: Solid Waste Management in cross-border rural and coastal areas of South Eastern Europe (SWMRCA)

ORF MMS Office in Skopje
Contact person for the sub-project:
Hari Shutoski, Sub-project Manager
Aminta III, No. 37, Building 1 (1st floor)
1000 Skopje / Macedonia
T/F: +389 2 3126 450
E: hari.shutoski@giz.de

Authors:
Valentina Nushkova
Hari Shutoski

Acknowledgement:
Boban Ilic
Katerina Spasovska
Bogdanka Gjorshoska
Boran Ivanoski
Ana Petrovska
Predrag Markovic
Tush Markaj
Milena Radosevic
Zhaneto Sokoli
Shpetim Quku
Danijela Djurovic
Irem Silajdzic

Layout:
Ljubomir Arnaudov

Printing:
Print house Evropa 92 – Kochani, Macedonia

Skopje, June 2016.

CONTENTS

1.	Background	3
2.	Methodology	5
2.1	Process of assessing the cross border adverse environmental and economic impacts	5
2.2	Implementation Structure	7
2.3	Key phases of the assessment process	8
2.3.1	Phase 1: Development of the method for assessment of cross-border adverse environmental and economic impacts	8
2.3.2	Phase 2: Data collection and data validation process	9
2.3.3	Phase 3: Organisation of Assessment Workshops (one-day events)	10
2.3.4	Phase 4: Organisation of 1st Dialogue Platform (DP) Sessions (two-day events)	10
2.3.5	Phase 5: Consolidation of the 3 Assessment Reports	11
2.3.6	Phase 6: Organisation of 2nd Dialogue Platform Sessions (two-day events)	11
3.	Key Messages	13
4.	Key findings	14
5.	Challenges	16

FIGURES

Figure 1: Major activities and process flow of SWMRCA sub-project	4
Figure 2: Process of assessing the cross border adverse environmental and economic impacts	5
Figure 3: Assessment of the cross-border adverse environmental and economic impacts in the pilot regions of Sharra Mountain, Adriatic Coast, and river catchment of Tara-Drina-Sava	6
Figure 4: Implementation structure of the assessment process	7
Figure 5: Scope of the Method of Environmental and Economic Impact Assessment	8
Figure 6: Origins and pathways of the floating waste and/or pollution, and position of the municipalities	9
Figure 7: Focus group topics related to needs, root problems and common challenges, and best practices	11
Figure 8: Extent of adverse economic impacts in monetary terms	15
Figure 9: Major challenges with solid waste management in the 3 pilot regions	16

1. BACKGROUND

The sound environmental protection practices and efficient systems for managing solid waste become increasingly important in attaining full-fledged and sustainable development. The South-East European region still lags far behind in preventing the adverse impacts caused by the insufficient waste collection and inappropriate disposal. These impacts frequently extend beyond the municipal and national borders. Therefore, an integrated and cross-border approach is required to effectively address the root causes of the impacts and to attain long-lasting, sensible and sustainable solutions.

The sub-project “Solid Waste Management in cross-border rural and coastal areas of South Eastern European region” (SWMRCA) was initiated with the aim to improve the conceptual and organisational framework conditions for integrated solid waste management in the rural and coastal areas. Its specific goals are to assess the cross-border adverse environmental and economic impacts and to develop models for integrated solid waste management that are environmentally effective and economically affordable.

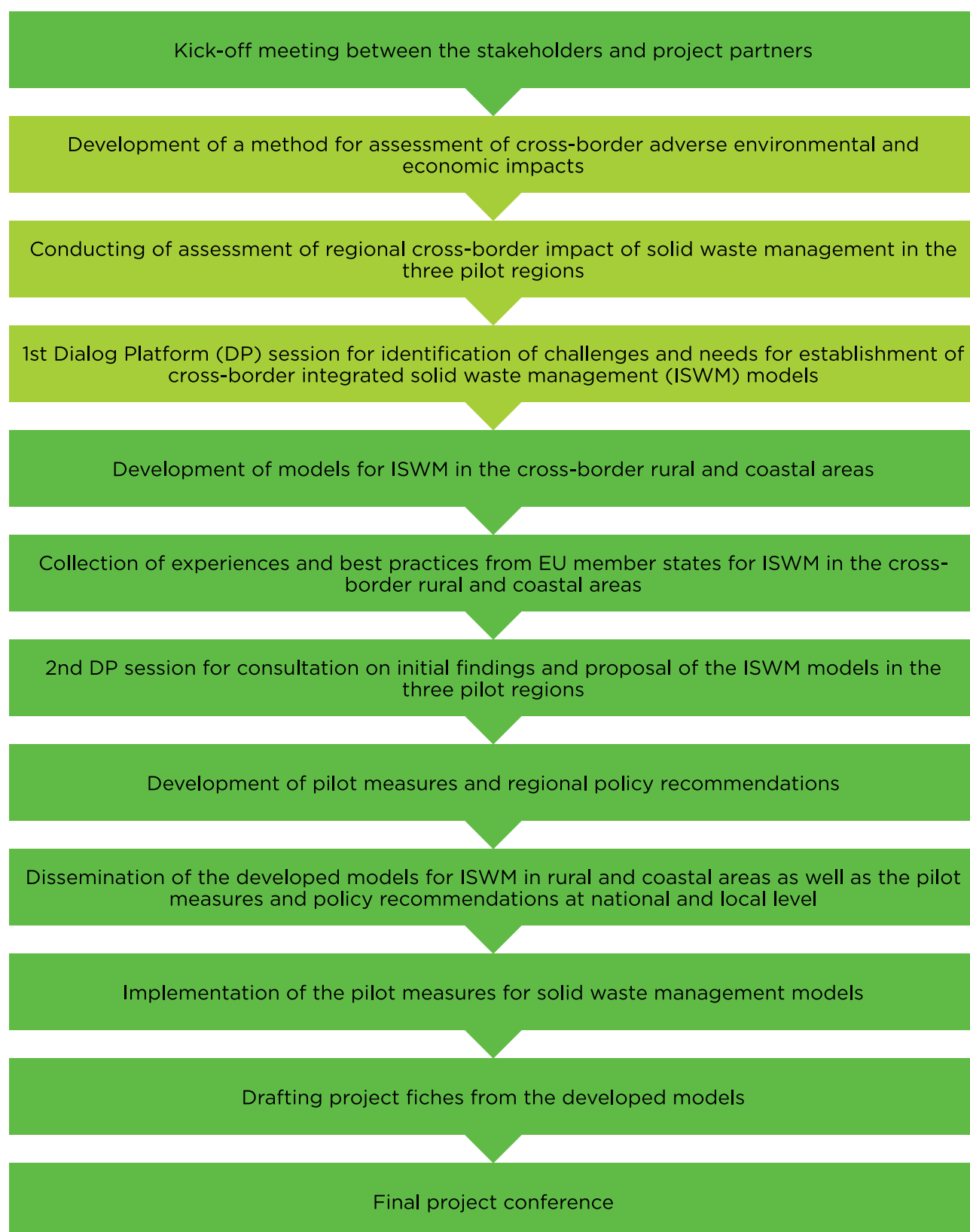
The SWMRCA sub-project is supported by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Government of Switzerland through the GIZ Open Regional Fund for South East Europe - Modernisation of Municipal Services (ORF MMS). The implementation partners are the Regional Rural Development Standing Working Group (SWG) and the Network of Associations of Local Authorities of South-East Europe (NALAS).

