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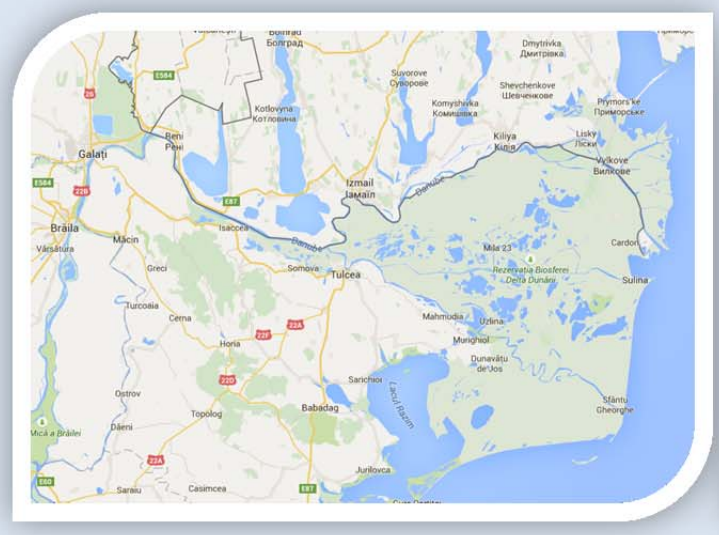
TRACECA IDEA II

Transport Dialogue and Networks Interoperability II

Study on current situation and likely development of the Bystroe canal and Kiliya arm

Final report
January 2016



The study was carried out from July to October 2015. The team, coordinated by Silvia Maffii, comprised Enrico Pastori, Angelo Martino, Viktor Simoncic, Sinisa Spegar, Zoran Lukic and Marco Brambilla.

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LIST OF ABBREVIATIONS

ACN	Administration of the Navigable Canals
AFDJ	Administration of Lower Danube in Galati
AHP	Analytical Hierarchy Process
DBR	Danube Biosphere Reserve
CBA	Cost Benefit Analysis
DWNR	Deep Water Navigation Route
DWT	Dead Weight Tons
EaP	Eastern Partnership
EC	European Commission
ECCG	Ecological Consulting Centre Galati
EIA	Environmental Impact Assessment
EU	European Union
GIS	Geographic Information System
HP	Horse Power
ICC	Interagency Coordinating Council on the implementation of the Espoo Convention in Ukraine
ICPDR	International Commission for the Protection of the Danube River
LBD	Length Breadth Depth
MoFA	Ministry of Foreign Affairs
MoT	Ministry of Transport
NGO	Non-Governmental Organisation
TEN-T	Trans-European Networks – Transport
UAH	Ukrainian Hryvnia
UNECE	United Nations Economic Commission for Europe
USRIEP	Ukrainian Scientific Research Institute of Ecological Problems
VAT	Value Added Tax
WWF	World Wildlife Fund for Nature

1 INTRODUCTION

1.1 BACKGROUND

For several years the European Commission has promoted inland navigation as a way of mitigating the impacts of surface transport activities as part of an integrated transport system based on co-modality. The Danube plays an important role in this strategy, being one of the most important rivers of the pan-European navigation network and, as such, it is part of the Rhine-Danube Core corridor of the TEN-T network (EC, 2014).

The Danube flows through ten European countries and reaches the Black Sea via its delta where:

- maritime navigation is conducted by seagoing vessels reaching the Danube fairway via navigable canals, where the river section provides the natural necessary water depth for seagoing vessels up to the port of Galati in Romania;
- inland navigation is conducted by barges connecting all the river ports of the lower Danube to Central and Western Europe.

The project under scrutiny is located on the Danube delta and includes the Bystroe canal and the last 170 km of the river, namely in the Kiliya arm. The Kiliya arm is one of the main branches in the final part of the river, which marks the border between Romania and Ukraine (see Figure 1).

The Bystroe canal, which stems from the final section of the Kiliya arm, is located in Ukrainian territory. It has already been in use in the last century as a navigable way.

The canal has been a topic of discussion between Romania and Ukraine since digging works started in 2004. To Ukraine, the Bystroe canal is strategically relevant as it connects the Black Sea to the EU inland waterway core transport network. More specifically it is the fastest route by which to access the Danube domestic ports of Izmail and Kiliya.

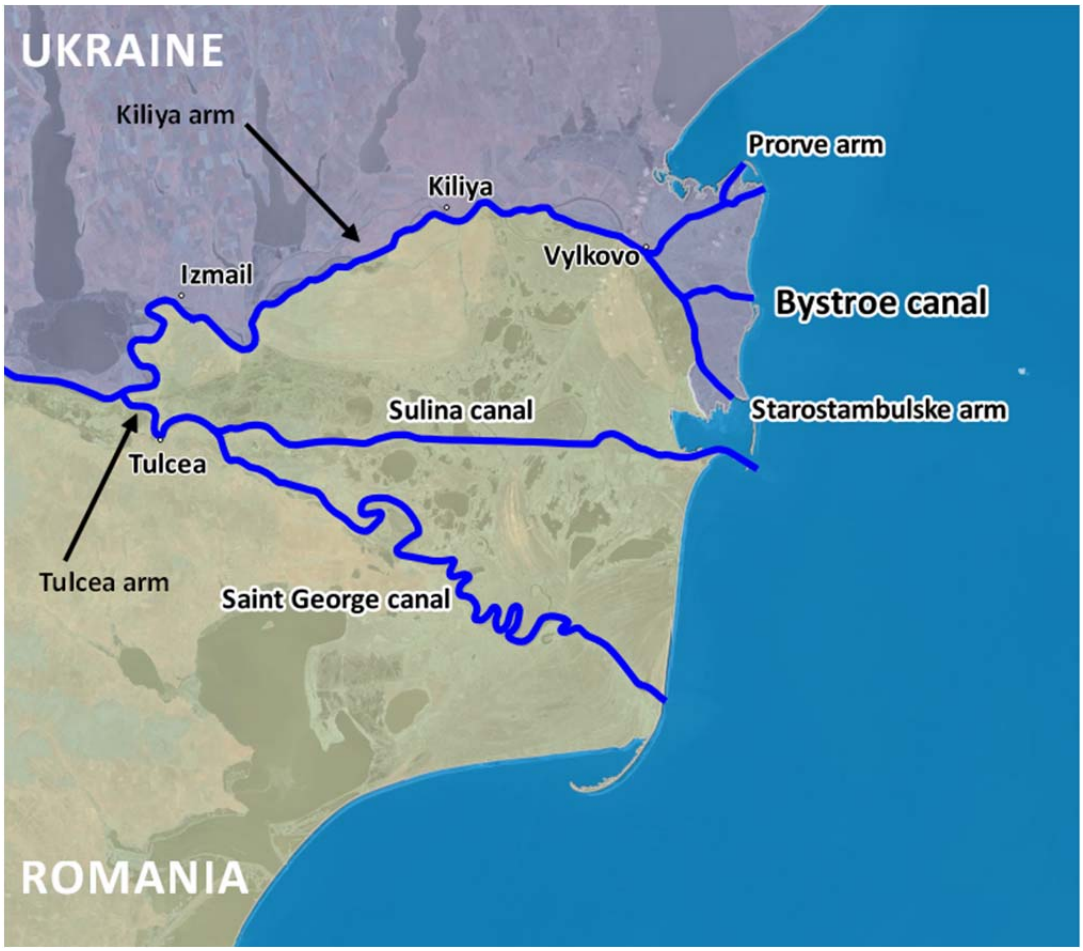
Since the works on the Bystroe canal began in 2004, the Romanian authorities have claimed that the environmental impact of construction and maintenance of the canal would significantly affect the whole delta region with transboundary effect. Romania has remarked that there would be a replication of what happened when works carried out to dig, straighten and maintain the Sulina canal on the Romanian side of the Danube delta were carried out (more than a hundred years ago).

Although the divergent views of Romania and Ukraine have always concentrated on the environmental impacts, there is another factor that needs careful consideration. Analysis of navigational data in the Danube delta region over the last 10 years has proved that the Ukrainian Bystroe canal attracted a significant percentage of small ships that docked at the

region's ports, thus having an impact on both traffic and on the revenues generated by the Romanian Sulina canal (impact low because of the tonnage of ships).

Despite the many attempts made over the years to reconcile the two countries, the issue remains unresolved with implications that have reverberated over the failure to reach an agreement regarding the definition of the strategic inland waterway transport network of the Eastern Partnership Region.

Figure 1 – The Kiliya arm and the canals in the Danube delta region



Source: TRT elaboration

1.2 THE STUDY

The Bystroe canal and Kiliya arm study (to be known as the "study" henceforth) offers an independent assessment of the situation paying particular attention to the environmental impact of the project. The objectives of the study were

- to provide a clear and unbiased analysis of the current situation and its possible development and
- to enable the Commission services to make an informed policy decision in this matter.

The study was conducted by combining contributions from two sources:

- Review of available studies and documentation, including
  - Project documentation made available by Ukrainian institutions, including the environmental impact assessment;
  - Reports and studies from various stakeholders/parties e.g. national administrations, bi-lateral committees, NGOs, industry, operators, etc.;
  - Current and future environmental legislative regulations, with a view to the obligations stemming from the EU-Ukraine association agreement;
  - Traffic data and service characteristics on the canal as well as on the whole Danube delta region.
- Meetings with the interested parties including representatives of the Romanian and Ukrainian ministries and governmental agencies in the transport and environment sectors, local NGOs (Romania and Ukraine), international NGOs, Danube international organizations, etc.

The report is organised as follows. Section 2 describes the history of Phase I and II of the Bystroe canal project, Section 3 provides an overview of the environmental implications of Phase I and provides a synopsis of Romania and Ukraine's diverging of views. Section 4 focuses on the current status of maritime navigation in the Danube delta. Finally, Section 5 presents the study's conclusions and recommendations.

The document is supplemented by two annexes: (i) summary of the meetings with Ukrainian and Romanian national authorities and international organizations and (ii) list of the main documents analysed for the study.

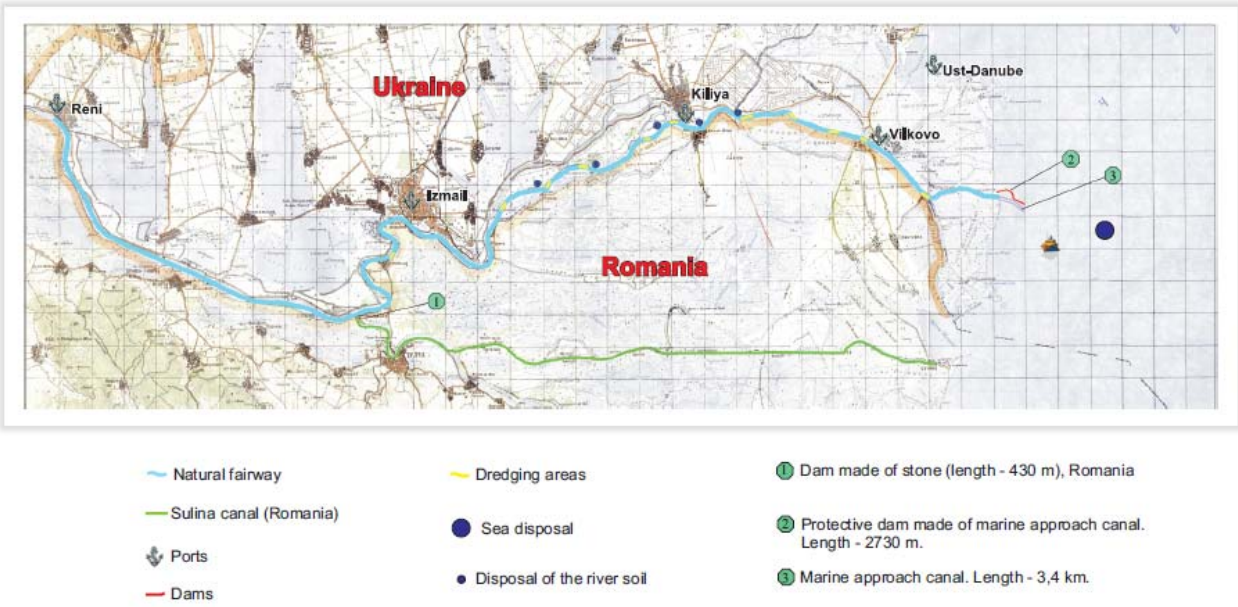
2 HISTORY OF THE BYSTROE CANAL PROJECT

2.1 THE KILIYA ARM AND THE BYSTROE CANAL

The Kiliya arm is one of the natural branches of the Danube delta that connects the Ukrainian river ports of Izmail and Kiliya to the Black Sea (see Figure 2). It has been used regularly for navigation in the last century, as part of the so called "golden triangle", to transport goods from overseas to inland areas and vice versa. The sea port "Ust–Danube" (Dunajsk Port) was connected to Kiliya arm via the Prorve arm, a branch that needed large scale straightening and dredging. After 1991, the dredging works in the Prorve arm were reduced sharply for economic reasons and the entire arm soon became shallow, especially at its entrance.

By autumn 1993, the canal through the Prorve arm ceased to be navigable. Its loss gave rise to a national discussion on the need to design a new deep water route on the Ukrainian side of the delta. The primary concern was that the Ukrainian river ports were now connected to the Black Sea only via the Sulina canal in Romanian territory as there were two problems: longer routes to reach the sea and higher costs for the Sulina canal transit and services.

Figure 2 – The Kiliya arm and Bystroe canal



Source: Slides presentation of "delta-pilot branch of State enterprise – Ukrainian sea ports authority"; Izmail, July 2015

Reopening of the Prorve arm was discarded as a possibility due to costs. Then, amongst the alternative options, the Ukrainian authorities opted for connecting the Kiliya arm to the Black

Sea via the Bystroe canal. The canal which, according to the Danube Commission statistics had previously been actively used in the 1950s, required dredging and an access channel to be constructed in the shallow waters of its mouth.

The Kiliya arm and the international navigation norms

According to the 1948 Belgrade Convention, the "regime of navigation established shall apply to the navigable part of the Danube River between Ulm and the Black Sea through the Sulina arm, with outlet to the sea through the Sulina channel".

