

**REPORT OF THE
FOURTH MEETING OF DIRECTORS OF THE
NETWORK OF AQUACULTURE CENTRES IN
CENTRAL-EASTERN EUROPE**

Galați, Romania, 27-29 September 2007



**Edited by:
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Szarvas, 2008

MEETING REPORT**of the****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007**

1. The Research Institute for Fisheries, Aquaculture and Irrigation (HAKI), Szarvas, Hungary, as Coordinating Institution of the Network of Aquaculture Centers in Central-Eastern Europe (NACEE) organized the Fourth Meeting of NACEE Directors in Galați, Romania, between 27-29 September 2007. The Meeting was hosted by the “Dunărea de Jos” University, Galați, Romania and the Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture (ICDEAPA), Galați, Romania. The Meeting was partly supported by the Aquaculture Management and Conservation Service, FAO Fisheries and Aquaculture Department, Rome. The main objectives of the Meeting were to review the last year's progress of NACEE in general and its Working Groups in particular, to decide on relevant organizational, technical and financial issues, and to find ways to improve collaboration, with special regard to joint project activities. Particular emphasis was given to the development of project proposals and related fund-raising opportunities. The detailed programme and prospectus of the Meeting are included in Annex 1.
2. The Meeting was attended by 58 participants representing 37 institutions from 12 CEE countries, as well as by representatives of the European Commission (DG Fisheries and DG Research), FAO, NACA, EUROFISH and Ghent University, Belgium. Some representatives of the industry from Germany and Spain also attended the Meeting as observers (Annex 2 provides the list of participants).
3. The Meeting was opened by Mr Neculai Patriche, director of the Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture. After welcoming the participants and introducing the distinguished guests at the head table, he gave the floor to Mr Victor Cristea, representing the other host organization, the “Dunărea de Jos” University. Mr Cristea expressed his satisfaction that they could organize the Meeting in Galați, one of the most important fisheries and aquaculture centres in Romania, and his hope that the Meeting would help to achieve the targets set three years ago at the First Meeting of Directors of NACEE. Mr Patriche read the welcome letter from the Department of Fisheries of the “Dunărea de Jos” University of Galați to the participants, where the Meeting was placed in the historical context of the recent development of Romanian aquaculture, taking place after the sharp decline brought about by the political and economic transition.
4. Then the floor was given to Mr Gheorghe Stefan, President of the National Agency for Fisheries and Aquaculture under the Ministry of Agriculture and Regional Development of Romania, who gave an overview of aquaculture trends in Romania and the changes that had taken place since 1989. In his presentation, he listed the most important opportunities (e.g. globalization, increasing attention to issues like food security, food supply, quality control and creation of new jobs, reduced cost of aquaculture products, constant growth of the market demand for fresh fish, promotion of technical innovation) and problems (e.g. pollution, commercial aspects, decrease of costs with the increase of the production, high

prices for fish meals and feeds) of aquaculture in Romania. He also stressed the significant financial support to the development of aquaculture, inland fisheries, processing and commercialization provided by the European Fisheries Fund and Romania's national budget, which amounts to a total of 140 M EUR for the period 2007-2013. Half of this sum is allocated for aquaculture development.

5. Mr Ichiro Nomura, Assistant Director General, Fisheries and Aquaculture Department, FAO, praised the increasing international recognition of NACEE. He gave a short overview of the reasons and history of FAO's support to NACEE, stressing the need for NACEE-like organizations and their potential role in international collaboration and promotion of sustainable aquaculture development. He emphasized the importance of the communication between NACEE and national governments, and supported the idea of eventually turning NACEE into an intergovernmental organization. He confirmed continued support of FAO to NACEE, albeit pointing out that in the future, this support would focus more on strategic advice with less emphasis on financial assistance, as NACEE should gradually evolve into a self-sustaining, self-sufficient, economically independent organization. The full text of the speech is attached in Annex 3.
6. Finally, Laszlo Varadi (HAKI) greeted the participants on behalf of the NACEE Coordinating Institution, and wished them a successful and pleasant meeting.