The sub-project covers three cross-border pilot regions: the Adriatic Sea coastal region (Albania, Montenegro, Bosnia and Herzegovina, and Croatia); the mountainous region of Sharra Mountain (Albania, Kosovo and Macedonia); and the region of the river catchment Tara - Drina - Sava which consists of two sub-regions Tara - Drina (Montenegro, Bosnia and Herzegovina, and Serbia) and Drina - Sava (Bosnia and Herzegovina, Serbia, and Croatia). The NALAS region covers the Adriatic Sea coastal area while the Sharra and Tara-Drina-Sava represent SWG regions.

The project partner network includes Local Government Associations (LGAs) - members of NALAS from 4 countries: Albanian Association of Municipalities; Union of Municipalities of Montenegro; Association of Municipalities and Cities of the Federation of Bosnia and Herzegovina, and Association of Municipalities of the Republic of Croatia. Other stakeholders are: Ministries of Agriculture and Rural Development; Ministries of Environment; Area Based Development Approach stakeholder groups within the SWG structure (consisted of municipalities, civil society organisations (CSOs) and the private sector)); 41 Municipalities in pilot areas (32 in SWG pilot areas (6 in Sharra region; 26 in Tara - Drina - Sava) and 9 in NALAS coastal area)); other CSOs, private sector, donor agencies, experts, academia, media and general population in the pilot areas.

The major sub-project activities and process flow leading to the achievement of the above mentioned objectives are presented in Figure 1.

Figure 1: Major activities and process flow of SWMRCA sub-project



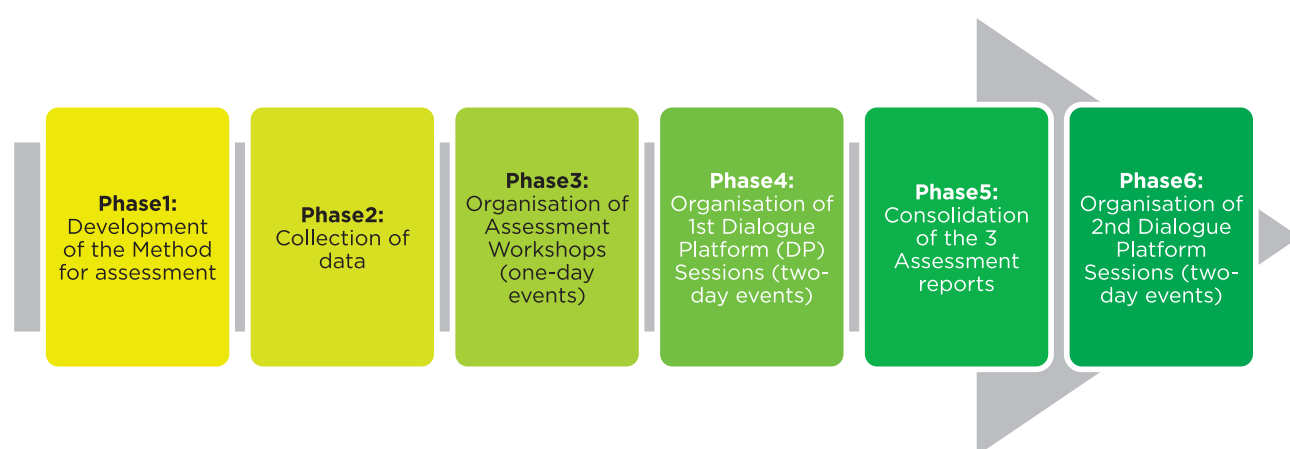
This Process Paper deals with the activities highlighted in light green colour in the Figure 1 which encompass the assessment of the current situation with regard to the cross-border adverse environmental and economic impacts in the pilot regions. The key features of these activities are further described herein.