With respect to the Kiliya arm, only the sector from Reni (km 172) to Izmail Chatal (km 116) is subject to the Belgrade Convention. The downstream section from Izmail Chatal to the Black Sea, where the Bystroe canal is located, is not part of the Belgrade Convention and according to the list of Main Inland Waterways of Europe ("Blue Book") of the UNECE (2012), is defined as waterway E80-– (IDEA II project, 2015).

Being part of Ukraine territory, the Kiliya arm does not belong to the EU TEN-T, the transport network of inland waterways and ports, and is neither considered within the EU Fairway Rehabilitation and Maintenance Master Plan.

2.2 THE BYSTROE CANAL PROJECT

Key findings

- *There were two phases in the Bystroe canal design: Phase I for the navigation of ships up to a draught of 5.85 m and Phase II for ships up to a draught of 7.20 m.*
- *Phase I was completed in 2004 and restored in 2007. It included the dredging of the canal, the construction of a dam on the sea mouth and the dredging of some parts of the Kiliya arm.*
- *According to Ukraine documents, the cost of Phase was around 13 million Euro, while the cost foreseen for Phase II is around 90 million Euro.*

2.2.1 THE OBJECTIVES

By connecting the Kiliya arm to the Black Sea, the Bystroe canal aims to ensure passage of maritime vessels and improve navigation conditions of seagoing ships travelling to and from the Ukrainian river ports on the Danube e.g. Kiliya, Izmail and Reni, where goods are transferred to and from barges or railways and trucks.

According to the Ukrainian authorities, the Bystroe canal project could play a pivotal role in the development of a sustainable shipping industry in the Ukrainian part of the Danube delta and could enhance economic growth of the region.

2.2.2 THE PHASES I AND II

The project for the restoration of the Bystroe canal navigability was designed in two phases (see Figure 3):

- Phase I - already completed - to allow the navigation of vessels up to a draught of 5.85 m and
- Phase II - not yet realized - to allow the navigation of vessels up to a draught of 7.20 m.

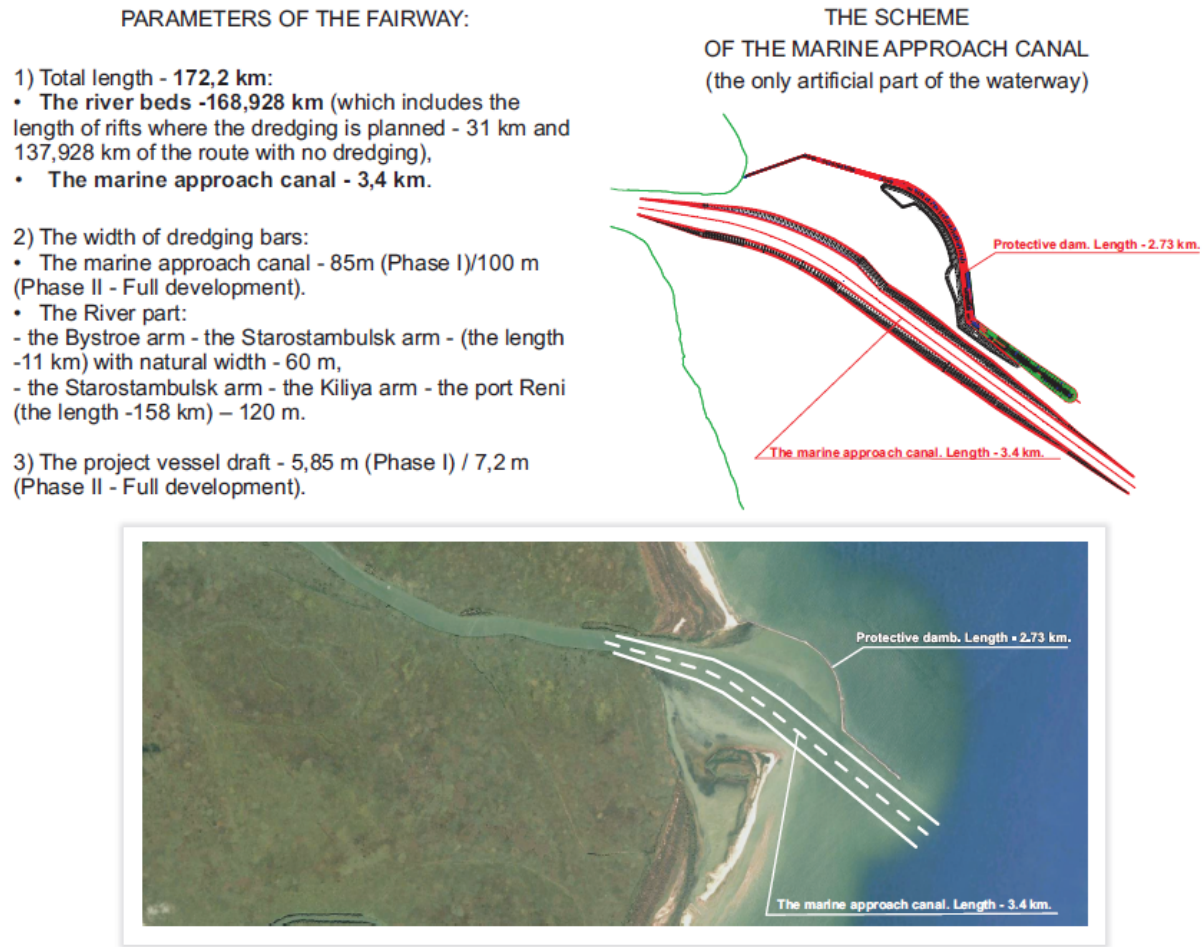
Neither detailed designs nor brief summaries for both phases were available for the purpose of this study, so the following considerations are derived from the analysis of different documentation. Therefore, it is important to emphasise that the final picture remains unclear to some extent as the information on both quantity of dredged, or to be dredged, material and works performed, or to be performed, varies from source to source.

The first feasibility study of the Bystroe canal project was submitted in 2001 to the national government by the Ukrainian company Delta-Lotsman (now Delta Prospect). Its aim was to

develop the Danube-Black Sea Deep Water Navigation Route (DWNR). The project covered both the Danube delta in Ukraine and the Danube River section that lies at the boundary between Ukraine and Romania. This study also included an assessment of the environmental impacts.

A revised version of the feasibility study was delivered in 2002. This version included various options for the DWNR and the environmental authorisation procedure ("State ecological examination" according to Ukrainian legislation). The Bystroe canal was seen to be the best option.

Figure 3 – Detail of the maritime approach to the Bystroe mouth



Source: Slides presentation of "delta-pilot branch of State enterprise – Ukrainian sea ports authority"; Izmail, July 2015

2.2.3 THE WORKS

In 2003 the Ukraine government approved the project and adopted the Bystroe variant as the seaward branch of the DWNR. According to the Ukrainian authorities, the Government of Romania was informed of the project's approval, but the latter raised concerns.

As mentioned, the project implementation was envisaged in two steps: Phase I for the navigation of vessels with a draught of 5.85 m and Phase II for navigation of vessels with a draught up to 7.20 m. Phase I works started in May 2004 and the waterway was opened for navigation in August 2004. The works consisted of:

- deepening the sandbar section of the Bystroe canal;
- dredging some rifts in the Kiliya branch from Izmail to Vylkovo and
- constructing part of the retaining dam into the Black Sea (perpendicular to the coastline).

Following the completion of Phase I in August 2004, larger vessels started using the Bystroe canal (the traffic trends are described in chapter 4). However, by March 2006 the canal had silted up and became unusable by the largest vessels. Dredging works to re-open the canal began in November 2006 and were completed shortly afterwards. Full operation of the route re-started in April 2007.

With regard to Phase II, a new environmental authorisation procedure was started in 2005 addressing dredging of various rifts upstream, the location of the dump sites and completion of the retaining dam. The project environmental authorisation procedure was initially rejected by the Ukrainian Ministry of Environment in August 2005 but it was later approved following revisions in May 2006.

2.2.4 THE PROJECT CHARACTERISTICS

The aim of the Bystroe canal project was to improve the route with deepening works so that vessels with a draught of up to 7.20 m navigate it by the end of Phase II. The project also included protective hydraulic engineering structures designed to ensure safe passage for seagoing traffic. These were mainly located in the shallow waters of the Kiliya arm, at the bifurcation of the Bystroe and Starostambulske branches, and at the sandbar section of the Bystroe canal.

The two phases, including the environmental aspects (or *State ecological examination* according to Ukrainian legislation), were subject to a separate national authorisation procedure. The Phases specifically consisted of:

I. Digging to a depth of 7.65 m with a bottom width of 85 m and construction of a stone sea dam of 1.54 km long for the navigation of vessels with a draft of 5.85 m. Dredging works included the rifts in the Kiliya branch upstream of Vilkovo and the access channel in the sandbar at the mouth. The retaining stone dam was designed to reduce the siltation in the excavated access channel as a result of the sand redistribution driven by strong North-East winds.

II. Digging to a depth of 8.32 m, increasing the bottom width to 100 m, extending the dam to 3 km in length and deepening and strengthening the banks of the Kiliya arm, for the navigation of vessels with a draft of 7.2 m. Phase II therefore anticipated further deepening of the route in the River plus additional engineering works seaward from Vilkovo.

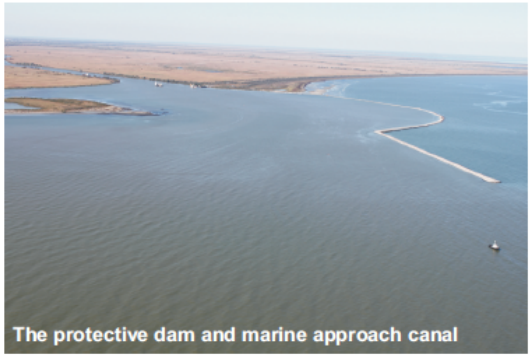
Figure 4 – Images of the Bystroe canal

The route consists of the following parts:

The marine approach canal with 3,4 km length (the only artificial part of the fairway). The navigation was foreseen one-way traffic.

The Black Sea - Vilkove area is projected on the Bystroe mouth and by Starostambulsk and Kiliya arms. The navigation on the Bystroe mouth was foreseen one-way traffic. By the Starostambulsk and Kiliya arms the navigation is two-ways. The dredging is needed only in the area where the Bystroe arm branch off the Starostambulsk arm.

The Vilkove - Izmail Chatal area - goes by the Kiliya arm. It has the two-ways navigation. This part has eleven dredging areas.


The protective dam and marine approach canal

The Izmail Chatal - Reni area - the navigation is provided by the existing fairway according to the pilot map of the Danube river. It has the two-ways navigation.


Natural deep water fairway


The Izmail Chatal

Source: Slides presentation of "delta-pilot branch of State enterprise – Ukrainian sea ports authority"; Izmail, July 2015

2.2.5 THE COSTS

According to project estimations of WWF in 2009, the initial cost for both phases amounted to 144.9 million UAH (24 million Euro); the costs for Phase I amounted to 35.6 million UAH (6 million Euro). The estimates were revised when the construction started and the costs of Phase I increased to 78.6 million UAH (13.1 million Euro). The latest figures for Phase II are reported to be 540 million UAH (90 million Euro).

Phase II would include additional digging of about 4.5M m^3 in the river and sandbar sections, approximately 1.2M m^3 in the seaward access channel and approximately 0.03 M m^3 along the

retaining dam. In total the additional dredging is estimated at 5.73M m^3. Maintenance dredging in the seaward part is expected to be about 1M m^3/year. Maintenance spoil will be dumped at the offshore site until it reaches its capacity of around 5.4M m^3. Our estimate of construction and maintenance costs for Phase II are summarised in Table 1 and Table 2.

Table 1 - Estimation of construction costs for Bystroe canal project - Phase II

Construction						
Dredging		Retaining dam		Riverbank strengthening		Total
Volume (Mm^3)	Costs (EUR/m^3)	Length (m')	Costs (EUR/m')	Length (m')	Costs (EUR/m')	Costs (MEUR)
5.73	5	1500	15,000	2,100	15,000	82.65

Table 2 - Estimation of yearly maintenance costs for Bystroe canal project - Phase II

Maintenance				
Dredging		Retaining dam	Riverbank strengthening	Total
Volume (Mm^3)	Costs (EUR/m^3)	% of costs	% of costs	Costs (MEUR)
1	5	2.5	2.5	6.4

In contrast maintenance activities required for the Kiliya arm, that will be overseen by the Romanian administration, involve 13 buoys, 13 beacons and 19 costal navigation marks. Data is not available for maintenance activities nor costs on the Ukrainian side.

2.3 THE CURRENT STATUS OF THE BYSTROE CANAL

Key findings

- *The Bystroe canal was realised following the Phase I project design.*
- *The last dredging was performed in 2007 and only minor maintenance works are performed since then.*
- *Due to the siltation, the depth near the mouth of the Bystroe canal currently ranges around 2.5 to 3.0 m.*

Information provided by Ukrainian authorities, following a site visit in July 2015, shows the current situation to be as follows:

- The Bystroe canal was realised in accordance with the parameters of the project Phase I (length of 3.30 km, width of the bottom of 85m and depth of 7.65 m). This includes approximately 1.8M m^3 dredged material (Espoo Inquiry Commission report 2006) that has been deposited in the Black Sea.
- The retention dam, whose main purpose was to reduce siltation caused by marine winds in the access channel, has been completed and is in operation. Figures for the volume of the material used for the construction are not available.
- Dredging of the rifts along the Kiliya arm involved a volume of about 1.9M m^3, /(Espoo Inquiry Commission report, 2006). The last dredging was performed in 2007.
- Since 2007 the canal depth has not been maintained and is currently far shallower than the Phase I project parameters specify.

