Regional Climate Partnership
GERMANY – WESTERN BALKANS

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

RCDN Regional Capacity Development Network for Water and Sanitation Services

Powered by RCC.int

CLEAN FLOW WB6

From Wastewater Practice to Policy

REGIONAL ADVOCACY PAPER ON

Sustainable Wastewater Services

Practitioner evidence and proposed directions for regional dialogue

Regional Advocacy Paper on Sustainable Wastewater Services

Practitioner evidence and proposed directions for regional dialogue

Prepared through	CLEAN FLOW WB6
Basis	Wastewater practitioner experience, Six Communities of Practice (CoPs) and associations of water and wastewater utilities across the Western Balkans Six (WB6): SHUKALB, UPKP, AWRS, SHUKOS, ADKOM, AWM and UTVSI.
Supported by	Regional Capacity Development Network for Water and Sanitation Services in Southeast Europe (RCDN+)
Status	Prepared for CLEAN FLOW WB6 stakeholder dialogue *17-18 November 2026 | Budva, Montenegro*

THE MAIN MESSAGE

Wastewater infrastructure delivers its intended environmental and public value only when the service can be financed, operated, staffed and maintained throughout the life of the investment.

This paper brings forward three priorities identified through the Communities of Practice (CoPs) across the Western Balkans Six (WB6): sustainable financing, sludge management and human capital. It invites the institutions and organisations participating in CLEAN FLOW WB6 to examine these priorities, consider what needs to improve within their respective responsibilities, and identify opportunities for continued action at domestic and regional levels.

Three priorities for discussion

Priority	What needs to change	Practical test
1. FINANCIAL SUSTAINABILITY	Finance the wastewater service, not only construction.	Can the plant pay its operating bills, maintain critical equipment and fund renewal - and who addresses any gap?
2. SLUDGE MANAGEMENT	Treat sludge management as part of the wastewater service.	Is there a lawful, technically workable and financed route for sludge beyond the plant gate?
3. HUMAN CAPITAL	Make workforce readiness part of wastewater investment and management.	Are competent people and backups available for critical functions, now and over the asset's life?

At CLEAN FLOW, participants are invited to consider these priorities against their own experience and identify what could realistically be taken forward at domestic and regional levels.

1. WHY THIS MATTERS NOW

Wastewater services are entering a demanding phase. New infrastructure is being prepared and built, existing plants face increasingly demanding environmental requirements, and utilities are asked to provide reliable services under financial, institutional and human-resource constraints. The central concern coming from practitioners is simple: infrastructure alone does not guarantee sustainable wastewater treatment.

CLEAN FLOW WB6 – From Wastewater Practice to Policy starts from the operational reality of wastewater treatment plants (WWTPs). Through CoPs and utility associations, practitioners have identified recurring issues that cannot be resolved by better day-to-day plant management alone. Some require decisions on financing, sludge outlets, staffing, regulatory practice and institutional responsibilities.

European Union (EU) integration and the EU environmental acquis, including the recast Urban Wastewater Treatment Directive (EU) 2024/3019, increase the importance of implementation capacity. The Revised Action Plan for the Green Agenda for the Western Balkans (GAWB) (2025–2030), particularly the Depollution Roadmap and water-related Actions 26a and 26b, offers a timely context for dialogue on water-acquis alignment and wastewater depollution. The three themes are enabling conditions for that implementation; this paper does not claim that the Action Plan itself prescribes all measures proposed here.

Reliable wastewater services also support wider water resilience: reducing pollution pressures on receiving waters, protecting ecosystems and improving the durability of public investments. This connection is particularly relevant for institutions working across environmental protection, water management, investment and regional cooperation. Wastewater management, as highlighted in the WB6 Climate Adaptation Strategy[1], is of high importance with multiple co-benefits (water security, environmental protection, resilience to climate change).

It calls on the WB6 to support climate-proofing of wastewater collection and treatment infrastructure, in line with the Urban Wastewater Treatment (UWWT) Directive, strengthen capacities and run training on sustainable wastewater management.