2. METHODOLOGY

2.1 PROCESS OF ASSESSING THE CROSS BORDER ADVERSE ENVIRONMENTAL AND ECONOMIC IMPACTS

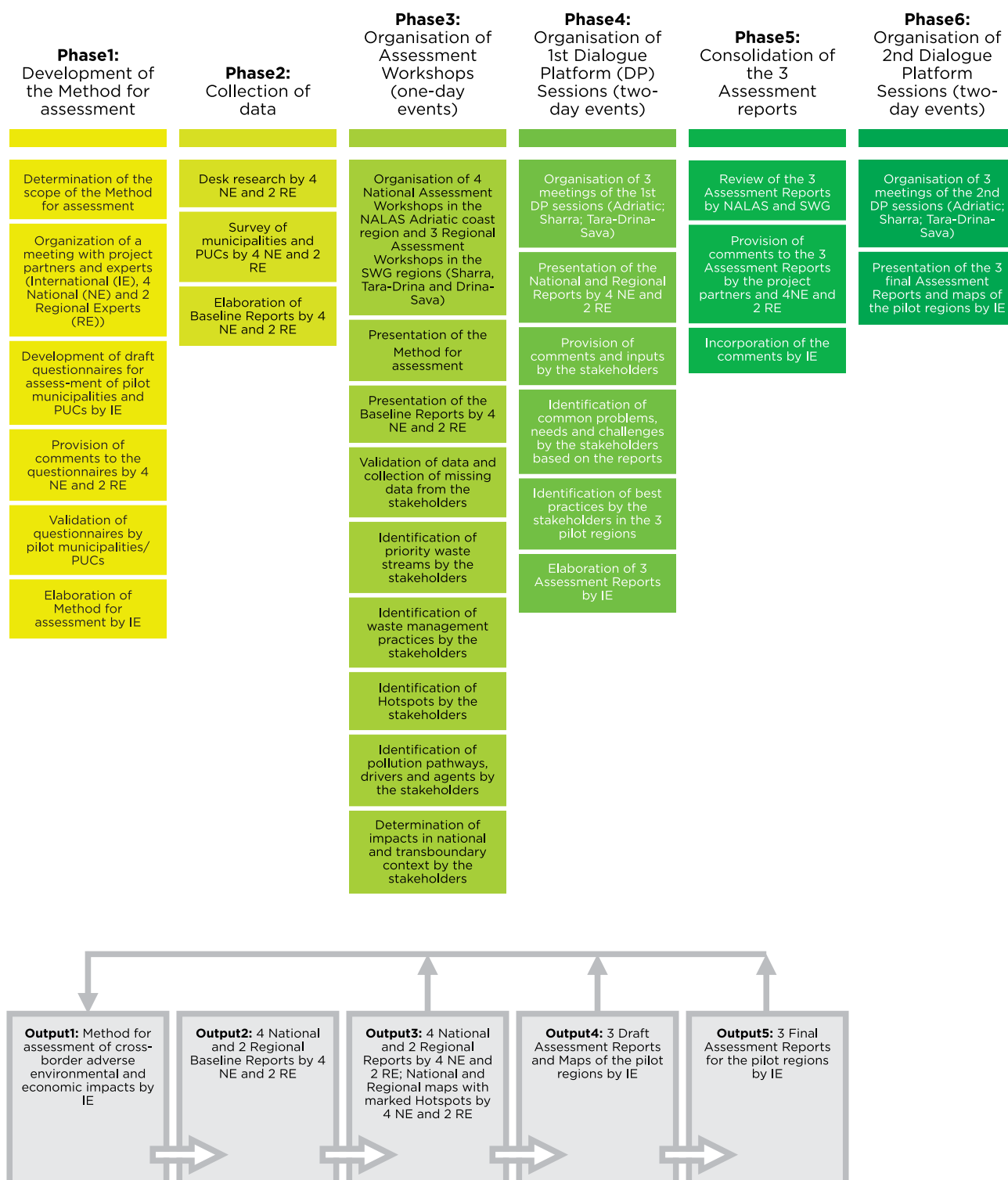
The envisaged models for integrated solid waste management (ISWM) in the pilot rural and coastal regions should effectively address the transboundary adverse environmental and economic impacts deriving from currently applied practices. Therefore, a comprehensive process was designed with the aim to capture relevant and accurate data on these impacts and to elaborate assessment reports as principal inputs in developing ISWM models tailored to the specifics of the three pilot regions. The key phases and the layout of this process are portrayed in Figure 2.

Figure 2: Process of assessing the cross border adverse environmental and economic impacts



A more detailed snapshot of the key phases is displayed in Figure 3.