It is very difficult to estimate the volume of maintenance dredging needed due to wide seasonal and annual variation in the sediment load, associated with the inconsistency in the river discharge. The Espoo Inquiry Commission report (2006) suggests that up to some 10% of the total annual suspended load carried via the Kiliya arm is retained and deposited along the river section between Izmail and Vilkovo. This suggests annual sedimentation rates ranging between 0.31 to 3.39M m^3, with an average annual rate of 1.31M m^3 over the period of 1980 - 2004. An unknown quantity will be deposited on the dredged rifts and has to be removed. These figures suggest a yearly average volume of maintenance dredging in the order of several hundred-thousand m^3. According to this analysis and documentation examined, the volume of Phase I maintenance dredging can be estimated to be in a range of 500,000 - 800,000 m^3 annually.

It is worth mentioning that, as recorded by the Fairway Rehabilitation and Maintenance Master Plan for the Danube and its navigable tributaries (EU Danube Strategy, 2015), the following additional activities took place in 2014 on both the Kiliya arm and Bystroe canal:

- hydrographical survey of sea approach channel (twice, using multi-beam);
- hydrographical survey of a section from 65.8 km to 64.0 km (surveyed once by single beam equipment);
- Fairway relocation activities - shifting the fairway makers and deployment of additional buoys following the shift of the natural fairway toward the left bank of 50 - 70 m.

At the 34th Meeting of Standing Committee of Convention on the conservation of European wildlife and natural habitats, held in Strasbourg, 2-5 December 2014 (Ministry of Foreign Affairs of Romania, 2014), the Ukrainian delegation said that in the years 2012 and 2013 only small scale dredging was undertaken.

Up-to-date information on the current depth and width of the Bystroe canal is not available because the recently performed hydrographic measurement figures cannot be obtained. It is not known the hydrographic measurements are performed on a regular basis (at least annually), or only occasionally.

During the site visit of July 2015, it was observed that the current depth near the mouth of the Bystroe canal ranges between 2.5-3.0 m due to the intense siltation phenomenon. The Ukrainian authorities interviewed during the site visit were of the opinion that decreasing depth of the canal route, together with the tariff policy applied on the Sulina canal since 2010 (see chapter 4), are the main cause of the decline in seagoing traffic via the Bystroe canal.

2.4 DIVERGING VIEWS BETWEEN ROMANIA AND UKRAINE

Key findings

- *The disagreement between Romania and Ukraine dates back to 2004 when Romania appealed to Espoo claiming the transboundary environmental impact of the project.*
- *The Espoo convention sets out the obligations to assess the environmental impact of certain activities at an early stage of planning and obliges the countries to notify and consult each other on projects that are likely to have a significant adverse environmental impact across boundaries.*
- *The divergence of views among the two countries refers also to the decision making process of the canal project and the project selection procedure adopted by Ukraine.*

In 2004, soon after the opening of the canal to commercial navigation, Romania instigated an international complaint against Ukraine's unilateral decision to carry out the works within the protected area of the Danube delta and requested that the Espoo Convention (United Nations, 1991) be applied. Where projects may have transboundary impacts, the Espoo Convention provides for specific procedures to be followed by the country proposing works, including international consultation and impact assessment. The Romanian Government's action prompted bilateral discussion between the two countries that, over the years, led to suspension of the Bystroe canal maintenance works and postponement of project Phase II.

Diverging views refer to the adverse transboundary environmental effects, the decision making process of the canal project and the project selection procedure adopted by Ukraine.

2.4.1 THE ENVIRONMENTAL IMPACTS

The objections raised about transboundary environmental impacts are central to the disagreement between the Ukrainian and Romanian governments. Following the Romanian complaint, the Espoo Inquiry Commission identified some "likely significant adverse transboundary impacts".

The main environmental impacts credited to have a transboundary character were those related to hydrology and repartition of water flow among the various mouths of the delta, quality and turbidity of waters from sediment discharge and dumping of spoil in the coastal zone, pollution of the coastal waters as a result of dredging works, impact on fisheries and impact on biodiversity because of loss of habitat of protected migrating birds. The research conducted by Ukraine and Romania to support their respective positions focusses on these impacts.

The Espoo Convention

The Espoo (EIA) Convention sets out the obligations on Parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation on States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries. According to the general provisions the Parties shall, either individually or jointly, take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities.

Among the key requirement each Party must establish an environmental impact assessment procedure that permits public participation and preparation of the environmental impact assessment documentation.

The Party of origin should ensure that an environmental impact assessment is undertaken prior to a decision to authorise or undertake a proposed activity that is likely to cause a significant adverse transboundary impact and that affected Parties are notified of a proposed activity that is likely to cause a significant adverse transboundary impact.

Environmental impact assessments as required by the Convention shall, as a minimum requirement, be undertaken at the project level of the proposed activity. As far as possible, the Parties shall endeavour to apply the principles of environmental impact assessment to policies, plans and programmes.

2.4.2 THE DECISION MAKING PROCESS

Romania's main allegation concerning the decision making process was that, as part of the project had to be realised along the river bordering the two countries, Ukraine failed to inform and to invite, according the Convention on Environmental Impact Assessment in Transboundary Context (Espoo Convention), the neighbouring state of Romania as an interested party in the decision and permitting process. Indeed, representatives of both Ministry of Transport and Ministry of Foreign Affairs officially stated during the interviews that Romania did not receive any technical documentation on the Bystroe canal project. In addition, according to Romania,

other bilateral obligations, including the need to have the consent of the other country, regarding cooperation on works carried out along border areas of the river were not followed[1].

It is important to note that at the time of the project design and approval, the Espoo Convention had just come into force and there was insufficient experience as to its application by all Contracting parties, not just Ukraine and Romania. More precisely, the Espoo Convention was adopted in 1991, came into force in 1997, but was only ratified in the Ukraine in 1999 and in Romania in 2001.

2.4.3 THE PROJECT SELECTION PROCESS

The controversy between Romania and Ukraine also focused on the Bystroe canal project selection process. As reported in the project history summarised by the Ministry of the Ecology and Natural Resources of Ukraine (2012), the Romanian party argued that the decision to construct the canal was not based on a solid socio-economic or a proper assessment of alternatives, including solutions located outside the Danube delta to minimise the cumulative impact of seagoing traffic. The Ukrainian party replied that assessments were carried out at all stages of project development and the analysis showed that amongst the different options considered, the Bystroe canal appeared to be the safest and most acceptable from an environmental point of view.

As far as we know, there are no documents proving that detailed investigations were carried out on traffic forecasts along the south-western Ukrainian shoreline to justify the need to dredge to a depth of 7.65 m. Furthermore, a wider approach, encompassing the entire Danube delta, to address beneficial negotiations as to the terms of usage of the Sulina canal as an alternative option, was not taken into consideration by the Romanian and Ukrainian authorities.

[1] *Agreement between the Government of Ukraine and the Government of Romania on Cooperation in the Field of Water Management in Transboundary Waters (signed on 30.09.1997, entered in force on 28.01.1999).*

3 THE ENVIRONMENTAL IMPACT OF THE BYSTROE CANAL PROJECT

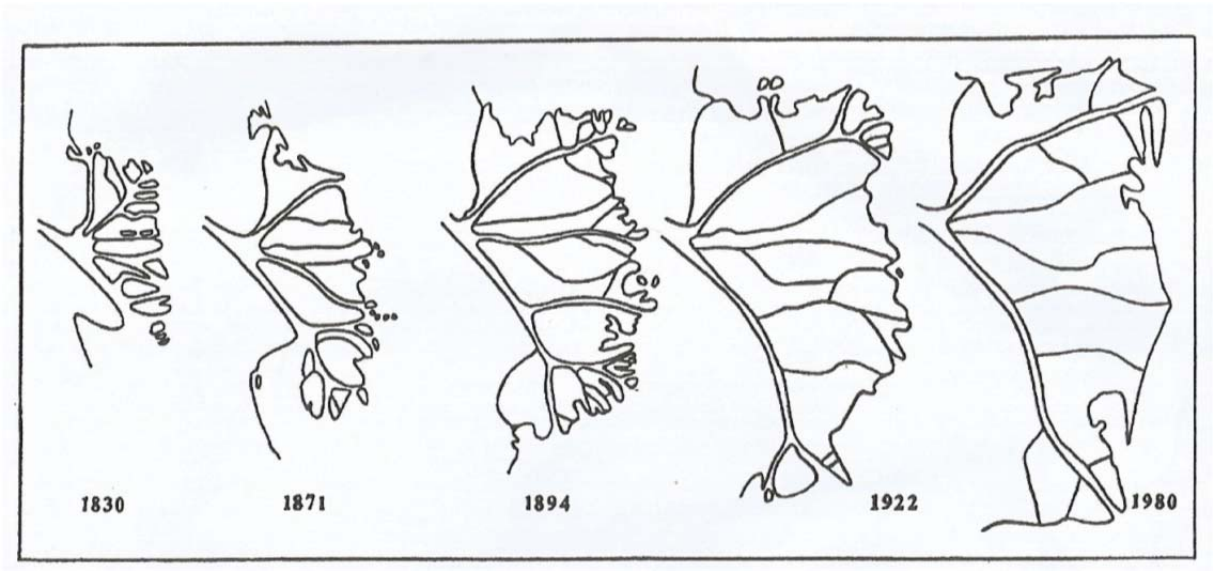
3.1 THE DANUBE DELTA WATER FLOWS

Key findings

- *The Danube delta water flows are influenced by both human and natural factors.*
- *For natural reasons, Kiliya arm is the most dynamic branch of the delta.*
- *The current pattern shows a clear increase in flow discharged via the Tulcea branches (Romania side) and a corresponding decrease in flow in Kiliya arm (Ukraine side).*
- *In case of no action, the Kiliya system will further loose water discharge and the sedimentation of its smaller arms will continue.*

The delta Danube environment has been affected for over a century, as major engineering works have been carried out. Nowadays dredging and strengthening of channels and natural arms take place quite regularly in the area. As a consequence, both natural processes and anthropogenic factors govern the redistribution of river flow in the delta. The region is subject to continuous changes involving flow distribution and quantities of sediment as well as movement of sand islands. In other words, the Danube delta Biosphere Reserve, as with many other protected areas, is partly influenced by human intervention (see Figure 5).

Figure 5 – Diagrams illustrating the Evolution of the Kiliya delta



Source: Document received by Ukrainian MoT

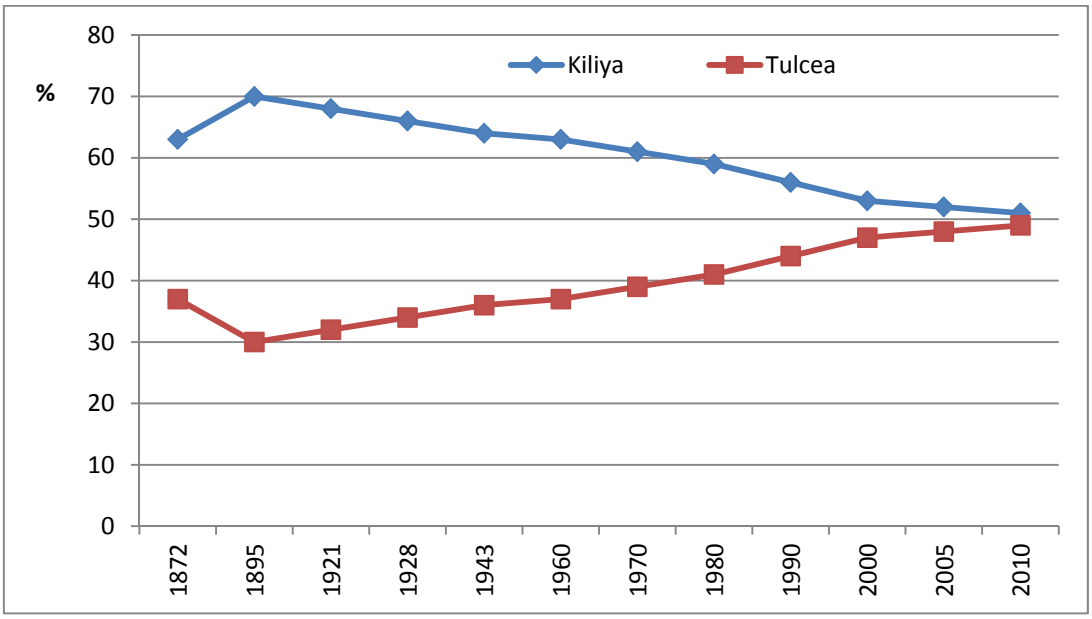
A combination of both the water flow and silting has brought about significant changes over the last 150 years on the Ukrainian side of the Kiliya as illustrated in Figure 5.

The current water flow pattern in the delta is characterized by a clear increase in flow discharged via the Tulcea system of branches (Romanian side) and a corresponding decrease in flow received by the Kiliya system (Ukrainian - Romanian border). From 2012 - 2014, the average flow discharged from the Kiliya arm accounted for 49% of the total flow received in the upper section of the Danube delta, while only 50 years ago the percentage was more than 60% (Ministry of Ecology and Natural Resources of Ukraine, 2015). According to the same source it is expected that, in line with this trend, water flows in all Kiliya major branches will further decline; by 2020, without large-scale hydraulic engineering operations, the Kiliya arm will receive about 47% of the Danube flow.

Within the Tulcea branch, the Sulina canal has seen a steady increase of discharge flow during the 20th century but has been almost stable since 1980, accounting for around 20% of the total Danube discharge. Since then, the Saint George canal, where straightening works were carried out during the 1980's, has attracted increasing water flows.

The graph in Figure 6 illustrates the historical changes in flow discharge for Kiliya and Tulcea, the two main branches of the delta.

Figure 6 – Water flow distribution among main Danube delta branches



Source: Danube Hydrometeorological Observatory

On the Kiliya branch, which is the most dynamic one at the natural point of view, several changes have been observed over the last century. While larger branches that had been used

for navigation slowly silted, the Bystroe canal was the branch with the strongest natural water flow increase, representing, at the beginning of the 21th century, nearly 20% of the Danube discharge. The main changes that have occurred on the Ukrainian side of the delta over the last decades are detailed below:

- the entire Kiliya arm suffered significant loss of discharge and heavy sedimentation in smaller branches particularly in the Ochakov branch at Vilkovo town which lost about 40% of discharge during the last decade following digging of the Bystroe canal and continues to narrow with new islands emerging;
- the Prorve canal water depth at the former Ust-Dunaysk has reduced to 1 m or even less;
- the naturally shallow mouth of the Starostambulske arm (located in the delta Biosphere Reserve where there has not been any hydro-technical intervention) is slowly being blocked by the Novaya Zemlya island, possibly as a result of the Sulina canal breakwaters that stretch from the Sulina canal outflow to the north, isolating Musura Bay and the Starostambulske arm;
- the fairway depth of the Bystroe canal at is mouth has dropped to 3 m or less due to reduced maintenance work.