PROGRESS REPORT AND FINANCIAL REPORT BY THE NACEE COORDINATING INSTITUTION

7. During the session, Mr Varadi presented the Progress Report and the Financial Report for 2006 and 2007 of HAKI, the Coordinating Institution of NACEE. Three major topics were touched in the Progress Report: (1) admission of a new member, the Interdepartmental Center of Protected Territories of the Belarusian State University, Minsk, Belarus, to NACEE; (2) participation of NACEE and its member institutions in EU projects; and (3) networking and exchange of information.
8. As the fiscal year 2007 is not over yet, the presented Financial Report was only preliminary, the final one will be sent to NACEE Directors in the beginning of 2008. Mr Varadi showed the negative balance of the 2006 due to the fact that several members had not paid their membership fees. The balance of 2007 is also negative, although it is mainly due to the increased international activity of the Coordinating Institution, which involved several travels abroad. Without these cost items, the membership fees are approximately sufficient to cover the organization-related costs of the Coordinating Institution. HAKI absorbed the excess costs both in year 2006 and in 2007. The Progress Report and the Financial Report (without the detailed budget tables) are attached in Annex 4.

REPORTS ON THE PROGRESS OF NACEE WORKING GROUPS

9. The discussion of the four Working Group progress reports was chaired by Mme Liliana Hadjinikolova (Institute of Fisheries and Aquaculture, Plovdiv, Bulgaria) and Mr Yuriy Pimenov (Astrakhan State Technical University, Astrakhan, Russia). Mme Lidiya Vasilyeva from the „BIOS” Research and Production Center for Sturgeon Breeding, the Lead Institution of the „Sturgeon Culture” Working Group gave a detailed overview of the research activities, material and human resources, status of the information exchange and the main problems making successful cooperation difficult. It was proposed to prepare a long-term cooperation programme among the Working Group members

including different forms of cooperation: (1) bi- and multilateral joint research programmes; (2) information exchange, with special regard to the establishment of a joint library on sturgeon culture; (3) participation in each other's programmes and organization of joint events; (4) exchange of biological material; and (5) joint publication of a catalogue of cultured species and hybrids of sturgeons. Mme Vasilyeva also presented a new report on the status and development perspectives of commodity sturgeon production in CEE, and the results of the latest research programme of BIOS that had ended with a public-awareness raising action of releasing large-size sturgeons into River Volga with the involvement of the President of the Russian Federation. The reports are available in Annex 5.1.

10. Mr Andrey Bogeruk (Federal Centre of Fish Genetics and Selection, the Lead Institution of the „Fish Genetics” Working Group) presented a report on the research activities performed by the WG members last year. Several further actions were proposed as well as two joint project proposals that the WG would like to submit in the following period. The full report is available in Annex 6.1.
11. Mr Varadi (Research Institute for Fisheries, Aquaculture and Irrigation, the Lead Institution of the „New and High Value Species” Working Group) described the potential and the problems of this field and summarized the activities of each of the four subgroups: (1) pikeperch and pike culture; (2) culture of coregonids; (3) culture of black carp; and (4) crayfish culture. European trends were analyzed and it was pointed out that species diversification remained an important issue of sustainable development of European aquaculture. Lessons were drawn for NACEE members and future actions proposed. The full report is attached in Annex 7.1.
12. Mr Branko Glamuzina (University of Dubrovnik, one of the two Lead Institutions of the „Aquaculture Education” Working Group), reviewed the progress done in the past year. He informed the participants on the two TEMPUS project proposals aiming at the development of common curricula in the West Balkan region and in the CIS. The proposals did not win support but will be resubmitted. Although their rejection had been a disappointment for the Lead Institution, it was pointed out during the ensuing discussion that the scores reached were indeed not bad, and therefore, the participants encouraged the Lead Institution to resubmit the proposal, possibly involving also Western European institutions. Mr Sergey Alymov (National Agricultural University, Kiev, Ukraine) informed the participants that NAU had agreements on mutually accepting each other's diplomas with some Western European universities and that they were ready for discussing such a scheme with UNIDU as well. Mr Glamuzina also clarified that the report presented by him represented only the Southern institutions within the Working Group (Croatia, Bosnia-Herzegovina, Czech Republic, Hungary and Montenegro). Unfortunately, Mr Konstantin Tylik from Kaliningrad State Technical University, the other Lead Institution of the Working Group, could not attend the Meeting. The full report presented by Mr Glamuzina is available in Annex 8.1.