Figure 3: Assessment of the cross-border adverse environmental and economic impacts in the pilot regions of Adriatic Coast, Sharra Mountain and river catchment of Tara-Drina-Sava

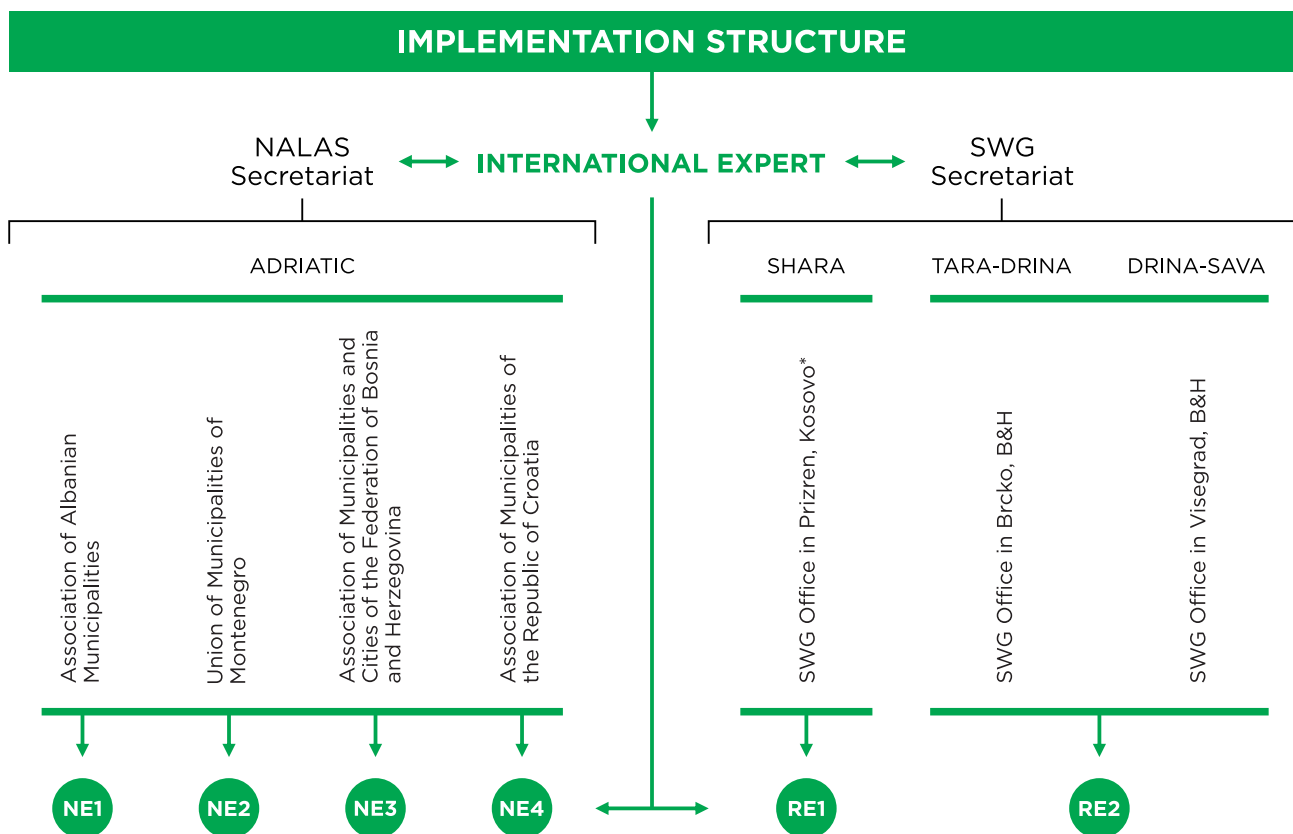


2.2 IMPLEMENTATION STRUCTURE

The implementation of the assessment process implied collection of an immense volume of data originating from various sources in the three pilot regions involving seven countries¹. Similar challenge was posed by the requirement to ensure a participatory involvement of the key stakeholders in the core stages and to thereby establish their ownership of the assessment outputs and commitment for the forthcoming implementation of the ISWM models. This actually entailed bringing together the national- and local-level decision makers, public and private waste management operators, and other stakeholders from these countries and consolidation of their inputs into jointly agreed and applicable solutions.

In response to these requirements, the SWMRCA sub-project has deployed the existing networks of NALAS and SWG, has involved a wide range of other stakeholders, and has appointed seven experts to carry on the assessment process. The graphical presentation of this implementing structure is given in Figure 4.

Figure 4: Implementation structure of the assessment process



Other stakeholders: Ministries of Agriculture and Rural Development; Ministries of Environment; Area Based Development Approach Stakeholder Groups in Sharra and Tara-Drina-Sava regions; 41 pilot municipalities/ PUCs; civil society organisations, private sector, donor agencies, experts, academia, media and general population.

1. Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Kosovo*, and Serbia.

2.3 KEY PHASES OF THE ASSESSMENT PROCESS

The assessment process incorporated enabling of a multi-stakeholder and multi-level dialogue as an optimal mode for inclusion of all involved parties and for attaining credible endorsement of the results. The process was characterised by a feedback loop where the outputs of phase 3, 4 and 5 subsequently influenced the output of phase 1 as their basic input.