2. WHAT WE ARE HEARING FROM WASTEWATER PRACTITIONERS

The six domestic-level contributions and the three regional papers point to related problems, although the evidence differs in scope, year and detail. They allow us to identify recurring challenges, but not to rank WB6 or draw uniform conclusions about every plant.

a) Financial sustainability

Construction grants and loans do not automatically fund electricity, staff, chemicals, maintenance, sludge handling or future replacement. The contribution from Serbia draws on at least three WWTPs, including Kragujevac, and describes pressures on major repairs and renewal. North Macedonia's WWTP Prilep illustrates that biogas cogeneration can reduce electricity demand – approximately 22% in 2025 according to the domestic contribution – without eliminating the need for lifecycle financing. The Skopje project illustrates why operating and staffing arrangements should be settled before commissioning; it does not establish a quantified future gap.

b) Sludge management

Treatment does not end when wastewater leaves the plant. The sludge paper describes missing permitted outlets, accumulating sludge and costly emergency arrangements. Its examples include constrained sludge removal at Budva, accumulating sludge at Berovo and Kočani, and expensive export from Mostar. These examples show why a functioning sludge-treatment line is not sufficient without a lawful destination, institutional responsibility and financing for the entire chain.

c) Human capital

The human capital paper highlights the need for competent staff on every shift, practical onboarding, backups, succession planning and retention. A plant in North Macedonia example reports 21 of 22 WWTP employees aged 45 or above; this supports succession planning but does not by itself establish imminent retirement. Staffing constraints are context-specific and cannot be solved by training alone.

The three issues are closely connected. Decisions on construction, operating finance, sludge management and staffing cannot be treated separately if wastewater investments are to deliver lasting results. Operators can improve day-to-day performance, but many of the constraints require decisions by owners, authorities and financing partners.

[1] RCC — WB6 Climate Adaptation Strategy 2026–2030 ; RCC — WB6 Climate Adaptation Roadmap (2025)

The examples presented in this section are drawn from the three CLEAN FLOW WB6 Regional Findings and Advocacy Papers on Financial Sustainability, Sludge Management and Human Capital (November 2026). These papers provide the underlying domestic contributions, supporting evidence and relevant qualifications. Figures refer to the specific facilities and periods reported and should not be interpreted as representative of all WWTPs in the WB6.

3. PRIORITIES FOR POLICY DIALOGUE

Priority 1 – Finance the wastewater service, not only the infrastructure

Building WWTP is only the beginning. Sustainable financing must cover its operation, maintenance and future replacement, not only construction.

We propose that major new and upgraded WWTP investments include a jointly prepared, costed multi-year lifecycle financing plan, reviewed before commissioning and linked to the utility business plan and tariff cycle. The plan should make clear who operates and owns the assets, what operation, maintenance and replacement will cost, what revenues are expected and who will address any shortfall. Existing plants also need a practical assessment of urgent maintenance and renewal gaps.

Cost recovery should distinguish paying current operating bills from funding major repairs and eventual asset replacement. Transparent service-level costs, collection performance, efficiency and affordability should inform domestic tariff and public-financing decisions. Where justified public support is needed, its funding source and predictability should be made clearer; support to utilities for service delivery is different from protection for households facing unaffordable bills.

For discussion: public owners and competent authorities can examine funding responsibilities; regulators can contribute on tariff methodologies and implementation; utilities and operators can check the assumptions behind operating and renewal costs; financing partners can consider the long-term viability of investments.

Priority 2 – Treat sludge management as part of the wastewater service

No WWTP is complete without a secured sludge route.

We propose that sludge management be planned as part of the wastewater service, not as a separate problem to be dealt with after commissioning. Existing plants need workable routes for sludge, including interim arrangements where necessary. New investments should identify lawful, feasible and financed options for treatment, recovery or disposal, with responsibilities clearly assigned.

Sludge costs should be visible in utility planning and appropriate domestic financing mechanisms. Comparable, clearly defined data on sludge quantities and quality can help identify realistic options. A minimum WB6 dataset could be tested voluntarily by interested CoPs; it would not replace domestic legal reporting or presume a single regional technical solution.

Beyond its contribution to depollution objectives, sustainable sludge management also offers opportunities to support the transition towards a circular economy through resource recovery, including nutrients, organic matter and renewable energy. The findings from the WB6 highlight that these opportunities remain largely underutilised due to regulatory, technical, financial and institutional barriers. Addressing these challenges could contribute to broader Circular Economy objectives by supporting the transition from sludge disposal towards safe and economically viable recovery solutions, where appropriate and permitted by domestic legislation. Regional cooperation could facilitate the exchange of practical experience,

identification of common barriers and sharing of approaches to resource recovery, while recognising different domestic conditions and regulatory frameworks.
For discussion: competent authorities can examine standards, permits and responsibilities; utilities can document sludge quantities, quality and costs; public owners and financing partners can consider the full-service chain when preparing investments.