SESSION ON THE STRATEGY OF AQUACULTURE DEVELOPMENT IN THE CEE REGION

13. The session was chaired by Mr Ihor Hrytsynyak (Institute of Fisheries of the Ukrainian Academy of Agricultural Sciences, Kiev, Ukraine) and Mr Branko Glamuzina (University of Dubrovnik, Croatia). The first speaker in the session was Mr Jean-Claude Cueff (DG Fish, Aquaculture Unit, European Commission). He informed the participants on the

strategy adopted by the Commission in 2002, which aimed to help the development of aquaculture in the Community. Most of the objectives set by the strategy have been achieved at Community level. The European Fisheries Fund adopted in 2006 provides for financial support to aquaculture by helping diversification of the production, enhancing the environment and favouring collective activities to ensure sustainable development of aquaculture. But the situation is not fully satisfactory if we consider that aquaculture in the Community does not sufficiently contribute to fill the growing gap between a steady demand for fish and the decline of wild resources. The Commission envisages to reconsider its strategy following the last enlargement, the need for increased supplies of fish and a growing concern about access to space and to markets. A conference is to be organised on 15-16 November 2007 following a wide and comprehensive consultation with stakeholders, which took place during summer. It should come up with a revised strategy in the course of 2008. A representative of NACEE will be invited to this conference. Any contribution from NACEE to help analysing the situation of aquaculture in the Community and in Eastern Europe and to contribute to its strategy would be most welcome.

14. In a presentation by Mr Bogeruk, a methodology was proposed for the elaboration of an aquaculture development strategy for the CEE region. He stressed that the regional focus is unavoidable while planning for sustainable aquaculture development due to several reasons: (1) similarity of environmental and climatic conditions; (2) location of aquaculture enterprises around major lakes and rivers shared by more countries; (3) neighbouring countries sharing the same cultured species and culture biotechnologies, and often using breeds developed by other countries; and (4) similarity of the socio-economic situation in neighbouring countries. A good strategy of aquaculture development should provide for: (1) efficient utilization of the natural resources of the given country or region; (2) adapting to external factors, especially to competition on the domestic, regional and world markets, and the competing claims to natural resources by other economic sectors; and (3) keeping the balance between creation of efficient vertical and horizontal structures, application of innovations and personnel training.
15. Mr Bogeruk evaluated and grouped CEE countries according to several parameters (environmental and climatic, socio-economic, aquaculture-related, etc.), and highlighted the significance of these groups in creating a regional aquaculture strategy. He also demonstrated that the fish consumption in virtually all CEE countries was significantly below the levels advised by nutritionists, which could be well correlated with the lower life expectancy in these countries. He suggested that a strategy of aquaculture development in the region should be based on the physiological fish consumption requirements and should set the long-term target value of the annual aquaculture production at 2.0-2.5 million tonnes for the next 20-25 years (a 10-fold increase compared to 2005).
16. In the next presentation, Mr Varadi put forward the ideas of the Coordinating Institution regarding a NACEE project proposal for technical assistance for the development of a sustainable aquaculture strategy for the NACEE region. He reminded that the need for an aquaculture development strategy for the NACEE region was raised during the 2nd NACEE Directors' Meeting in Astrakhan in 2005. Meanwhile, NACEE has been involved in various exercises that resulted in valuable information on the status and trends of aquaculture in the NACEE region. The coordinating institution of NACEE and its member institutions were involved in the elaboration of FAO NASOs (National Aquaculture Sector Overviews) and NALOs (National Aquaculture Legislation

Overviews), and a Regional Review of Aquaculture Status and Trends in Central and Eastern Europe for FAO, which should be published in the coming months. The information and data in these documents can be utilized well during the elaboration of the planned aquaculture development strategy for the NACEE region.