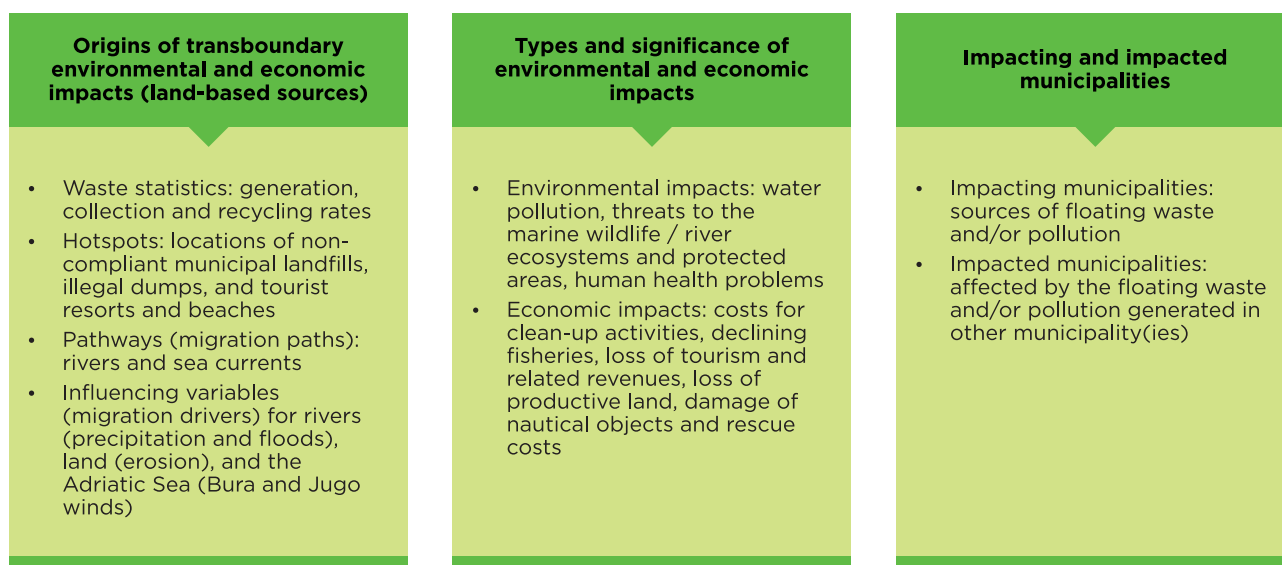
2.3.1 Phase 1: Development of the method for assessment of cross-border adverse environmental and economic impacts

The first phase of the assessment process focused on developing a methodological framework for identification and assessment of the adverse environmental and economic impacts (hereinafter the “method”) and it was led by an International Expert (IE). The main method components included determination of the scope and elaboration of the questionnaires for collecting data from the pilot municipalities and the Public Utility Companies (PUCs).

2.3.1.1 Scope of the Method of Environmental and Economic Impact Assessment

The scope of the method encompassed identification of core impact factors and consequences which are grouped into three categories as presented in Figure 5.

Figure 5: Scope of the Method of Environmental and Economic Impact Assessment

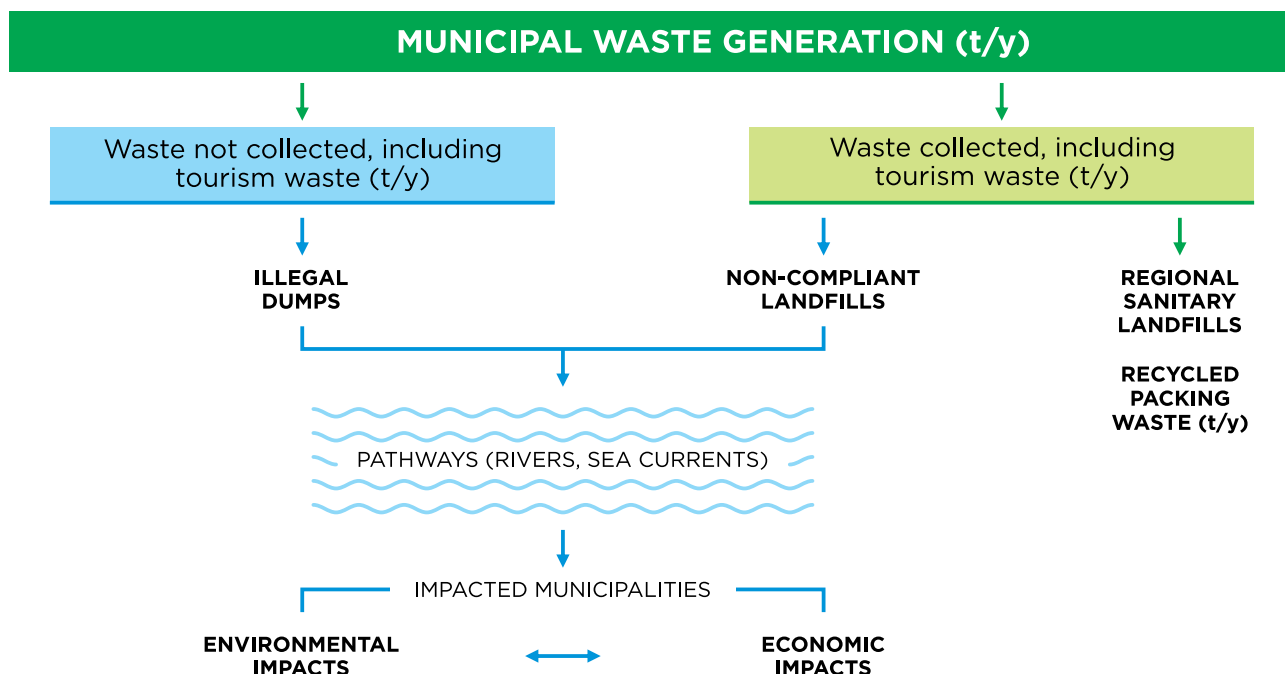


The underlying logic behind the assessment scope is that the majority of floating waste and/or pollution originates from land based sources i.e. from non-compliant landfills and illegal dumps formed by the misplaced or non-collected municipal waste. From these hotspots, the migration drivers trigger uncontrolled cross-border dispersion of light fractions (mainly plastic waste) via rivers or the sea. The magnitude of the pollution is determined proportionally to the amount of mismanaged waste. This waste is determined as total waste generated (calculated as a product of the population number and the indicator of annual waste production in kilograms per capita) reduced by the amount of waste collected and properly disposed, and the recycled waste. It is estimated that approximately 30% of the mismanaged waste end up in rivers/sea and become floating waste carried further by the currents. The locations of the hotspots and the pathways determine the status of the pilot municipalities as sources and/or recipients of waste/pollution. The

polluted areas are further analysed to identify the types and significance of the adverse effects and to quantify the damage caused.

A graphical depiction of the origins and pathways of the floating waste and/or pollution, and the position of the impacting and the impacted municipalities is given in Figure 6.

Figure 6: Origins and pathways of the floating waste and/or pollution, and position of the municipalities²



2.3.1.2 Elaboration of the survey questionnaires

A kick-off meeting of the project partners and the experts (IE, 4 National (NE) and 2 Regional Experts (RE)), was organised to discuss the survey questionnaire concept along with other core topics such as common understanding of the assessment process, definition of roles of all involved actors, and organisation of the Assessment Workshops. The draft questionnaire was elaborated by the IE and was further upgraded by incorporating the comments of the NE and RE. The revised questionnaire was validated by integrating the feedback of the municipalities and the PUCs.

The survey questionnaire for municipalities covered the topics of policy and legislation; local regulations; economic issues (e.g. cost recovery, service coverage, recycling and annual income from tourism); waste generation and composition (population, economic activities, waste generation per capita, share of recyclables and non-recyclables, etc.); and environmental hotspots. An impacts` level and significance matrix was used as well to assess initially the significance of the environmental impacts. The questionnaire for the PUCs dealt with the issues of waste collection operations and equipment, waste treatment (segregation, recycling, etc.) and protection and location of the landfills.

2.3.2 Phase 2: Data collection and data validation process

The data collection process consisted of desk research of a wide range of documents including

² The figure represents a simplified overview of the actual process. Its interpretation should take into account the notion that approximately 30% of the mismanaged waste become floating waste.

Local Environmental Action Plans (LEAPs) and strategies, and a survey of the pilot municipalities and the PUCs for which tailored questionnaires were constructed. It should be noted that, within the project context, the pilot municipalities actually constituted the pilot regions. The collection process was conducted in parallel by the 4 NE and 2 RE and included among others activities such as e-mail correspondence, exchange with the stakeholders at the assessment workshops, project events, and visits to the pilot municipalities.

Further research activities were conducted to capture other relevant information. These included among others research of the magnitude of the mismanaged waste and its ultimate destinations (e.g. mapping of the illegal dumpsites, and analysis of the sea currents and river flows), and the extent of the adverse impacts (e.g. analysis of the negative feedback from tourist as an indicator of the lost tourist visits and the resulting economic losses).

The data gathered were processed and integrated in the Baseline Report which was produced in six separate versions: four national reports which referred to the four countries within NALAS Adriatic region, and two regional reports which targeted the SWG Sharra and Tara-Drina-Sava regions.

The validation process was conducted through presenting and discussing the data gathered with the project stakeholders at the assessment workshops and the 1st Dialogue Platform sessions.

2.3.3 Phase 3: Organisation of Assessment Workshops (one-day events)

4 National Assessment Workshops in the NALAS Adriatic coast region and 3 Regional Assessment Workshops in the SWG regions (Sharra, Tara-Drina and Drina-Sava) were organised with the aim to validate the data gathered and to collect the outstanding data.

For that purpose, the corresponding Baseline Report was presented in each pilot region and discussed in a multi-stakeholder environment. The presented data were reviewed and complementing inputs were solicited. The data were validated by the representatives of the Local Self-government Units (LGUs), PUCs, private waste management and recycling operators and, in some instances, ministries, CSOs and hydro-power plants.

The 4 National and the 3 Regional Assessment Workshops rendered an opportunity for focus groups work and plenary discussion of other important topics such as identification of priority waste streams, waste management practices, environmental hotspots, pollution pathways, drivers and agents, and preliminary impact assessment of environmental hotspots. This exchange has provided essential contributions to the Baseline Reports as preliminary input documents to the 3 Impact Assessment Reports.

The 7 assessment workshops were attended by a total of 199 participants (thereof app. 60% from public institutions / organisations) representing the key parties involved in solid waste management and other stakeholders such as CSOs, companies and media concerned with the current SWM practices.

2.3.4 Phase 4: Organisation of 1st Dialogue Platform (DP) Sessions (two-day events)

A two-day session of the 1st Dialogue Platform was held in each pilot region: the NALAS Adriatic Coast region, the SWG Sharra region, and the SWG Tara-Drina-Sava region. Each of these platforms brought together several countries and municipalities - involved in a joint cycle of generating and/or receiving adverse environmental impacts - with the aim to share experiences, search for common