Priority 3 – Make workforce readiness part of investment and management

Money can build infrastructure. Skilled people keep it working.

We propose that major new and upgraded WWTPs have costed workforce plans covering staffing and shifts, recruitment, training, mentoring, handover, backup for critical functions and support after commissioning. Existing plants should also identify the skills and staffing gaps that put reliable operation at risk.
Recruitment and retention responses should be based on verified local barriers, including pay, conditions, career prospects, education supply and recruitment rules. Domestic-level systems differ; a single staffing ratio, certification scheme or employment solution is not proposed. A limited common evidence base and voluntary pilots could help participating institutions test useful approaches.
For discussion: utilities and public owners can identify critical posts and realistic staffing budgets; responsible ministries, education and employment institutions can examine barriers within their mandates; associations and CoPs can support practical learning and exchange.

4. A PRACTICAL CHECK BEFORE AND AFTER INVESTMENT

Before approving or commissioning a major wastewater investment, and when reviewing existing plants, the institutions concerned could consider a few straightforward questions. They may help reveal gaps that otherwise become visible only once a plant is operating.

Question	Evidence to request	Where a decision may be needed
FINANCING	Multi-year operating, maintenance and renewal costs; expected revenue; identified shortfalls	Utility, public owner, regulator, budget authority, financier
SLUDGE	Expected volumes, treatment, permitted outlet, costs and contingency route	Utility, environmental and waste authorities, owner, financier
PEOPLE	Shift coverage, critical competences, recruitment and training plan, backups	Utility, owner, HR and education institutions
ACCOUNTABILITY	Who operates, owns assets, funds gaps and monitors delivery?	Relevant domestic authorities and partners

The questions are intended to support discussion. They are not a proposal for a single approval procedure across the WB6.

5. WHAT DIFFERENT STAKEHOLDERS CAN CONTRIBUTE

Lasting improvements depend on contributions from several institutions. Their roles are different, and any follow-up needs to reflect domestic mandates and responsibilities.

Stakeholders	Contribution to explore
Utilities and WWTP operators	Verify operational evidence, identify critical risks, improve efficiency and bring plant realities into investment and budget decisions.

Public owners and local governments	Address asset ownership, financing gaps, staffing, affordability and operational accountability.
Ministries, regulators and competent authorities	Examine legal, tariff, permitting, employment and policy constraints and feasible domestic improvements.
Associations and CoPs	Consolidate practitioner evidence, support peer learning and connect operational findings with domestic advocacy and dialogue.
EU, IFIs and bilateral partners	Explore how project preparation, investment conditions and technical assistance can address lifecycle sustainability.
RCC and regional partners	Explore suitable connections with existing Green Agenda processes and voluntary regional follow-up, within mandate and subject to agreement.
Civil society	Contribute environmental, transparency, affordability and public-accountability perspectives.

6. WHERE REGIONAL COOPERATION CAN HELP

The WB6 do not need identical tariff, sludge or staffing systems to learn from one another. Regional cooperation can help establish clearer definitions, exchange practical experience and bring credible evidence to the institutions making policy and investment decisions.

The Regional Cooperation Council (RCC) could, where this fits its mandate and priorities, help connect relevant findings to the Green Agenda for the Western Balkans and facilitate further regional discussion. Any use of existing platforms, including the Report on the Implementation of the Green Agenda for the Western Balkans Action Plan (GARI) and the GAWB Observatory, would need to be explored with RCC and the partners concerned; no new role or reporting requirement is assumed here.

The wastewater Communities of Practice and their partner associations have already shown how experience from plants can inform regional discussion. The cooperation developed through RCDN+ offers a useful basis for continued exchange, practical learning and dialogue with decision-makers. Any further cooperation would depend on partner interest and available resources.

Potential regional-level contributions include a small set of carefully defined financial, sludge and workforce indicators; peer exchange on lifecycle planning and investment readiness; voluntary testing of practical tools; and association-led dialogue with responsible domestic institutions and regional partners. The detailed thematic papers provide the basis for further technical work.

7. FROM POLICY DIALOGUE TO PRACTICAL FOLLOW-UP

CLEAN FLOW WB6 brings together wastewater practitioners, public authorities, local governments, regulators, associations, civil society and financing partners to discuss challenges that cannot be addressed by utilities alone.