It can be concluded that if no action is undertaken the Kiliya system will go on losing a significant part of water discharge and sedimentation of its smaller arms will continue.

In addition to flow modifications, the monitoring report highlights that “New plant and animal species appear in the Danube Biosphere Reserve, many of which are new to the Ukraine e.g. about 60 new flora species have appeared over the past 20 years. The arrival of new species is largely attributed to significant transport flows. It is therefore recommended that a new regional species monitoring centre is established and action should be taken to control/limit the distribution of dangerous species” (Ministry of Ecology and Natural Resources of Ukraine, 2015).

These findings, even if only accurate in part, require attention and urgent intervention with appropriate measures. There is evidence, highlighted by the WWF (2015) and the Romanian monitoring report (Ministerul Mediului şi Schimbărilor Climatice – Direcţia de Management si Control al Resurselor de Apă şi Piscicole, 2013), that some changes in flow and sediment distribution were in part attributed to Phase I activities of the Bystroe.

3.2 THE IMPACT OF THE CANAL CONSTRUCTION AND MAINTENANCE

Key findings

- *The Ukraine and Romania positions on the environmental impact of the canal construction and maintenance diverge.*
- *Romania points out the impacts in terms of change of flows discharge, water quality and fish habitat and migration flows.*
- *According to Ukraine no significant transboundary impact may be clearly ascribed to the Bystroe canal project.*
- *No information is available on the delta area status before the Bystroe canal intervention.*
- *The impacts highlighted by Romania could be attributable to a mix of different causes, such as natural changes, human activities in other parts of the Danube basin, and to a certain extent also to the Bystroe canal.*

3.2.1 THE UKRAINIAN POSITION

Based on recommendations from the Espoo inquiry commission, Ukraine started a monitoring programme of the impact that works and navigation had on the Bystroe canal. The latest results were presented in the "*Comprehensive Environmental Monitoring during the Construction and Operation of the Danube – Black Sea Deep Navigation Route in 2014: Maritime Access Channel"* (Ministry of Ecology and Natural Resources of Ukraine, 2015). During the course of these monitoring activities the emphasis was placed upon tracking both:

- direct (and indirect) impacts of maintenance dredging works in the maritime access channel on the ecological status of the seashore and other natural environments and
- anthropogenic factors that shape the situation in the study area e.g. hydrological regime, river water and sediment flows, water chemistry, maritime delta dynamics and state of food resources supporting fish, fauna, etc.

The focus was on the impacts identified by the Espoo Inquiry Commission as the "likely significant adverse transboundary impacts" which include those listed below.

1. Impact of dredging on the distribution of the flow discharge between the Bystroe and the Starostambulske branches and on water level dynamics along the Bystroe branch, resulting in loss of floodplain habitats of fish (spawning and nursery) and birds (for nesting and feeding);

2. Impact of loss of habitat as riparian dump sites are used, dredging through the offshore sandbar and measures for bank protection on birdlife and fish;
3. Impact on the increase of suspended sediment concentration, downstream of the dredging site, on fish populations;
4. Impact on the turbidity of marine waters as a result of dumping of spoil at the dumpsite at sea and southbound alongshore currents;
5. Impact of repeated maintenance dredging which hampers the recovery process of fish habitats in the long term;
6. Cumulative effects caused by shipping upon fish and birds habitats on both a large scale and over the long term.

The report concluded that the scale of environmental impacts associated with the navigation route's operation were as anticipated by the design projections and confirmed that there was no significant transboundary impact that could be clearly attributed to the Bystroe canal project.

Besides the transitory impacts that might be attributable to dredging works, the report suggests that changes occurring in the Danube delta ecosystem have been brought about by a number of traditional, natural and technogenic factors. In conclusion, the Ukrainian monitoring results determine that there is neither transboundary nor nationally relevant impacts caused by the canal project activities. It is important to note that good collaboration with Romanian experts is mentioned in the report and that there are no negative comments from scientists regarding the quality of monitoring activities, or regarding interpretation of the results.

3.2.2 THE ROMANIAN POSITION

Romania conducted a comprehensive study on the border with Ukraine to monitor possible transboundary impacts in the Danube delta with effect from 2010 (Ministerul Mediului şi Schimbărilor Climatice Direcţia de Management şi Control al Resurselor de Apă şi Piscicole, 2013), which included a comparison of specific environmental parameters measured before and after the works were carried out on the Bystroe canal.

The analysis concludes that some changes have occurred, some of which might be attributable to the works performed on the Bystroe canal. The main points of concern are linked to:

- the level of discharged flows through the Kiliya delta; an increase in discharge through the Bystroe would decrease the discharge from the Starostambulske arm with an added risk of higher siltation at the mouth of the Sulina canal;
- the quality of water; measurements showed an increase of noxious substances for the period 2004 - 2009 period in comparison to the period 1998 - 2003;

- the likely impact of heavier navigation and regular maintenance dredging on fish (migration, spawning), birds and fauna.

During the September 2015 meeting at the Romanian Ministry of Environment and Water Management it was mentioned that the changes in low water frequency were a transboundary effect of the Bystroe canal Phase I works.

The Romanian analysis particularly highlights the likely impact on sturgeon populations and habits, an area disregarded by the Ukrainian report also due to lack of funding. The risk reported by Romanian study is based on their knowledge of the Sulina canal. Sturgeons are no longer passing through thanks to the repeated dredging works needed to keep the canal operational. At the same time other bird species are no longer nesting in a large area around the canal. These same concerns were raised during meetings held with the Romanian NGOs (WWF and ECCG) which set down that monitoring of sturgeons' migration as a precondition for the Bystroe project.

An estimate of the sturgeons' distribution between different routes is provided in the Romanian monitoring report, which apportions 53% to Kiliya and 47% to Tulcea (Ministerul Mediului şi Schimbărilor Climatice Direcţia de Management şi Control al Resurselor de Apă şi Piscicole, 2013). However, it should be noted that the same report identifies the Starostambulske arm as the main route for migrating sturgeon populations rather than Bystroe, although measurement on Bystroe could be underestimating the flow through it. These diverging points of view were confirmed during the meetings held at the Ukrainian Ministry of Ecology and Romanian Ministry of the Environment.

3.2.3 SOME CONSIDERATIONS

It is not reasonable to make judgements as to the possible impacts of the Bystroe canal based only on these two reports. On the one hand, the Ukrainian monitoring during maintenance dredging activities, together with analysis of the documentation and consideration of proposed mitigating measures conclude that the transboundary impact would have been contained within acceptable limits. By contrast, evidence provided by the Romanian report suggests that any negative impact could be attributable to a range of causes such as natural changes, human activities in other parts of the Danube basin and, though only to a limited extent, the Bystroe canal activities.

Exchange of data and combined monitoring activities would have allowed a better understanding of the impacts. Unfortunately, this joint approach, proposed by several international organisations, has not been pursued so far. In order to plan and implement the further interventions in the area, a cooperative approach regarding exchange of information is necessary and should be complemented by joint research and shared knowledge.

3.3 COMPLIANCE WITH INTERNATIONAL CONVENTIONS

Key findings

- *Given the wide settings of the international conventions and agreements, the analysis of the Bystroe canal project compliance is not straightforward.*
- *Although the project did not initially respect the obligations of the Ramsar Convention on nature protection, the Conference of Parties closed its case in the year 2012 based on the documentation provided.*
- .
- *The transboundary impact of the canal project was the main cause of the Romania complaint to the Espoo Convention committee.*
- *The Espoo convention committee intervention stopped the project phase II and led to a series of meetings among the two parties that are still going on.*

From the very beginning there has been heated debate as to whether the Bystroe canal project met numerous international conventions and agreements and to what extent it violated related obligations. These issues were detailed in many studies, documents, notes and press releases made available by both parties: Espoo Inquiry Commission (2006), European Union (2015, WWF (2009a), Ministry of Transport of Ukraine (2015), WWF (2015), Ramsar Secretariat (2003), Leither H. (2004), Duţu M. (2004), etc.

The issue is not one-sided or straightforward and, unfortunately, most of the problems stem from the fact that different interpretations of the conventions and agreements are formed.

The current situation is described well by Professor Mircea Duţu in the *"Legal Implication of the Baystroe Danube-Black Sea Canal Project".* Although this probably focusses on the Ukrainian report, his statement could apply to the position taken by both countries and beyond (Duţu M, 2004):

"*On the whole, the Bystroe case shows that, at the inter-state level, environmental interests still come second to economic, strategic-military and political ones, and traditional sovereignty concept is maintained de facto in spite of formal consecration of the thesis of trans-national cooperation. Furthermore, international, including European, conventions are perceived as too general, and thus less applicable, which points to the need to adopt sub-regional and bilateral agreements better adjusted to the ecological specifics and to politico-strategic context of the region, and therefore more effective. The sad reality is also revealed that some states of the former communist zone, although signing, joining, and ratifying numerous international legal instruments, and thus demonstrating an active presence on the international arena, do not live*

up to the principles and basic rules deriving from international law at the start of the 21st century."

3.3.1 NATURE PROTECTION

The Bystroe canal is located within the Ukraine Danube Biosphere Reserve (as a part of world heritage under UNESCO protection), an area listed by Ukraine under the Ramsar Convention as a Wetland of International Importance on 23 November 1995 and Kyliiske Mouth Ramsar Site on 12 October 1976 (Ramsar Secretariat, 2003).

The area is also the habitat for several strictly protected plant and animal species and for this reason falls within the scope of the Bern Convention on the Conservation of European Wildlife and Natural Habitats (Leither H., 2004).

The European Union meets its obligations under the Convention by means of the Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) and the Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive). These conventions do not explicitly prohibit signatory states activities, but impose an obligation by signatory states to take into account, while planning activities and land use, the specific features of the environment and the species that inhabit the area.

The obligations of the Ramsar Convention

As an example, the Ramsar Convention on wetlands places the parties under the obligation to "formulate and implement their planning so as to promote the conservation of the wetlands included in the List (art. 3), to compensate for any change made to such wetland areas (art. 4.2) and to consult with other concerning trans-frontier wetlands (art. 5)". The conservation of migratory species of wild animals places the parties under obligation to "conserve the habitats of species listed in appendix I and prevent, remove, compensate for minimize factors that endangered or are likely to further endanger these species (art III, $.a, b, c)".

This allows, the Ramsar Convention to be used as an argument to ban all activities in protected areas, but at the same time, signatory states can exploit the mentioned provisions to argue that appropriate mitigating and compensatory measures are implemented to meet all the requirements of the same Convention.

Being the Danube Delta inscribed in the list of Wetlands of International Importance maintained by Ramsar Convention, Ukraine did not fulfil the provisions of its Article 5, which requires the Contracting Parties to consult about implementing obligations arising out of the Convention in respect of a wetland extending over the territories of more than one Contracting

Party. Two resolutions, respectively during the 9th and the 10th Conferences of the Parties, were adopted on this matter and Ukraine was required to submit information on the project.

After the 11th Conference of the Parties to the Ramsar Convention held in July 2012 in Bucharest and following the report of the Ukraine Secretariat, the case was eventually closed, even though the Secretariat of the Convention states that it is not fully convinced "*that no significant human-induced negative ecological change may still occur at the transboundary Ramsar site*" and it remains "*alert about any new and substantial information on negative change occurring*".

3.3.2 TRANSBOUNDARY IMPACT

The Espoo Convention governs assessments on transboundary environmental impact (see Espoo Convention, section 2.4.2). The Convention was adopted in 1991 and came into force in 1997. It was ratified by Ukraine on 20 July 1999 and by Romania on 29 March 2001.

In 2004, Romania initiated a procedure for non-compliance with Espoo provisions against Ukraine and refused to grant approval for the Bystroe canal project, until the issue was settled formally. One of the first examples of Espoo Convention application, Espoo commenced proceedings in the same year. The Espoo Inquiry Commission prepared a Report on the Likely Significant Adverse Transboundary Impacts of the Danube-Black Sea Navigation Route at the border of Romania and Ukraine (Espoo Inquiry Commission, 2006), based on several documents e.g. Ministry of Environment and Water Management (2005), Ministry of Environment Protection of Ukraine (2005), O'Connell M. (2006) and WL – delft hydraulics (2006).

Among the numerous proactive recommendations included in the report, the following statements are very important:

- The Commission, realising that the Navigation Route is and will be a political issue, recommends the two countries organise a Bilateral Research Programme related to activities with transboundary impacts within the framework of bilateral cooperation under the Espoo Convention.
- The Commission recommends further that this Bilateral Research Programme is set up as soon as possible and, addresses the gaps in scientific information and knowledge relating to the general problem of dredging a navigation route in the vicinity of the Romania-Ukraine boundary.

At the 4th Conference of the Parties of the Espoo Convention held on 19 - 21 May 2008 in Bucharest, the following findings were made by the Implementation Committee:

- Ukraine had not met its obligations under the Espoo Convention and
- a recommendation was made to the Cabinet of Ministers of Ukraine to immediately cancel the "Establishment of the DWNR Danube-Black Sea in the Ukrainian Part of the

delta" Project and that no works on the Phase "Full Scale" of the Project should be launched until the Ukraine had demonstrated that it had applied the Convention provisions.

By Decree of the Cabinet of Ministers of Ukraine of 02.04.2008 № 295, the Interagency Coordinating Council on the implementation of the Espoo Convention in Ukraine (hereinafter - ICC) was established and chaired by the Minister of Ecology and Natural Resources of Ukraine in order to implement the provisions of the Espoo Convention.

The Sixth Conference of the Parties of the Espoo Convention in June 2014 analysed data and proposed further steps to bring the DWNR Danube-Black Sea project into full compliance with the Espoo Convention, including as a key step the request to adopt and implement a new legislation. As accompanying measures, the Conference requested the Government of Ukraine to inform Romania about existing monitoring results and to consult with Romania on the post-project analysis, and encouraged the Governments of Romania and Ukraine to further develop the bilateral agreement for improved implementation of the Convention.

A meeting between the parties was held on 5 March 2015, at the premises of the Ministry of Ecology and Natural Resources of Ukraine. During the consultations, the Parties finally came to a common understanding of the need for bilateral monitoring of the Danube delta. According to Ukrainian delegates, the Romanian side agreed to withhold any disagreements on Phase I of the Project and to consider Phase II as a new project. However, these proposals were not confirmed by Romania during the meeting held at the Ministry of Environment and Water Management on September 22, 2015.

3.4 THE POSSIBLE MITIGATION MEASURES

Key findings

- *Mitigation measures are extremely important to preserve the natural habitat of the Danube delta.*
- *The Bystroe canal project documents describe a number of mitigation measures and some of these require significant civil works.*
- *The available data are not enough to estimate the cost of such measures.*

Given that the Bystroe canal project is located within an environmentally protected area, the mitigation measures play an important role in guaranteeing its sustainability. The documents analysed propose a series of mitigating measures related to both design and construction of the canal and its maintenance. A set of comprehensive and detailed mitigation measures developed according the international practices had already been proposed in the environmental assessment prepared for Phase I in 2003 (USRIEP, 2003). Following numerous comments and recommendations made by the national and international interested parties, these mitigation measures were updated and detailed in the EIA for Phase II in 2009 ("Final Decision on the Implementation of the Full-Scale Phase of the Danube-Black Sea Navigation Route Project in the Ukrainian Part of the Danube delta developed in 2009").

Based on monitoring data in 2014 (Comprehensive Environmental Monitoring during the Construction and Operation of the Danube – Black Sea Deep Navigation Route in 2014: Maritime Access Channel") complementary mitigation measures particularly for the protection of Danube Biosphere Reserve, were developed. These measures are targeted at limiting the impacts identified by the Espoo inquiry commission in compliance with the recommendations made by the Ramsar and Bern conventions. More specifically, they relate to transboundary impact, cover all environmental areas and animal species, whilst also combining navigational management and environmental protection functions, and propose future technological measures.

Some of the proposed measures require significant civil works to ensure a relatively constant flow through the Kiliya arm, implement flood defences, protection against alien species, protection of bird nesting colonies and making adaptations to accommodate climate change, etc. Many of these measures will most probably be necessary regardless of whether Bystroe canal and Kiliya arm will be used for navigation or not.

Interestingly, a recent WWF report on climate change adaptation strategy and action plan for Danube delta region, mentions the possible impacts of climate changes on the area and proposes further upgrading of mitigation measures.

Although the type and number of mitigation measures proposed are consistent with the need to limit the environmental impact and in particular the kinds of impact that were deemed to have transboundary relevance, it is not clear which measures were already realised.

Furthermore, with the available information it is not possible to estimate the costs of the mitigation measures if the project is implemented.

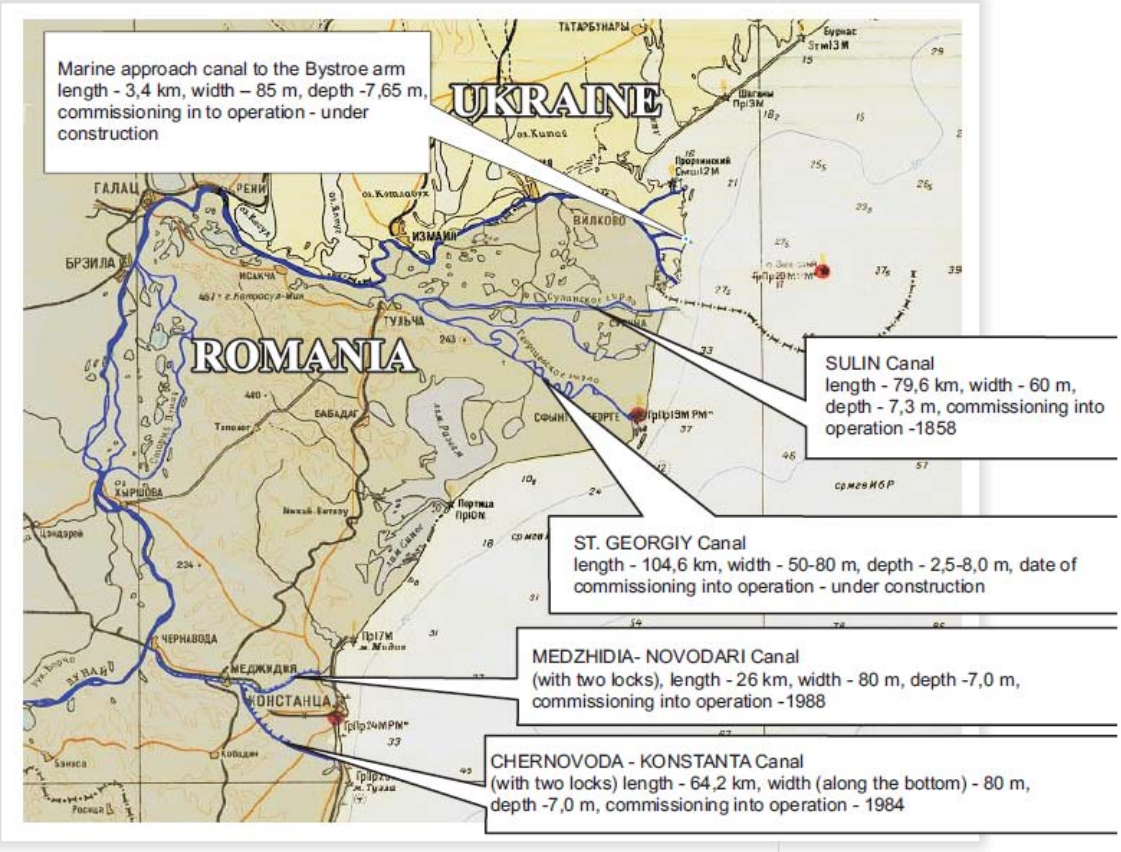
4 THE CURRENT STATE OF NAVIGATION IN THE REGION

4.1 THE DANUBE DELTA BRANCHES

Key findings

- *There are three navigable routes in the Danube delta: Sulina and St George canals in Romania and the Kiliya arm on Ukraine-Romania border.*
- *The Sulina canal and the Kiliya arm are the ones used by maritime vessels.*
- *The traffic on the Kiliya arm is declining due to the progressive siltation of the Bystroe canal as a consequence of lack of maintenance.*
- *The Sulina canal is by far the most important link in terms of traffic; however, despite the positive traffic trend recorded over the last few years, it is still used at 30% of its capacity since more than 20 years.*

Figure 7 – Existing waterways connecting the Danube with the Black Sea



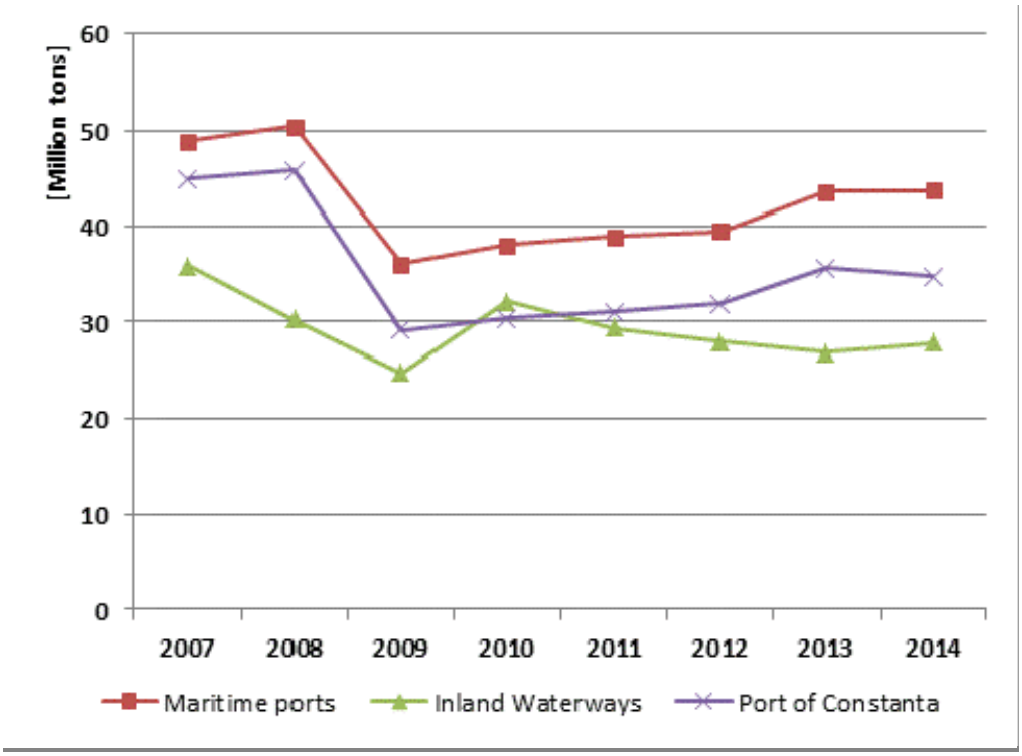
Source: Slides presentation of "delta-pilot branch of State enterprise – Ukrainian sea ports authority"; Izmail, July 2015

The Danube delta region is where the Danube river joins the Black Sea and is crossed by three navigable links. Clockwise from north to south, these are the Kiliya branch (forming part of the Ukraine-Romania border) and the Sulina and Saint George canals which both stem from the Tulcea branch within Romanian territory (see Figure 7).

According to the Belgrade Convention, the section of the Kiliya arm that runs from Izmail Chatal (116 km) to Reni (172 km) together with the Sulina canal are considered to be maritime navigation routes. The Saint George canal is a Romanian inland waterway rather than a commercial navigation route. It is used mainly by small crafts and small passenger vessels that provide local transport for people living in the area.

The third important Romanian inland waterway that lays outside the delta area is the Danube-Black Sea Canal, which is used both for maritime and inland navigation.

Figure 8 – Cargo shipped in Romanian inland waterways and maritime ports



Source: Romania Ministry of Transport

Figure 8 illustrates cargo quantities shipped in Romanian inland waterways and maritime ports for the period 2007 - 2014. After the economic downturn in 2008, the trend for maritime ports shows a partial recovery to the pre-crisis levels, whilst traffic on inland waterways declines (after 2010). The data shows that on average 59% of all traffic is distributed to maritime ports (49% in Constanta) and 41% on inland waterways.

Incomplete data gathered for Ukrainian inland ports does not allow a fully comparative pattern analysis. Nevertheless, it is worth noting that the Ukraine inland ports' traffic approximately halved in five years (period 2008 - 2013), from 8.8 to 4.5 million tons.

4.1.1 THE KILIYA ARM

As per the Belgrade Convention, only the section from Izmail Chatal to Reni of the Kiliya arm is a Danube river navigation route. Navigation on the remainder of the Kiliya arm is regulated by the Agreement signed by the Governments of Romania and Ukraine in 2003 regarding border regime, cooperation and mutual assistance in the border area. According to the treaty, the international navigation in the border waters is only permitted with the consent of both states. Despite the opposition of Romania to this traffic, Ukraine affirmed that there is no limitation to the nationality of vessels. Table 3 shows traffic trends through the Bystroe canal from 2010 to the first half of 2015.

Table 3 - Vessels traffic through the Bystroe canal: cabotage and international navigation 2010 - 2015 (first half)

Vessels	2010	2011	2012	2013	2014	2015 (first half)
Total	1,522	1,339	1,072	1,068	805	234
Cabotage	471	221	312	248	127	53
International navigation	1,051	1.118	760	820	678	181

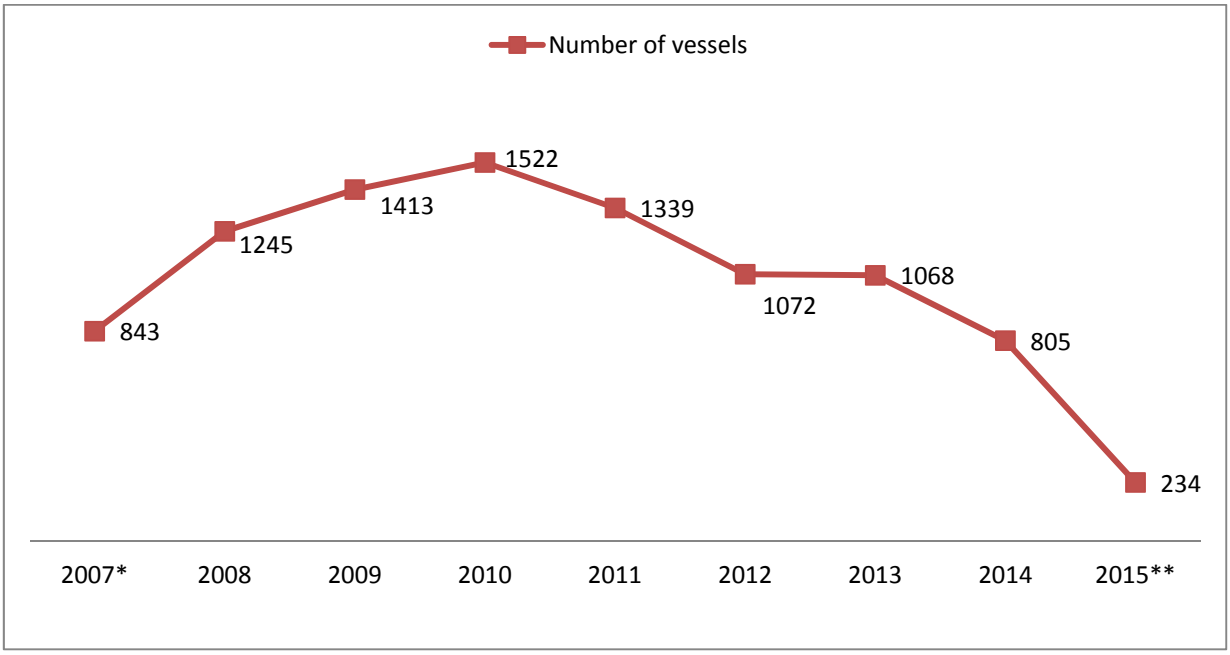
Source: Ukraine MoT

The fees charged on the Bystroe canal are as follows:

- For overseas/ international seagoing vessels: 0.14 US dollars per m^3 of conditional volume / vessel (for each transaction separately - input or output);
- For coastal vessel: 0.014 US dollars per m^3 of conditional volume/vessel (for each transaction separately - input or output).

For ships under international tonnage certificate, with a draught of up to 4.5 m, the rates applicable are reduced by a factor of 0.38.

Figure 9 – Vessels traffic through the Bystroe canal 2007 - 2015 (first half)



* Apr–Dec 2007,

** Jan–Jun 2015

Source: Ukraine Ministry of Infrastructures

4.1.2 THE SULINA CANAL

Figure 10 illustrates the trends in maritime vessels transport on the Sulina canal. From 1989 the canal has been underused at approximately 30% compared to a recorded peak – when more than 10 Million tons used the canal per year.

The Sulina canal is 73 km in length and is divided in two sections:

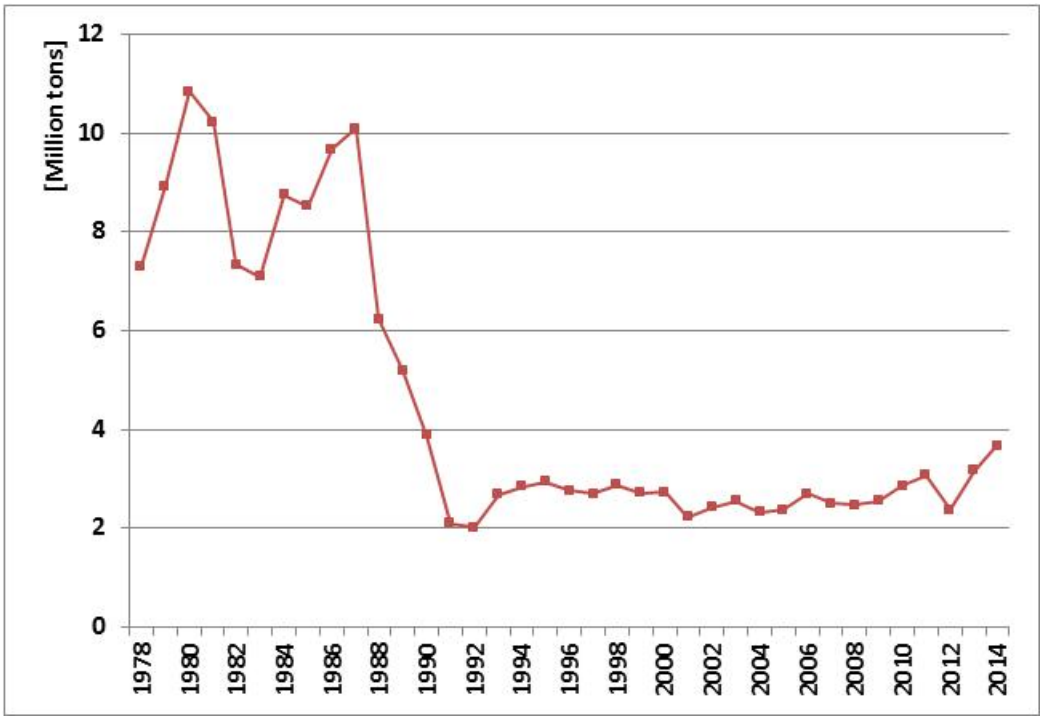
- Sulina Canal (arm) with a length of 63 km, between NM 34 (4 nautical miles downstream of Tulcea) and NM 0 at Sulina;
- Mouth to the Black Sea with a length of about 5.5 NM, located between two guiding dams of some 7.7 km.

The Sulina canal ranges in width between 130 - 250 m. The maintained fairway depth is guaranteed at 7.3 m. The canal was classified as a category VII according to the Danube Commission Classification. The UNECE Blue Book (2012) does not consider limits for length and width of vessels and pushed convoys on the canal.

For maritime vessels, safe navigation through the Sulina canal is available up to 25,000 DWT (Dead Weight Tons) with a maximum draught of 7 m. Larger vessels can transit only partly loaded. There is no fee for inland vessels, whilst maritime vessels are charged as listed in Table 5. Since 2010 ships have been charged on entering and exiting the canal in case they choose an

alternative fairway for entering/exiting the canal. This seem to have forced ships to choose the Sulina canal for the round trip.

Figure 10 – Trend in navigation in the Sulina canal [million tons]



Source: AFDJ

Table 4 - Statistics on cargo transported by maritime vessels through Sulina canal

Year	Tons of cargo		Year	Tons of cargo		Year	Tons of cargo		Year	Tons of cargo
1978	7,309,117		1987	10,090,376		1996	2,759,598		2005	2,370,414
1979	8,926,542		1988	6,232,322		1997	2,707,649		2006	2,700,308
1980	10,835,741		1989	5,202,540		1998	2,886,455		2007	2,510,365
1981	10,232,566		1990	3,879,527		1999	2,712,941		2008	2,469,876
1982	7,335,602		1991	2,098,913		2000	2,732,387		2009	2,551,374
1983	7,100,650		1992	2,018,463		2001	2,236,439		2010	2,870,047
1984	8,756,995		1993	2,684,330		2002	2,428,627		2011	3,067,529
1985	8,519,021		1994	2,842,811		2003	2,562,695		2012	2,372,441
1986	9,670,871		1995	2,937,119		2004	2,331,993		2013	3,168,339
									2014	3,668,096

Source: AFDJ - Galati Lower Danube Administration

Table 5 – Charges for the use of Sulina canal (2015)

Maritime vessel	Measurement unit	Costs
Entrance/exit of loaded ships	Ton (Net tonnage)	1.51 USD
Entrance/exit of ships in ballast	Ton (Net tonnage)	0.83 USD
Transiting the mouth of Sulina canal one way (entrance or exit), choose an alternative route via Romanian ports	Ton (Net tonnage)	2.34 USD

Source: AFDJ

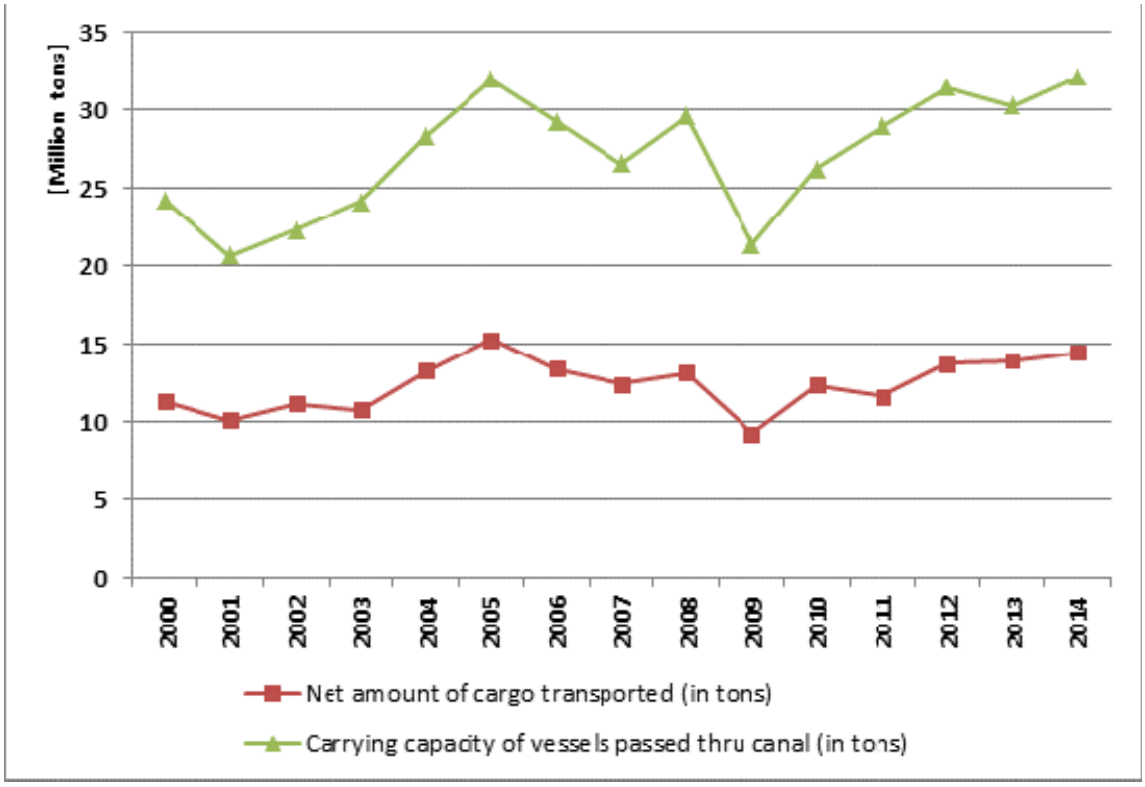
4.2 THE DANUBE-BLACK SEA CANAL

Key findings

- *The Danube-Black Sea Canal is the most used connection between the Danube and the sea and it is in Romania territory out of the river delta.*
- *Over the last few years the canal carries 80 to 90% of the Danube maritime traffic.*

The Danube-Black Sea Canal (also known as Cernavoda-Constanta) is the most important transport route in the region. It is located outside the delta and provides the shortest connections between the Danube and the sea. According to UNECE Blue Book (2006), the Danube-Black Sea Canal is classified as category VIc: the maximum length of a single vessel (unit) is 138.3 m and width is 16.8 m. For convoys the maximum length is 296 m, maximum width is 2.5 m, while the maximum draught is 5.5 m.

Figure 11: Transport volumes through the Danube-Black Sea Canal



Source: Administration of the Navigable Canals

Figure 11 shows transport cargo shipping trends and is based on available statistical data provided by the Canal operator, the Administration of the Navigable Canals (ACN). 2009 shows

a significant drop in cargo transported and vessels' carrying capacity which can clearly be associated to the global economic crisis; since then levels have recovered to pre-crisis values. Additional figures are available on the total number of vessels passing through the Danube-Black Sea Canal in 2012, 2013 and 2014, which were 24,212, 22,170 and 23,636 respectively.

The current capacity of the Danube-Black Sea Canal is approximately 64 Million tons per year. Ongoing rehabilitation works of the canal locks will be finished within 3 years, which will provide an increase in capacity of up to 80 Million tons per year.

Table 6 -: Statistical data about transport volumes on the Danube-Black Sea Canal

Year	Net cargo transport (in tons)	Vessels' carrying capacity (in tons)
2000	11,299,386	24,189,044
2001	10,128,690	20,628,674
2002	11,162,550	22,276,966
2003	10,776,299	24,146,839
2004	13,265,911	28,380,358
2005	15,319,144	31,965,103
2006	13,399,664	29,269,203
2007	12,420,911	26,587,991
2008	13,137,552	29,626,021
2009	9,270,733	21,390,592
2010	12,358,349	26,217,926
2011	11,615,169	28,978,606
2012	13,722,161	31,481,934
2013	13,966,043	30,291,055
2014	14,432,944	32,095,995

Source: Administration of the Navigable Canals

Transport tariffs on the Canal are as follows:

- Canal transit tariffs for barges in convoy and river vessels – 0.27 EUR/ton capacity
- Maritime vessels 2.49 EUR/NT (net tonnage)
- Technical vessels 1.70 EUR/LBD (length, breadth, depth)
- Passenger ships 0.28 EUR/ LBD (length, breadth, depth)
- Pushers and tugs 0.23 EUR/HP (horse power)

Tariffs are increased by an extra 20% for vessels carrying flammable goods or environmentally hazardous goods and are decreased by 25% for empty vessels. The minimum tariff for transit on the canal with lockage is 261 EUR and without lockage it is 170 EUR. All tariffs are charged without VAT.

4.3 THE DISTRIBUTION OF TRAFFIC AMONG THE CANALS

Key findings

- *The current distribution of maritime traffic in the Danube delta is strongly in favour of the Sulina canal.*
- *Data from the Ukraine administration shows that Sulina canal attracts ships of bigger dimensions, while the Bystroe canal is used only by smaller ships with shorter draught.*
- *The historic data show that in the year 2010 the Sulina and Bystroe canals were nearly equivalent in terms of number of vessels. However, in terms of tonnage, Sulina has always been dominant.*

The official figures of the Danube Commission (2013) in Table 7, show a comparison of goods in transit between the Kiliya arm, the Sulina canal and the Danube-Black Sea canal. These figures make it apparent that today the Bystroe route has a minor role in comparison to the Sulina canal.

Table 7 - Transport of goods through the Danube-Black Sea waterways (2013)

Variable	Kiliya arm (Bystroe)	Sulina canal	Danube-Black Sea Canal
Cargo transported [t]	732,000	3,168,339	13,966,043
Percentage	4%	18%	78%

Source: Danube Commission, 2013

From the available information on the Bystroe canal, no inference can be made as to navigation development and/or its performance. Interviews conducted in Ukraine only provided details of the number of vessels passing through the Bystroe canal for the period 2007 - 2015. Table 8 shows the traffic through the Bystroe canal over the period 2008-2014[2], compared to Sulina canal and Danube-Black Sea canal.

[2] *Available data for 2007 and 2015 does not cover the entire calendar year. There was no data obtained/available about transport performed in terms of tons-km.*

Table 8 - Traffic passing through the Danube delta maritime links for the period 2008-2014 [vessels]

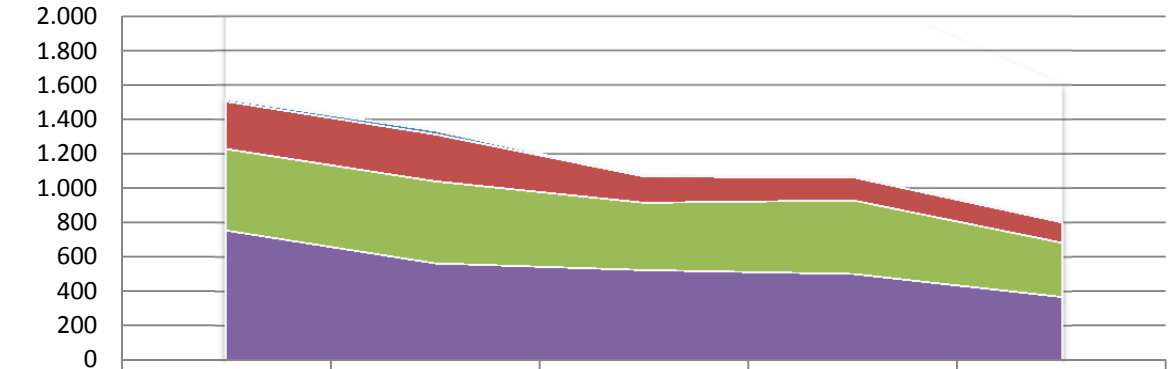
Link	2008	2009	2010	2011	2012	2013	2014
Bystroe *	1,245	1,413	1,522	1,339	1,072	1,068	805
Sulina Canal* -**	1,461	1,346	1,541	1,672	1,467	1,739	1,900
Danube-Black Sea Canal **	20,777	17,116	19,776	20,775	22,890	22,153	23,640

*Source: * Ukrainian Ministry of Transport*
*** Administration of the Navigable Canals (ACN)*
**** Galati Lower Danube River Administration (AFDJ) - maritime vessels only, inland not included*

It is clear that the Bystroe share of the total number of vessels going from Danube to the Black Sea is low. However, when restricting the analysis to the delta Region, it is evident that in 2010 the Sulina and Bystroe routes carried almost the same number of vessels and in 2009 more ships sailed through Bystroe in comparison to Sulina. This is a clear indication that, when it was sufficient deep for navigation, the Bystroe canal was a viable option for a large number of ships.

Comparison between the two canals (based on data provided by the Ukrainian Administration) can be expanded to consider the dimension of ships (based on their draught) and it emerges clearly that Sulina attracts ships of bigger dimensions (see Table 10), while Bystroe (see Table 9) is preferred by ships with shorter draught. In addition, the data shows that the Bystroe canal was mostly used by small and/or empty ships i.e. it was chosen as a cheaper route thanks to lower depth requirements. After 2010 the revision of tariffs on Sulina (including at the same time entrance and exit) favoured a shift to that canal also for ships traveling empty in one direction.

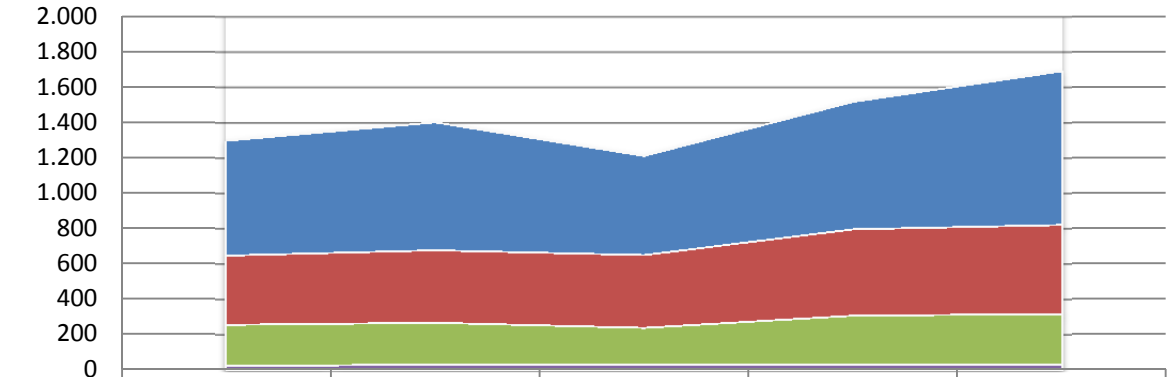
Table 9 - Number of ships sailing through Bystroe canal (ships/year by max. draught)



	2010	2011	2012	2013	2014
Total	1522	1339	1072	1068	805
≥ 5,0 m	13	22	0	0	0
≥ 4,0 m	277	273	153	134	119
≥ 3,0 m	474	477	392	428	315
< 3,0 m	758	567	527	505	371

Source: TRT elaboration on Ukrainian MoT

Table 10 - Number of ships sailing through Sulina canal (ships/year by max. draught)



	2010	2011	2012	2013	2014
Total	1301	1405	1214	1521	1695
≥ 5,0 m	651	725	561	722	871
≥ 4,0 m	392	410	412	489	504
≥ 3,0 m	234	236	208	276	290
< 3,0 m	24	34	33	34	30

Source: TRT elaboration on Ukrainian MoT

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 NAVIGATION ON THE DANUBE DELTA

Key findings

- *Maritime traffic on the Danube delta is steady.*
- *The two canals compete for the same traffic; when the Bystroe canal (Phase I) was fully operational the number of vessels (not the tonnage), were almost equal to those on the Sulina canal.*
- *Both Sulina and Bystroe canals need public subsidies in order to remain operational.*
- *Joint navigation management of the two canals would bring benefits to both sides.*

5.1.1 THE TRAFFIC IN THE BYSTROE CANAL AND KYLIA ARM

The level of traffic on the Bystroe canal in the Ukraine maritime sector is minor. Data shows that in the years of maximum exploitation - 2009 and 2010 - around 1,000 - 1,200 ships sailed through the canal. However, in terms of load, the annual traffic running through the Bystroe canal in that same period amounted to just more than 1 million tons per year and today it is around 0.7 million tons per year (Danube Commission data).

The total tonnage of the Ukrainian ports of Reni and Izmail amounts to 5.4 million tons in 2013, slightly more in 2014, with another increase expected in 2015. Out of this, about one fourth is maritime traffic and the rest is river traffic bound for internal regions, which does not cross the Danube delta.

5.1.2 TRAFFIC ON THE DANUBE DELTA

When considering all traffic between the Black Sea and the Danube, the majority uses the Romanian Danube Black Sea canal (Cernavoda-Constanta). This is an artificial canal with depths of up to 7 m that bypasses the delta. The annual traffic through the canal is approximately 14 million tons which is in contrast to less than 4 million tons travelling through the delta.

Within the delta, the Sulina canal is the principal maritime entrance which is governed by the Belgrade Convention. Like Cernavoda-Constanta, the Sulina canal falls within Romanian territory. The Bystroe canal, which lies outside Romania, provides an alternative route connecting the Danube to the Black Sea. Historical data shows that the route was used in the

1950's with similar volumes seen on the Sulina canal during the same period (when Cernavoda – Constanta was not constructed yet).

Overall maritime navigation volumes in the delta were quite steady over the period considered, then, due to the less favourable conditions in the Bystroe canal, the distribution of traffic has favoured the Sulina route since 2010. Today the Ukrainian canal is used only by small vessels with a water draught of around 3 m. Historical data shows that when Phase I was fully deployed the Bystroe canal was able to attract a number of vesselsc comparable to the Sulina, thanks to the lower tariffs and pilotage cost that were levied and to the possibility to operate day and night.

The Bystroe canal Phase II project, which would improve its navigation standards to those of the Sulina canal which, would probably bring about a rise in traffic in favour of Bystroe.

5.1.3 COOPERATION ON THE DANUBE DELTA

Today, despite a Bilateral Agreement proposing collaboration between Romania and Ukraine, joint research activities and monitoring of the environmental status of the delta has been minimal. In spite of the written and verbal intentions to cooperate, there is no discernible evidence of joint efforts have been made. The incompatibility of the respective positions on the Bystroe canal project has certainly not helped to improve cooperation.

The Danube delta region represents an important resource for both countries from an environmental point of view and a touristic attraction. It also has economic benefits for fishing industry and as an entrance to one of the most important navigable rivers in Europe. Limitation of the environmental impacts of navigation, conservation of natural resources and biodiversity should all be of interest of both parties so the opportunity to develop the delta's economy through joint activities and cooperation should be taken.

It should be pointed out here that, taking into account the maintenance costs of dredging activities, compensation and mitigating measures, etc., the economic sustainability of both routes is highly, questionable. given the limited traffic, both navigation canals need public subsidies to remain operational. In these circumstances, with a significant overcapacity, competition could only trigger a downward spiral.

Joint management of the navigation operations, and definition of specific roles for each of the two routes (e.g. one used by bigger vessels and the other by smaller vessels), together with reciprocal agreements on rights of navigation, tariffs and allocation of maintenance and mitigation costs, would improve the quality of the Danube delta conservation and bring about constructive cooperation between the two countries, this benefiting both economies.

5.2 THE ENVIRONMENTAL IMPACTS OF THE BYSTROE CANAL

Key findings

- *Ukraine failed to follow the Espoo Convention prescription with regard to the Bystroe canal design and works and the selection of alternative options and consultation were not carried out in the most transparent way.*
- *The transboundary impacts of the Bystroe canal dredging and maintenance are not clear though are suspected to be minimal.*
- *Mitigation and compensation measures were suggested in official documents but it is not clear how many were actually executed.*
- *Regular maintenance works are necessary to keep the Danube delta canals operational.*
- *Works have occurred on both the Kiliya arm and the Sulina canal in the last few years but monitoring of impacts was not done on either sides.*

5.2.1 DESIGN AND CONSTRUCTION OF THE BYSTROE CANAL

Phase I of the Bystroe canal project involved spot dredging activities in some rifts along the Kiliya arm, the deepening of the Bystroe mouth on the Black Sea and the construction of a breakwater dam to protect the maritime access to the canal. These activities and maintenance works e.g. regular dredging, river bank stabilisation on the Danube delta, impact on the environment.

Different elements need to be considered in order to assess to what extent the process of decision, design and construction of the Phase I project adhered to current legislation and international environmental standards. Although the decision and permitting processes were carried out according to applicable Ukrainian legislation, there are three important issues to highlight:

- Even though the environmental assessment can be considered a professional document that pays regard to the Ukrainian law provisions, NGOs raised concerns that, with a view to it being such a highly sensitive area, neither the analysis of possible alternatives nor the consultation process were carried out in the most transparent way.
- Even though the Espoo convention was already ratified under national legislation, Ukraine failed to inform or invite the neighbouring Romania to take part in the decision making and permitting processes. This was seen to be the major weakness of the project internationally.

- There is no clear evidence of proper monitoring of the impacts during execution of works. Mitigation and compensation measures are well documented but there is still no clear evidence of what measures were actually carried out.

5.2.2 TRANSBOUNDARY IMPACTS

Romania's compliant procedure instigated under the Espoo Convention resulted in the Report on the Likely Significant Adverse Transboundary Impacts of the Danube-Black Sea Navigation Route at the Border of Romanian and Ukraine in 2006. Ukraine has since carried out a revised Environmental Impact Assessment. More recently, Ukraine put in place a comprehensive monitoring programme and proposed a revision of its legislation in the field: thus the country is now in the position to comply with all its obligations.

Results of the transboundary impact monitoring provided by the two countries are contradictory. Ten years after Phase I of the Bystroe canal was completed, there is no clear evidence of any transboundary impact, apart from transitory restrictions in certain areas, that fall outside limits of environmental tolerance. In other words, it is not considered to have any "direct impacting on the territory of neighbouring country".

5.2.3 ENVIRONMENTAL IMPACTS SINCE THE BYSTROE CANAL OPENED

The parties did not provide clear evidence of environmental conditions of the area both before or after the implementation of the project therefore any impact since the opening of the Bystroe canal cannot be accurately evaluated. Nevertheless, some observations can be made based on the available information:

- there are continual changes in the Danube delta environment and biodiversity which cannot be clearly attributed to the Bystroe project e.g. new alien species, modifications of arms' routes, changes in flow discharges, etc.
- almost ten years of navigation through the Bystroe canal Phase I will have resulted in some changes but they are neither visible nor quantifiable e.g. sturgeon populations and their habits, often cited as one of the most important environmental issues, do not appear to have suffered though, admittedly, the pre-existing situation cannot be fully assessed.
- changes in relative water flow and discharge between the various arms and mouths of the river are the result of long term processes, not just human activities.

5.2.4 THE POSSIBLE MITIGATION AND COMPENSATION MEASURES

Mitigation of environmental impacts is possible although we cannot clearly link single measures to specific impacts. A set of sophisticated mitigation measures were proposed, some of which were implemented on the Bystroe canal project. Relevant mitigation measures, selected from those listed in the studies, are:

- Financial compensation schemes to offset unavoidable damage to the environment e.g. financing the construction of a fish breeding farm.
- Compensation measures to offset damage and disturbance to bird colonies e.g. actions to improve the bird-sustaining capacity of adjacent areas[3].
- Compensation measures to offset any impact on ground-nesting bird colonies along the route e.g. building artificial floating islands which are expected to attract nesting tern species and some sandpiper species[4].

5.2.5 ENVIRONMENTAL IMPACTS OF CANAL MAINTENANCE

The Bystroe canal, as with any other navigable canal in the Danube delta, needs regular maintenance to reduce the effect of siltation and sedimentation of material. Problems along the route can be identified at the sea mouth of the canal and also in some spots on the Kiliya arm (about 11 - 12 points have already been identified along the river border between Romania and Ukraine).

Since the last re-opening of the canal to navigation in 2007, the sedimentation of materials along the Kiliya fairway route has led to a progressive reduction in condition along the whole route and the maintenance has been poor, due to lack of funding and agreement between the two countries.

As already stated above, while dredging has some environmental impact, it is necessary to keep the river arms navigable as the annual sedimentation rate in the Danube delta is very high.

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[3] *Restoring natural water regime and grass cover on Yermakiv Island; clearing the channel connecting the Vostochny Arm and Anankin Corner isle and the Rybachy Zholobok (Fishing Groove) Arm*

[4] *Floating islands should be fenced to provide adequate protection against a jackal species that has recently appeared in the Danube Biosphere Reserve that is known to eat birds and eggs and to be a good swimmer.*

Planning works carefully so they are implemented in a timely manner to avoid major impact is advised, e.g. dredging must stop during the sturgeon migration season to reduce any ill effect on their habitat. The impact of regular maintenance is normally local but, to avoid cross border impacts, agreement is needed on the wider effects of mitigation measures e.g. correct positioning of a dumping site in the Black Sea.

5.2.6 OTHER RECENT WORKS ON THE KILIYA ARM

Works on the Kiliya arm branches have been almost stopped in recent years which means that the navigation standards temporarily granted by Phase I are no longer suitable on some parts of the route.

According to Ukrainian statements, all works were stopped for two main reasons:

- International decision linked to the Espoo Convention application meant that Phase II was suspended and Phase I maintenance suffered because Bystroe was excluded from the international network.
- Dredging works on the Kiliya arm section that borders Romania and Ukraine can only be carried out under a bilateral agreement (one party should grant the permission to the other upon request) but Romania would not approve the works planned by Ukraine.

According to Romania, Ukraine stopped maintenance works due to lack of funds.

During the last few years the lower Kiliya arm has been maintained to the same standard of navigation level guaranteed by the Bystroe canal. Some works were carried out in the upper part of the Kiliya arm so that larger maritime vessels (with a water draught of up to 7.2 m) could reach Izmail via the Sulina canal.

5.2.7 RECENT WORKS ON THE ROMANIAN SIDE OF THE DELTA

Although the environmental impact of the works carried out on the Romanian side was not objectively analysed, documents and interviews indicated that works are regularly carried out on the Sulina canal in order to ensure it is navigable in line with prescribed standards.

Moreover, Romania is aware of the impact generated by works carried out on the Sulina canal in the past including dredging, straightening and dam protection and expansion to guarantee maritime access to the channel. Currently, as a consequence of both intense navigation and dredging maintenance, sturgeon populations no longer pass through this channel (on the Romanian side the preferred way is the Saint George canal) neither do birds nest in an area of approximately 10 km around the Sulina canal according to statements made by a NGO.

However, an assessment of the environmental impact of recent works has not been considered. Transboundary impacts were never mentioned, even though the straightening of both Sulina

and Saint George a long time ago have brought about increasing water flows discharged through the Romanian Tulcea branch and the corresponding reduction from the Kiliya arm.

5.3 UKRAINIAN LEGISLATION ON THE ENVIRONMENTAL SECTOR

Key findings

- *The legislation of Ukraine on public access to information is rather advanced.*
- *The most urgent and difficult problem in this sector is the lack of proper procedures for the Environmental Impact Assessment (EIA) and for the Strategic Environmental Assessment (SEA).*
- *In order to align itself to the EU standard, Ukraine is preparing a new legislative framework that should be approved before the end of 2015.*

A comprehensive analysis of the application of the Espoo and Aarhus Conventions can be found in the *Report on assessment of Implementation of the Convention on Access to Information, Public Participation in Decision Making and Access to justice in Environmental Matters (Aarhus Convention) and the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) in Ukraine* (EU, 2015).

Based on interviews, our conclusions on the current degree compliance of the Bystroe project to relevant legislation is summarised as follows.

- Ukrainian legislation on public access to information is rather advanced. Regarding the provision of information upon request, it does comply with the requirements of the Aarhus Convention and Directive 2003/4/EC so does not require significant revision. Certain amendments are required regarding dissemination and disclosure of environmental information that are regulated by the Law of Ukraine "On access to public information".
- The most urgent and difficult problem in this sector is the lack of proper procedures for the Environmental Impact Assessment (EIA). There is not Strategic Environmental Assessment guidance or legislation in place in Ukraine. There is room for significant improvement when it comes to public participation both in EIA and any decision making process on plans and programmes that are likely to cause any environmental impacts.

Despite these deficiencies in the legislative framework, Ukraine has been able to carry out an environmental impact assessment within a transboundary context by applying the provisions of the 1991 UNECE Espoo Convention. This last is compatible with Article 9 of the Constitution of Ukraine. On 2 April 2008 the Government of Ukraine established the Interagency Coordinating

Council, chaired by the Minister of Environment, in order to implement of the Espoo Convention

The document *Final Decision on the Implementation of the Full-Scale Phase of the Danube-Black Sea Navigation Route Project in the Ukrainian Part of the Danube delta* prepared in 2009[5] establishes that there were no legal obstacles to drawing up a comprehensive assessment regarding transboundary impact to meet the international obligations (Espoo and related EIA, Aarhus). The document contains many replies as well as data and information in response to objections raised during the planning and implementation of Phase I. The document also acknowledges the concerns expressed in the Espoo Inquiry Commission Report (2006).

In order to comply with the Espoo Commission's recommendations and the Association Agreement signed between Ukraine and the EU, Ukraine is now working on a new legislative framework.

With respect to Directive 2011/92[6], the Ministry of the Ecology and Natural Resources has developed an implementation plan, which was approved by the Cabinet of Ministers of Ukraine in April 2015, in order to bring legislation in line with the provisions of the Directive and apply them in practice. The implementation plan should mean:

- adoption of national legislation and designation of competent authorities;
- establishment of project requirements which will be subject to an environmental impact assessment and of a procedure to decide which projects require EIA;
- clarification of the information to be provided by the developer;
- establishment of a procedure for consultation with environmental authorities and a public consultation process;
- agreement with neighbouring countries for exchange of information and consultation;
- establishment of how the general public will be informed as to be the outcome of decisions on applications for development consent.

[5] *Volume 2, Assessment of Likely Transboundary Environmental Impacts (EIA) of the Danube – Black Sea Navigation Route in Ukrainian Part of the Danube delta, Annex to the EIA Report Produced as Part of the Detailed Design Documentation for Full-Scale Development Phase of the Danube – Black Sea Navigation Route Project in the Ukrainian Part of Danube delta,* updated *to Take Account of Comments Expressed by Romanian Party on the Transboundary EIA for the Project (Articles 3.8 and 2.4 of the Espoo Convention) and Outcomes of Bilateral Consultations (Article 5 of the Espoo Convention)*

[6] *Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment*

The main objective is the development of the new legislation to establish clear requirements for the EIA procedure, including cases of transboundary impact, and amending relevant legislation to permit adoption of new statutes.

According to the implementation plan, and interviews with the Ministry of Ecology of Ukraine draft legislation was ready in June 2015 while the new statutes identifying objects and types of activity subject to EIA pursuant to Annexes I - III of the Directive is to be approved. A number of by-laws are expected to be ratified within six months following approval of the new legislation in order to make it applicable.

The implementation plan includes measures such as the establishment and maintenance of the data bases (registries) of EIA documents, establishment of the registry of experts in EIA and public participation, preparation of a guidance manual on the EIA procedure for the relevant parties (public authorities, NGOs, business, etc.) including the procedures in case of transboundary EIA and a series of related training activities. In addition, from 2015 - 2016 it envisages the development of bilateral and multilateral agreements on the transboundary EIA pilot project with an EU Member State.

5.4 POSSIBLE INCLUSION OF THE BYSTROE CANAL WITHIN THE TEN-T EAP STRATEGIC IWW NETWORK

Key findings

- *The economic impact of the inclusion of the Bystroe canal in the TEN-T EaP strategic inland waterway network would be at local level only.*
- *From the transport point of view, the Bystroe canal would offer a competitive alternative route over the Sulina canal.*
- *The inclusion of the Bystroe canal in the TEN-T EaP strategic inland waterway network would guarantee Ukraine's access to the Danube.*

Looking at the traffic flows, any financial gains that came about due to the inclusion of the Bystroe canal in the TEN-T EaP strategic inland waterway network are likely to be limited to a local rather than the strategic level. More specifically, assuming that the Bystroe canal would be at Phase I project standard:

- If it is not combined with other policies and investments, volume of traffic in the delta would not increase significantly. It is more likely to be redistributed amongst the alternative routes so there may be a minor shift of traffic from Romanian to Ukrainian

ports which could be mainly attributed to lower tariffs costs for those small ships calling at Reni and Izmail.

- Economic impacts would mostly be on a local scale. Whilst a reduction in transport time and cost could be said to be an economic and competitive gain so improving accessibility to the corresponding internal areas, it is also true that the traffic crossing the Danube delta represents only a small percentage of all maritime transport between the Black Sea and the Danube. Therefore, the economic effect would be limited to local areas, such as the Izmail region, which is currently suffering economically.

If Phase II of the Bystroe canal project is completed, the impacts would be more obvious as the canal would become a viable alternative, both in time and costs, for all maritime traffic entering the delta. However, this would require considerable additional investment and maintenance costs that might be difficult to justify from an economic point of view.

Including the Bystroe canal and Kiliya arm in the Eastern Partnership strategic network would mean that Ukraine would have its own maritime connection to the Danube river.

5.5 STUDY RECOMMENDATIONS

What is apparent from the study is that the Danube delta is a highly integrated system both from environmental and accessibility points of view. National boundaries are not relevant to its functioning. Recognising this fact is the only realistic starting point for a bilateral approach to reach a solution where both countries, the environment and inland navigation will all benefit. This coincides with recommendations made by the Espoo Commission in 2006 and suggestions proposed from the WWF and the outcome of the recent Ukrainian-Romanian consultation on 5 March 2015.

From the environmental point of view, the analysis highlights that the Danube delta must be considered as a single system where natural processes and anthropogenic factors do impact the entire river delta. This evidence calls for a shared approach that goes beyond the individual country boundaries. This is necessary for both monitoring (particularly for sturgeon' migrations) and for the mitigation measures that must be designed and implemented with considering for the entire delta system rather than a single area, so to avoid also minor transboundary impacts.

Looking at delta accessibility for maritime navigation, once again a shared approach is the most promising option. Traffic flow trends show that when the Bystroe canal was fully operable at the designed depth from 2008 - 2010 maritime vessels were using both routes according to their needs which brought economic benefits to the trades. A coopetitive approach where both routes contribute towards access to the inland ports, based on a fair and transparent shared tariff system, will increase the likelihood of guaranteed navigation levels in the delta and increasing traffic volume.

The following steps are suggested:

- Romania and Ukraine improve cooperation to better manage the Danube delta. This solution, which may not appear likely given the current dispute on the Bystroe project between the two parties, is the option suggested by several NGOs. Joint management of existing routes should include sharing of revenues, joint service provisions, common maintenance activities etc. and should aim for natural preservation and economic development of the delta and its resources.
- Romania and Ukraine launch joint environmental monitoring activities. As suggested also by the Espoo committee, monitoring should be based on regular planned funding from both parties and common methodology exchanged between scientific research institutes from the two countries. Particular focus should be on sturgeon migrations, habits, population census etc. throughout the entire Danube delta covering all migration routes simultaneously and using the same methodology.
- Provided that adequate mitigation measures are implemented, Romania allows completion of the Phase I project. Following many years without maintenance, further large dredging works would be necessary to bring the Bystroe canal and the Kiliya arm depths to the design standard (5.85 m of water draught allowed). At the same time, the Espoo inquiry commission would recognise the steps made by Ukraine to fulfil its recommendations and update its legislation.
- Ukraine accepts that work on the Phase II project should be stopped for a minimum of 5 years and accelerates alignment of environmental legislation in line with European standards. If, after this grace period, Ukraine still intends to deploy Phase II, it should be viewed as a new project so would need, according to updated national legislation, a new feasibility study carried out in accordance with the highest international standards and accompanied by a consultation phase both at national and international level. A new environmental impact assessment would also be required, which would have to take into account a thorough transboundary impact assessment.

These recommendations would bring benefit to all players:

- Ukraine will have its own access to the Danube whilst no longer going ahead with Phase II which could lead to disruptive competition with the Sulina canal;
- Romania, thanks to the limitation of the project to Phase I and new Ukrainian environmental legislation, will see both its environmental concerns and economic interests protected;
- Inland navigation on the Danube delta and river will be able to compete with other modes of surface transport;
- The Danube delta environment will, for the first time in over a century, be properly monitored, safeguarded and valued.

The recommendations to facilitate reconciliation between the two countries following ten years of disagreement are based on the following facts:

- ✓ *The Bystroe canal has re-opened a route already used in the past entirely within Ukrainian territory. The right of the country to exploit this route, provided it does not breach international rules and conventions (in particular on transboundary impact), should not be questioned.*
- ✓ *The opening of the Bystroe canal increases the attractiveness of the area as it offers a valid alternative route to the Sulina canal.*
- ✓ *As other works aimed at maintaining navigable depths in the Ukrainian part of the Danube delta, the Bystroe canal will slow down the current redistribution pattern of river flow in favour of the Tulcea branches in the Romanian territory.*
- ✓ *The Bystroe canal, like all other canal routes in the delta, is not sustainable from an economic point of view, due to the cost of frequent dredging maintenance works necessary to keep the route navigable. This suggests that tariffs should be fixed in a transparent manner to avoid distorted or unfair competition.*
- ✓ *The Phase I project has already been completed and the Bystroe canal is operating, although at a lower standard. In recent years only minor maintenance works have been carried out. The environmental transboundary impacts generated so far in the area do not appear to be of high amplitude.*
- ✓ *With respect to the international issue linked to the Espoo Convention, Ukraine is addressing its lack of legislative and procedural instruments that gave Romanian cause for complaint. The legislation alignment, part of the Association agreement signed between Ukraine and the EU is a pre-condition for any further project development and /or step for the solution of the international dispute.*
- ✓ *The monitoring of environmental impacts, together with legislative reform, should enable Ukraine to meet higher international standards and comply with mentioned conventions.*
- ✓ *Currently it does not seem worthwhile reconsidering alternative routes to the Bystroe canal. Although it is recognised by all stakeholders that crossing the Danube Biosphere Reserve is not the best option from the environmental point of view, works on the Bystroe canal had already been carried out so restoring the pre-existing situation would be nearly impossible.*
- ✓ *In all likelihood, maintaining the current status quo would not bring an end to the problem as the international issue linked to the transboundary impact assessment would remain unresolved.*

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