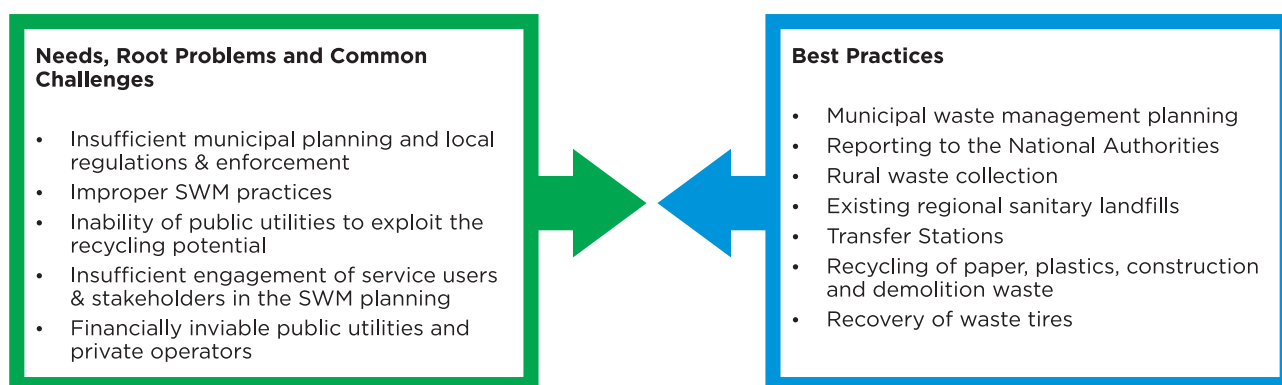
solutions and discuss the ways for future cooperation in installing proper ISWM. In total, 108 participants (57% representing public institutions / organisations, thereof 7 persons delegated from national ministries) took part in the sessions.

The Draft Assessment Reports, which incorporated the outcomes of the Baseline Reports and the further research conducted after the Assessment Workshops, was presented in the introductory part of each session. This was followed by plenary discussions of the stakeholders who have commented / validated the presented findings and have contributed further inputs to the content of the reports.

Two focus groups were organised to elicit empirical data, estimates and proposals on the key factors shaping the ISWM practices. The first focus group discussed the issues of needs, root problems and common challenges to determine the relevance of the identified critical issues in each municipality and to formulate proposals for addressing them. Furthermore, the participants were prompted to list other issues that have not been identified so far in the Assessment Reports. The second focus group worked on figuring out the best practices, their relevance in each municipality, the resources available for their implementation, and the ways for replication in the region.

The topics discussed in the focus groups are listed in Figure 7.

Figure 7: Focus group topics related to needs, root problems and common challenges, and best practices



The presentation of the focus groups' results was followed by discussions to clarify other aspects such as similarities/differences among pilot municipalities, issues of common interest and basis for possible transboundary cooperation of the impacting and impacted municipalities.

2.3.5 Phase 5: Consolidation of the 3 Assessment Reports

Based on the outcomes of the 1st Dialogue Platform sessions, upgraded versions of the Assessment Reports for the three pilot regions were elaborated by the International Expert. These reports were further reviewed by NALAS, SWG, and the National and Regional Experts. The feedback was collected and incorporated in the final versions of the Assessment Reports.

2.3.6 Phase 6: Organisation of 2nd Dialogue Platform Sessions (two-day events)

Each pilot region hosted a two-day session of the 2nd Dialogue Platform to enable stakeholders' consultation on initial findings and proposals of the ISWM model for that particular region. The opportunity was used to present the final versions of the Assessment Reports and in particular the extent of the adverse impacts in monetary terms, in plenary meetings of stakeholders from all levels.

It should be noted that Phase 6 did not bring a documentary output related to the Assessment Reports on its own.

The 2nd Dialogue Platform sessions were attended by 103 participants, representing local and national governments (thereof 3 representatives of national ministries), public and private waste management operators, CSOs, companies and media.

3. KEY MESSAGES

The assessment process has derived the following key messages:

Key message 1: The capacities of pilot municipalities in waste collecting, proper disposition and recycling are underdeveloped.

An enormous number of pilot municipalities (33 or 80%) collect less than 90% of the generated waste. The outstanding waste quantities are illegally dumped, very often in flood / tide prone areas. Most of the municipalities (25 or 61%) dispose the collected waste in non-compliant landfills, which further amplifies the risk of generating floating waste / pollution. The recycling operations are extremely scarce and the recycling rates are close to negligible. The root causes of this situation are manifold and include insufficient municipal SWM planning, local regulations and enforcement; improper SWM practices which contribute to illegal dumping and littering; inability of public utilities to exploit the recycling to its full potential; insufficient engagement of service users and other stakeholders in the SWM planning; and financially inviable public utilities and private operators working under service contracts.

Key message 2: The impacts of solid waste mismanagement extend beyond the municipal and national borders.

The pilot municipalities most frequently act either as impacting municipalities which are responsible for the generation of floating waste and / or pollution or impacted municipalities which receive this waste and / or pollution. In a number of cases, the municipalities are both impacting and receiving impacts from areas outside their borders. Due to the inadequate waste management practices and particularly the illegal dumping, 35 pilot municipalities (85%) are responsible for the generation of floating waste and / or pollution which can affect other municipalities. The exact number of impacted municipalities can only be determined in a limited number of cases. An obvious example in this regard is the Adriatic Coast region due to the well known sea currents which determine the waste floating paths. In a strict sense of the term, only 10 municipalities can be considered as receivers of the floating waste and / or pollution (thereof, 8 municipalities receive waste generated abroad). However, the actual number of impacted municipalities is much higher owing to the water streams which further carry the waste into larger rivers such as Vardar, Sava and Danube. Besides the impacted municipalities, five hydro-power plants have been identified as receivers of floating waste, three of them being affected by waste originating in other countries.

Key message 3: The transboundary adverse impacts can only be solved by an integrated multi-stakeholder and multi-level transboundary approach.

The ultimate effects of solid waste mismanagement are frequently felt in distant areas within the borders of other municipalities and countries. Thus, any sensible and sustainable solution has to bring together the key stakeholders from both the initial and the ending point of the pollution process, and to harmonise their plans and actions. This collaborative approach brings a range of synergy effects such as transfer of best practices, bundling of resources, and cost efficiencies. The areas of deficiencies and the magnitude of the resulting pollution require systemic changes with multi-level actions and involvement of policy makers and decision takers on national, regional and local level, public and private organisations, and citizens.

4. KEY FINDINGS

Key finding 1: SWM practices and pollution potential in the pilot regions.

The assessment reports provided a comprehensive insight into the current SWM practices in the pilot regions. Estimates of the pollution potential i.e. the magnitude of released waste which exerts adverse impacts were made as well. The key information gathered includes:

- **Origins of floating waste / pollution:** the total annual waste generation in tons was figured out for each pilot municipality and region, and the relative contribution of each municipality and country in the overall waste generation was determined. The amounts per region are:

TOTAL WASTE GENERATION		
Adriatic Coast: 204,545 tons/year	Sharra region: 91,879 tons/year	Tara-Drina Sava region: 322,319 tons/year

- **Waste Collection Rate** was defined for each pilot municipality and region. The waste collection rate varies considerably across municipalities and regions. The lowest municipal collection rate within each region amounts to 70% in Adriatic Coast region, 50% in Sharra region, and 23% in Tara-Drina-Sava region.
- **Quantity of waste not collected** was calculated for each pilot municipality and region. The quantities per region are as follows:

WASTE NOT COLLECTED		
Adriatic Coast: 31,131 tons/year	Sharra region: 19,345 tons/year	Tara-Drina Sava region: 99,363 tons/year

- **Floating waste:** the quantity of released waste that is further distributed by rivers and sea currents was determined based on the estimate that approximately 30% of the non-collected waste become floating waste:

FLOATING WASTE		
Adriatic Coast: 12,449 tons/year	Sharra region: 5,803 tons/year	Tara-Drina Sava region: 29,235 tons/year

Key finding 2: Extent of the cross-border adverse environmental and economic impacts in the pilot regions.

- **Environmental impacts:** the assessment revealed that the floating waste / pollution cause considerable deterioration of the health and productivity of marine, lake and riverine ecosystems. The most endangered species of wild fauna and flora have been identified and the available data on the destruction extent have been collected.
- **Economic impacts:** the analysis included the following types of economic impacts:
 - Costs for cleaning illegal dumps – origins of floating waste (prevention activities);

- Costs for cleaning stranded litter at the coasts / river banks;
- Lost revenues from tourism due to aesthetic disturbance caused by litter, floating and stranded waste;
- Costs for cleaning floating debris from the reservoirs of hydro-power plants (HPP) and
- Lost revenue from power generation.

The actual impacts analysed differed according to the specifics of and data availability for each pilot region. The amount of costs and losses per pilot region is displayed below:

Figure 8: Extent of adverse economic impacts in monetary terms

TYPE OF COST / LOST	TOTAL ANNUAL COSTS & LOSSES IN EURO		
	Adriatic Coast	Sharra region	Tara-Drina-Sava region
Costs for cleaning illegal dumps	1,556,550	529,000	4,968,150
Costs for cleaning beaches	2,018,280	/	/
Lost tourism revenues	34,450,365	n / a	1,488,083
Costs for cleaning floating debris from the HPP reservoirs	/	/	400,000
Lost revenues from power generation	/	73,886	1,700,000
TOTAL	38,025,195	602,886	8,556,233

Considering that the total investments needed to purchase equipment for collecting the waste from settlements which are currently not covered by the organised service are in an amount of 7,888,200 Euro for the Adriatic Coast region, 2,715,000 Euro for the Sharra region, and 13,860,000 Euro for the Tara-Drina-Sava region, it is clear that the investment would pay off in a relatively short time period³. Under the most conservative scenario where the investment would only prevent the formation of illegal dumps and consequently the related cleaning costs, the payback periods would be 5,1 years for the Adriatic Coast and Sharra regions, and merely 2,7 years for Tara-Drina-Sava region. The payback periods for all pilot regions would be further shortened under the assumption that the other cleaning costs are prevented as well as that the economic losses are successfully converted into gains.

3. This estimate represents a rough approximation since it does not take into account the operation costs of the extended collection services.

5. CHALLENGES

The assessment process revealed multiple challenges which are presented in Figure 9.

Figure 9: Major challenges with solid waste management in the 3 pilot regions



The ways of addressing these challenges will be dealt with in the Process Paper no. 2 on ISWM models, and in the Process Paper no. 3 on pilot measures and policy recommendations.

Supported by:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Open Regional Fund for South East Europe - Modernisation of Municipal Services (ORF MMS)

Published by:
Open Regional Fund for South East Europe – Modernisation of Municipal Services (ORF MMS)

Contact person:
Christophe di Marco, Sector Fund Manager
T: +387 33 957 541
E: christophe.dimarco@giz.de

GIZ Regional Office Sarajevo
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Zmaja od Bosne 7-7a
Importanne Centar 03/IV
71000 Sarajevo / Bosnia and Herzegovina
T: +387 33 957 500
F: +387 33 957 501
I: www.giz.de/regional-funds-southeasteurope