The three regional advocacy priorities provide a common starting point for this discussion. They are not intended to prescribe identical solutions across the WB6, but to help identify where improvements are needed, who can contribute and where cooperation may bring additional value.

7a) Taking the discussion forward at domestic level

Participating institutions and organisations are invited to consider which of the identified challenges are relevant to their domestic context and what could realistically be improved within their respective responsibilities.

This may include reviewing the financing arrangements of existing or planned wastewater treatment plants, addressing unresolved sludge-management responsibilities, examining

workforce readiness or improving the involvement of operators in investment and policy decisions.
The objective is to identify practical opportunities for improvement, including issues requiring further evidence, institutional consultation or coordination.

7b) Exploring regional cooperation

Some challenges may benefit from continued regional exchange. The Communities of Practice and their partner associations can contribute by sharing operational experience, identifying recurring implementation barriers and bringing practitioner evidence into dialogue with decision-makers.
Regional cooperation could focus on selected issues where there is a clear common interest, such as comparable operational evidence, practical approaches to lifecycle financing, sludge-management information, workforce development and peer learning.
Where appropriate, relevant findings could also inform ongoing dialogue under the Green Agenda for the Western Balkans and its implementation processes. The possible contribution of RCC and other regional partners would be explored in consultation with the institutions concerned and in line with their respective mandates.

7c) An invitation to act

CLEAN FLOW participants are invited to use the Dialogue Labs and discussions to:

- Identify the findings and priorities that are sufficiently supported by practitioner evidence and relevant across different domestic contexts;
- Consider which improvements could be pursued by their institutions or through cooperation with other stakeholders;
- Explore opportunities for domestic and regional follow-up, including the contribution of existing networks, associations and regional mechanisms;
- Identify interested partners and possible next steps, recognising that any further action would require consultation and agreement by the institutions concerned.

The intention is to move beyond identifying problems towards a clearer understanding of what can be improved, who can contribute and how the dialogue initiated through CLEAN FLOW could be continued.

8. A PRACTICAL INVITATION TO PARTICIPANTS

Participants are invited to identify what they can contribute within their own mandates: review a financing assumption, examine a sludge-management barrier, assess workforce readiness, share plant-level evidence or connect interested partners. Not every institution needs to act on every issue. The aim is to identify useful next steps and the right partners for them.

The discussion should distinguish possible domestic measures from areas where regional cooperation adds value. Associations and Communities of Practice could help consolidate further evidence and maintain contact with practitioners. Where appropriate and of interest to the institutions concerned, findings could be brought into the existing GAWB-related dialogue and regional exchanges. Any follow-up, including a facilitating role for RCC, would require further consultation and agreement with the relevant partners.

9. CLOSING MESSAGE

Sustainable wastewater services require more than infrastructure. They depend on financing that covers long-term needs, workable sludge-management arrangements and competent people who can operate and maintain the systems.

The evidence brought forward by wastewater practitioners provides a basis for addressing these challenges. The next step is to connect this evidence with the institutions and decisions that can make a difference.

CLEAN FLOW WB6 offers an opportunity to build a common understanding of the priorities, identify practical directions for improvement and explore how stakeholders can contribute, individually and through cooperation, to more sustainable wastewater services across the WB6.

This paper is a regional advocacy synthesis for dialogue and may be refined to reflect the discussion; it is not a jointly endorsed declaration.

10. SOURCES AND BASIS OF THE PAPER

Prepared from the September 2026 draft Regional Advocacy Paper on Sustainable Wastewater Services (Zoran Bogdanovski), the three CLEAN FLOW WB6 regional findings and advocacy papers on Financial Sustainability (Ivan Bogdanovic), Sludge Management (Ahmed Busuladzic) and Human Capital (Lejla Alagić), and the established CLEAN FLOW concept and session framing. Detailed plant-level figures, sources, domestic differences and evidence caveats remain in the thematic papers.

Furthermore, it is important to mention the Associations of water and wastewater utilities across the WB6 that contributed to this paper:

- The Association of Employers of Utility Companies in the Federation of Bosnia and Herzegovina (UPKP);
- The Association of Waterworks of Republika Srpska (AWRS);
- The Water Supply and Sewerage Association of Albania (SHUKALB);
- The Water Supply and Wastewater Works Association of Kosovo* (SHUKOS);
- The Association of Communal Service Providers in North Macedonia (ADKOM);
- The Association for Water Technology and Sanitary Engineering (UTVSI) from Serbia and
- The Association of Waterworks of Montenegro (AWM)

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence