



Conveying expertise in coastal engineering to Bulgaria

Boyan Savov
Bulgaria

Three important events inform this paper: the 50-years anniversary of UNESCO-IHE, the accession of Bulgaria to the European Union, and the 10-years anniversary of the Black Sea Coastal Association. These milestones mark a period of fifteen years of personal experience, which I would like to share. The relationship developed with UNESCO-IHE and the Dutch coastal engineering community during this period has played an important role resulting in various long-lasting initiatives.

The Bulgarian Black Sea Coast covers the whole eastern bound of Bulgaria. Black Sea Coast beaches occupy approximately 130 km of the 378 km coast. The region is an important centre for tourism during the summer, drawing foreign and Bulgarian tourists alike and constituting the country's arguably most popular tourist destination, internationally known before 1989 as the Red Riviera. The largest city on the Bulgarian Black Sea Coast is Varna (also the third largest city in Bulgaria), located on the northern part of the coast. Another big city is Burgas, located on the southern coast.



A Black Sea beach close to Dyuni in Bulgaria

Cape Kaliakra

Besides the tourism, the development of the Bulgarian transport sector is expected to facilitate the economic and social development of the country by strengthening the connectivity between the industrial and rural cities, and also speeding up the country's integration into the European structural framework, by taking an advantage of its strategic location as one of EU's main gateways to the Black Sea.

Between science and practice

I started my career in 1980 as a design engineer at Geozashtita. This state-owned company deals with coastal and landslide protection on a national scale. After two years of design work, I won a place as research associate in the research section of Geozashtita. Already at that time, I realized there was a large gap between the research (called "science") and the coastal engineering practice. The scientists used to encapsulate themselves and their work was somewhat hidden and mystic for the rest of the engineers. It was almost impossible to link the research carried out with its practical purpose. This finding brought me some discomfort because my personal point of view is that applied research should serve the engineering practice. I went to analyze this even deeper when in 1987 I got a second assignment to act as a quality assurance engineer for the designing department.

I worked with younger colleagues who just graduated as hydraulic engineers having no training in coastal engineering. My experience at that time was not great either. Those colleagues were eager to do the job right and they were coming to me with plenty of questions. Many times, I was not able to answer, so I felt placed in the gap between science and practice.

My studies at IHE

In 1990, I had the chance to attend the 22nd International Conference on Coastal Engineering (ICCE) in Delft. It was a turning point in my professional life and the beginning of my relationship with Dutch coastal engineers and coastal engineering.

I also made a more realistic self-assessment and realized that some specialized training in coastal engineering would be very helpful for me. Henk Jan Verhagen, who was my host during the conference, advised me about the courses at IHE and I decided to apply. The overall situation in Bulgaria at that time was so bad that it was not possible to attend the course without financial support. Although academically admitted, NFP-fellowships for Bulgarians were not available, so my attendance was not possible. I was advised that special fellowships might become available in the near future.

I had already left the state job and attempted different approaches to survive as a freelance consultant. It was a time full of emotions and excitement because of the political change, though very challenging and even tough with respect to professional realization. When the old political system collapsed in 1989, the financing of the national program for coastal and landslide protection works was cut. It was clear to me that remaining at the state company has no future. As some new private businesses based on – something missing? the use of the coastal resources started to emerge, it looked as if in a short while there would be more work for

consultants in the field of hydraulic engineering. This forecast was too optimistic, probably inspired by the expectation of fast positive development. In reality, the period of 7 to 8 years that followed was full of political fights, a breakdown of the country's economy, and flourishing corruption. The country had to pull through this illness.

Being busy with everyday problems, I almost forgot about my application to IHE, however the administration of the institute did not and kept their promise to advise me on any possibility to get a special fellowship, which resulted in an opportunity in 1993.

That is how in the spring of 1993 I had to decide, whether I would participate in the international coastal engineering course. I realized that my absence for one year would result in loss of position on the market, but I believed that I would win with this training. Theoretically, this way of thinking was correct, but in practice, it proved not to be that simple. The question was who will recognize you as a qualified engineer or in other words is this extra qualification now really required? However, these thoughts came later.

All the doubts disappeared when the course started. The 11 months at IHE were remarkable and formed the most exciting period of my life. The contact with top professionals in the field of hydraulic and coastal engineering as well as with fellow participants, and the overall atmosphere at the institute made the stay very fruitful and highly enjoyable.



Class 1993-1994 Coastal and Port Engineering together with the guest-lecturers of the IADC-dredging seminar in front of the building Oude Delft 95

At the end of my study in Delft, I had to make an important decision regarding my further career. I decided to return to my work as a consultant, but I was also offered to represent Ballast Nedam Dredging Company in Bulgaria. This did not look

very promising as the dredging market in Bulgaria is too small, but on the other hand, it was a good chance to strengthen my relationship with the Dutch engineering society.



Fieldtrip: returning from a visit to the trailing suction hopper dredger 'Geopotes 14' (in the background), which executed maintenance dredging in the entrance to the Port of Rotterdam.

Studying abroad means that besides gaining particular skills, one can acquire attitudes. It is normal for someone to accept things that are more pragmatic and that would help to improve someone's performance. Such a change, positive in general, could however appear in conflict with the environment at home. Returning to Bulgaria I was faced with such a dilemma. It was difficult to communicate professionally in a common language. I looked around and I found myself alone. I realized that only very few Bulgarians had studied at IHE and I was the first (and so far the only one) in the Course of Coastal Engineering. This was a clue towards the positive impact IHE had on me, but also an indication of a problem that needs a solution. It is not possible to understand the problem without a short retrospective.

Status Quo of Coastal Protection and Coastal Engineering in Bulgaria

It is interesting to go back some 17 years ago and look at archives just after the political changes in Bulgaria. A number of local administrators and leading scientists were interviewed about the

Bulgarian Coastal Strategy, which at that time was based on the "hard" (structural) approach. There were different opinions on this issue. Scientists against the hard coastal protection have expressed a lot of criticism, while administrators believed that the structural measures were effective and successful. It is obvious there was a precipice between what in general is called science and the decision making process. A few of the statements published in "Coastal Protection and Long-term stabilisation of the Bulgarian Black Sea Coast" (Jordan Marinski at all) are cited below:

- Prof. L. Nikiforov, Head of Department Geomorphology at the Moscow University, 1989:"I have very sad impression of your wonderful coast, which people conscious or unconscious diligently destroy. They destroy beaches, while wasting millions for building useless, even harmful structures. This is an attempt to protect the coast by applying methods, which disregard any scientific approach".



Many similar structures can be found along the Bulgarian coast, all dating from the same period (1960s to 1980s).

- Prof. P. Kaplin, Chairman of the Working Group on the problems of the World Ocean, the Russian Academy of Science, 1989 : “...so I consider the nowadays coastal strategy in Bulgaria as a wrong one. It is necessary to reconsider the methods for coastal protection presently used”.
- Mr. P. Petrov, Chief Expert at the Ministry of Regional Development and Construction, 1989: “Our Ministry is confident that the coastal protection has been carried out in the right direction. All structures built fulfil their role.”
- Western European Experts, after having made a study tour along the Bulgarian Black Sea Coast, 1993: “Your country must be a rich one if you attempt to turn the 400 km coastline in a harbour. (They stress the existence of too many structures, which are more typical for port areas).”

If we consider the above criticism to be well grounded, it must have been an indication of wrong decisions. To change the attitude of decision-makers however is a difficult process. Knowledge transfer and the proper training of younger generations is the only way to achieve improvement. The situation in the early nineties was a strong resistance on behalf of the conservative society against any change in the status quo.

The establishment of the Black Sea Coastal Association

Already during my studies in Delft I realized that the process of conveying knowledge and expertise in coastal engineering from Western Europe to my home country hardly takes place. At the end of my stay in Delft I started looking for potential partners to cooperate on coastal engineering projects in Bulgaria. I learned about Dutch mission in Bulgaria, which attempted to identify individuals and groups of scientists, engineers and decision makers in order to consolidate a local society to collaborate with on bilateral initiatives and projects. I learned also that a number of opportunities were missed due to the lack of good Bulgarian counterpart. At that

very moment the idea of establishing an entity that could efficiently act as a counterpart to initiate and work on joint projects, crossed my mind for the first time.

It was in 1996 when Ronald de Heer announced the ‘6-weeks International Seminar on Port Management’ organized by IHE-Delft in close cooperation with the port authorities of Amsterdam and Rotterdam. I passed this information to Dr. Penchev, a colleague I new for quite some time already, and he attended the seminar. When he returned there were already two of us sharing the idea to create a bridge and foster cooperation in coastal and port engineering between Bulgaria and West European countries. The basic precondition for such undertaking is to create a core of professionals that would support these activities. This idea resulted in the establishment of the Black Sea Coastal Association in 1997.

The Black Sea Coastal Association during the course of ten years

BSCA was established in 1997 as an association of individuals aimed to provide coordination and professional expertise on different aspects of marine industry and coastal zone development, related to ports, as well as industrial, tourist, and other sites on the Black Sea coast.

BSCA exists already for ten years. During this period, the association has developed as an organization with individual and corporate members. The activities vary depending on the current problems of its members that need solutions. This process is determined by the ongoing political, economical and social changes that take place nowadays in Bulgaria. This is why the interest in membership in the BSCA varies with the time. At the beginning of the transition, because of the aspiration for democracy many NGOs were born. Due to lack of financing, many of them were trying to incorporate companies, which were expected to finance those organizations. In some cases (already sign of corruption) companies were ordered by politicians to provide funds to particular NGOs. This negative development was rather overwhelming for the fair businesses. It is also very discouraging for the fair NGOs which

practically can not compete with well supported financial creatures of businesses and politicians. This is why to establish and run an independent NGO is not an easy task. Our approach to overcome these problems was to rely on the increasing necessity for professional advice. This process is occurring, but still much too slow. The membership of Bulgaria in the EU is already a guarantee that the change is irreversible and the role of professional networks of the type we have developed will rapidly increase.

The country has seen a strong upward trend of cargo volume recently, having increased 2.4 times from 2000 to 2006. The trend is expected to continue, with an estimated cargo volume of 200 000 TEU in 2007 and 900 000 TEU in 2015, indicating that the present port capacity will become insufficient in the near future. This process is expected to have positive impact on the industries in the coastal zone with respect to recognizing the increasing importance of information and knowledge transfer as well as improvement of the qualification of their staff. As a result, we expect that the climate for our activities will become more favourable.

Sometimes we have observed the situation when a registered company member is rendering less support than a company which is not officially a member, but at the same time is cooperating very well with the association. We came to conclusion that we have to change the rules for membership. We are going to accept new rules at the General Assembly at the end of 2007. The new principle will be membership on an annual basis.

Main goals pursued by BSCA:

- to represent the interests of its members (corporations and individuals)
- to act as a pool of experts on the port and coastal zone problems
- to act as a catalyst for the exchange of information and expertise on different projects related to marine industry and sustainable coastal development
- to act as project coordinator
- to act as a bridge between administration and experts

- to generate initiatives and to act as a mediator between national, regional and international programs and organizations

Main activities of BSCA:

- exchange of information and expertise
- technical advisory
- collaborative research
- project management
- training
- publishing

The general goal of the association is to facilitate knowledge transfer partnerships in coastal and port engineering and coastal zone management. It was considered at the very beginning that contacts with UNESCO-IHE as well as with other organizations and individuals from Western Europe would be of utmost importance.

Projects and Activities involving Dutch-Bulgarian collaboration

The policy of BSCA is to pay special attention to scientific conferences and seminars, training activities, and participation in European projects on a regular basis. Permanent contacts with academic societies, prestigious consultancies, dredging contractors and professionals are an integral part of this policy.

International Conferences Port Development and Coastal Environment (PDCE), 1997, 2000, 2003, 2007

The first event organized by the BSCA was the international conference "Port Development and Coastal Environment", which took place in June 1997. As we had addressed the Dutch dredging industry, the European Dredging Association (EuDA) was present at the Conference. As a follow-up EuDA and BSCA prepared a joint proposal, that won a grant from the PHARE Programme for the organization of an International Training Seminar on Environmental Aspects of Port Development (EAPD'98). The attendance of Dutch participants in the above mentioned events is already a tradition.



Participants in the PDCE'03 on the beach



Round table discussion at the end of PDCE'03

Field Work in Coastal Engineering (FWCE)

During one of the PDCE conferences held in Varna (2000) there was a spontaneous discussion about the training of coastal engineers. The idea came from Henk Jan Verhagen who proposed to start fieldwork in coastal engineering, bringing together Dutch and Bulgarian students (possibly from other countries too). There are three parties involved: TU-Delft, the University of

Architecture, Civil Engineering and Geodesy, Sofia, and the Black Sea Coastal Association.

The first two academic institutions are supposed to take care of the field work program and students to participate, while the BSCA is appointed to provide logistical support (with the help of the companies- members) and equipment. The fieldwork started in 2002. Since then a total of 90 students (61 from TU Delft and 29 from the University of Architecture, civil engineering and geodesy) attended the fieldwork.

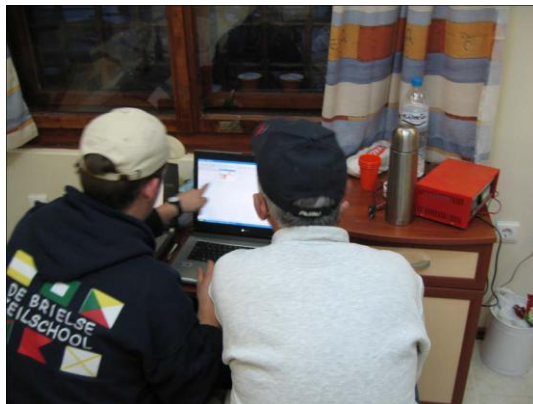


Hydrographic map at Byala elaborated during FWCE 2006

The fieldwork has been sponsored by known Dutch contractors, like Boskalis, Van Oord, and also supported by company-members of BSCA like “Eskana”, “Port of Varna”, “Ship Machine Building”. In the course of the fieldwork valuable field information is obtained for several locations along the Bulgarian Black Sea Coast.

Minor Graduation Project

In April 2005 the Black Sea Coastal Association (BSCA) has made the necessary arrangements to employ the TU students Floris de Bruijn and Christiaan Erdbrink as trainees to work on a current project Beach Improvement at the White Lagoon . BSCA provided accommodation and office space for the period of their stay (two months) as well as a small allowance.



The author and Floris de Bruijn, processing data at the site

The project was a success based on good collaboration and excellent performance by both Dutch students. The results and conclusions are important for the design of coastal engineering measures. Direct use of the results was regrettably obstructed by the decision of the developer not to proceed with improving the beach conditions. Nevertheless, the analytical part of the work done has applicability that is of a more general nature and goes beyond the scope of the project. For instance, the wind data processed, the sensitivity analysis for a number of parameters used in the UNIBEST model, etc.

An announcement for a second such a project is prepared. It concerns a port expansion project at the Lesport Terminal on the Varna Lake. Here a substantial investment in the construction of new quay walls as well as dredging and reclamation works is being studied.

Project Proposal: Environmentally Friendly Port and Coastal Structures (EFCOAST)

This project proposes the organisation of a series of conferences and training courses in the field of research and development of port and coastal structures with special attention on the “environmentally friendly approach”.

Main objectives of the project are:

- to provide a framework for exchange of advanced knowledge and experience in this field,
- to provide training to European researchers with up to 10 years of experience,
- to create a platform for introducing latest achievements of information technologies (such as CFD - Computational Fluid Dynamics simulations, virtual prototyping) in the field of research,
- to assist cooperation between research, policy and practice, between researchers, practitioners and decision makers.

The events will discuss problems falling within priority areas (environmental protection, coastal protection) identified in a number of EC documents and policies. It is important that these meetings take place in the forthcoming years, in order to respond to:

- new environmental conditions, related to global climate change, sea-level rise and increasing numbers of coastal disasters (flooding, storms, hurricanes, tsunamis).
- Specific challenges born by the Enlargement of the EU, the policies and directives of the EC related to Integrated Coastal Zone Management, including coastal protection, infrastructure development and involving environmental protection components to the highest degree.

The participants are:

- Black Sea Coastal Association (Bulgaria)
- Franzius-Institute for Hydraulic, Waterways (Germany)
- Delft University of Technology, (The Netherlands)
- UNESCO-IHE Institute for Water Education (The Netherlands)
- Aristotle University of Thessaloniki (Greece)
- DHI Water & Environment (Denmark)

The proposal was evaluated quite positively with a very high score (87.9 points out of 100, while the threshold is 70). Unfortunately, due to budget limitations our proposal fell below the line. Our

intention is to resubmit the proposal at the earliest possibility.

Proposal to participate in MyCOAST project

Resently BSCA was asked to inform its members about the invitation to participate in MyCOAST Project. The project will develop a vision and a strategy for the sustainable management of the Black Sea Coast. The initiative started with a seminar held in April 2005.

The Dutch-Bulgarian project team works together with the ministry of Regional development and Public Works (MRDPW), the ministry of Transport, the ministry of Environment and Water and the State Agency for Tourism and is supported by the Dutch ministry of Housing, Spatial Planning and Environment. The results of the MyCOAST project will be included in the plan for a national spatial scheme, and therefore this is an opportunity to take an active part in the long-term development of the Black Sea coast.



Dutch-Bulgarian seminar on sustainable development and integrated management of the Black Sea Coast

Conclusions

Lately, Bulgaria has undergone tremendous changes that affected the life of local people in different ways. In the course of these changes, it has been of vital importance for the businesses and individuals to find their proper place in the

changing environment. The coastal zone of Bulgaria was not an exception in this sense and has become an area of rapid development.

The dominating growth of tourism, along with urbanization, does not always go in (good) harmony with the environment. On the other hand, distorted environmental concerns and claims can seriously hamper projects for the modernization of existing industries, which in fact are aiming to improve their environmental performance.

It is high time to undertake measures to avoid conflicts and negative impacts and therefore the highest expertise in Coastal Engineering and Coastal Zone Management is necessary. Learning from the Dutch experience one naturally comes to the conclusion that the common (general) civil engineering background traditionally taught to students in Bulgaria is rather insufficient. There is no chair in Coastal Engineering in Bulgaria. There is only a short course in coastal engineering within the

Hydraulic Engineering programme at the University of Architecture, Civil Engineering and Geodesy in Sofia. Today's engineer must have gathered particular knowledge in Coastal Engineering. Skilled coastal engineers and managers are demanded at the state agencies and local administrations and therefore ongoing training initiatives must be further developed and be better incorporated in the bilateral cooperation.

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