17. It was agreed that the work aiming at the elaboration of the strategy should be done through wide stakeholder consultation. The planned work may include the following elements:

- regional workshops (e.g. EU member countries; NIS countries; Western Balkan countries);
- joint workshop (with the involvement of experts of FAO, EU and other interested organizations);
- stakeholder communication (scientists, producers, government, consumers, service providers, media etc.);
- inter-regional communication (in particular between NACEE and NACA);
- generating new information, which at present is not readily available (e.g. market surveys);
- translation of existing materials from Russian to English;
- processing of relevant available documents (regional and others);
- processing the documents and findings of the workshops and visits;
- elaboration of the draft strategy;
- final conference (stakeholder involvement);
- finalization of the strategy;
- translation and dissemination.

18. An important question is how to finance the planned activities. FAO's Technical Cooperation Programme (TCP) may offer a possibility. However, project proposals in the FAO TCP scheme should be submitted by individual governments and there are also various criteria to be addressed and complied with. It was decided to establish an expert group (consisting of Messrs Glamuzina, Bogeruk, Bekh and Irnazarow) that would elaborate an action plan in order to prepare an appropriate project proposal for a FAO TCP project. Mr Barg confirmed that the TCP Guidelines had recently been revised and provided a copy to the Coordinating Institution. Additional information on FAO's TCP is available at FAO's website (http://www.fao.org/tc/tcp/index_en.asp).

19. It was advised during the discussion of the proposal that beside „conventional” donors such as FAO and EU, the funding possibilities provided by other alternative „non-conventional” donors could also be better explored. NACA is ready to share experiences and assist NACEE in this respect.

NEWS OF THE PARTNER ORGANIZATIONS

20. The session was chaired by Mr Patriche. Mr Sena De Silva, Director General of the Network of Aquaculture Centres in Asia-Pacific (NACA) described NACA's structure, R&D and human resource development activities by its members and NACA's publications.
21. Mr Sebastian Rodriguez, representing Eurofish, gave a short overview of the development of the organization since the last year. Eurofish has currently 12 member countries across Europe. Eurofish continues its focus on food safety, trade and markets as well as aquaculture. It is the ambition of the organization to increase its efforts in the field of aquaculture through its publication and project activities. Workshops planned for 2008 were also presented (Regional Baltic Aquaculture, Investments in CEE Fish Industry). In general, Eurofish is open to further co-operation with NACEE.
22. Mr Varadi informed the Board about a recent meeting with Mme Maria Kadlecikova, FAO Regional Representative for Europe and Central Asia in Budapest, during which the idea of a Sub-regional Aquaculture Conference was discussed. Such a sub-regional conference would be a good contribution to the development of the planned collaboration between NACEE and countries bordering on the NACEE region (Armenia, Azerbaijan, Georgia, Iran, Kazakhstan, Kyrgyzstan, Turkey, Turkmenistan and Uzbekistan). Mme Kadlecikova confirmed the willingness of FAO's Regional Office for Europe & Central Asia (REU) to co-organize the conference with NACEE and to discuss details with a representative of NACEE, including funding. The NACEE Board of Directors welcomed the idea of organising a NACEE-FAO/REU Sub-regional Aquaculture Conference in 2008 and appreciated the support of FAO/REU. HAKI, as the Coordinating Institution of NACEE, was requested to discuss details with FAO/REU, elaborate a proposal and send it to member institutions by the end of this year.
23. The establishment of a post for a Fisheries Officer in FAO's Regional Office (REU) in Budapest will provide additional opportunities for support and regular communication between HAKI and FAO, which then may contribute to the better collaboration between NACEE and FAO.
24. Mr Varadi, as President of the European Aquaculture Society (EAS) briefly introduced EAS to the participants. He presented the Thematic Groups of EAS (drawing special attention to the recently established Student Group), as well as the publications, projects and conferences of EAS. Among these, he especially emphasized the Aquaculture Europe conference to be held in Krakow, Poland, on 15-18 September 2008, encouraging all members to take part in this event. He also stressed that NACEE members were still under-represented in EAS, although the membership fee was moderate (and even lower for CEE countries) and it entitled members to significant reductions on WAS and EAS conferences and publications.
25. Mr Martin Scholten, the president of the European Fisheries and Aquaculture Research Organization (EFARO), could not participate in the NACEE Director's Meeting, but had provided a presentation on EFARO (including a proposal for a link with NACEE), which was introduced to the participants by Mr Varadi.
26. The Board agreed that there were many similarities between the objectives and activities of NACEE and EFARO and that the activities of the two organisations could complement each other well, taking into account that EFARO focused on marine aquaculture and covered Western, Northern and Southern Europe, while NACEE's focus was on

continental aquaculture in the Central and Eastern European region. The proposal of EFARO to link activities between the two organisations through a twinning arrangement and to mutually provide observer status for each other in the Board Meetings were welcomed by the NACEE Board of Directors. HAKI, as the Coordinating Institution of NACEE, was requested to continue communication with leaders of EFARO in order to establish a formal link between EFARO and NACEE.

SESSION ON CURRENT ISSUES OF RELEVANCE TO THE WHOLE NETWORK

27. The session was chaired by Mr Bogeruk and Mr Varadi. The discussion material compiled on the basis of the answers given by participants to the previously distributed questions was presented by Mr Peter Lengyel (HAKI). The discussions were grouped around six major topics: (1) joint projects; (2) structure of NACEE; (3) information exchange; (4) NACEE webpage; (5) foreign relations; and (6) terminology. The results of the discussions are summarized below.

28. **Joint projects:** The Board of Directors praised the decision of the Coordinating Institution to hold sessions on project preparation during the Meeting. There is a broad consensus among NACEE members that participation in FP7 projects should be increased. However, many Eastern European members do not have experience in preparing such proposals. The following general statements were formulated:

- Members should more actively investigate the available project opportunities themselves, while using the information, communication and networking possibilities provided by NACEE.
- The scheme of bi- and multilateral intergovernmental S&T programmes should be used more extensively. Members were requested to investigate with which countries their government had such agreements and provide this information to the Coordinating Institution by 30 November 2007.
- Whenever possible, joint projects should include support to more mobility of experts (with special regard to exchange of young professionals).

29. **Structure:** The issue of transforming NACEE into an intergovernmental organization has been raised several times during NACEE meetings and was identified as a long-term objective of NACEE. However, this process requires time and requires a previous consolidation of the Network.

- It was agreed that the first step toward attaining this objective should be informing (and regular updating) of the governments on NACEE. Members agreed to provide to the Coordinating Institution the addresses and names of contact persons of the government agencies in charge of aquaculture as well as the bodies supervising their own institutions. The NACEE Coordinating Institution was instructed to write information letters to the provided addresses.
- After informing the governments, the second step should be inviting government officials to the next NACEE Meeting. The invitation letters will be written and sent by the Coordinating Institution in advance of the Fifth Meeting.

During the discussion, it was also proposed to establish one more Working Group, that of Innovative Aquaculture Technologies. The need for such a group was recognized by

several members. The proposal was supported by the Board of Directors. Mr Ponomarev (Astrakhan State Technical University, Astrakhan, Russia) agreed to lead this task, and establish a small Working Group that would formulate specific Terms of Reference for this WG.

30. **Information exchange:** It was generally agreed that the information exchange needed to be further improved within the Network. The following specific actions were proposed:

- Reproducing technical FAO and EU documents on the status and development perspectives of aquaculture, possibly with short comments on possibilities of their application in the CEE region. Mr Uwe Barg (FAO) supported this initiative and encouraged NACEE members to use or adapt and update the documents published by FAO according to their needs.
- Informing the public both within and outside of the CEE region on the existence of NACEE, on its capacities and the possibilities of cooperation. Different tools can be used for this purpose: the NACEE webpage, the Eurofish Magazine, the Aquaculture Europe Magazine, the FAO Aquaculture Newsletter and different national journals. The Russian journal „Rybovodstvo i rybnoe khozyaystvo” (Fish Culture and Fisheries) is ready to devote a special issue to NACEE. Members agreed to provide information on national fisheries- and aquaculture-related journals in their countries and whether they were ready and willing to provide space to NACEE-related news or papers. The deadline for this task was set at 31 October 2007. The Coordinating Institution will then inform the members on these publication opportunities.
- Compiling annual plans of workshops, conferences and other events held by members and coordinating the dates with other events to avoid overlaps. The plan will be approved at the annual NACEE Meetings. Such a plan has been compiled by the Coordinating Institution for 2008 and distributed to all participants.

31. **NACEE webpage:** Most members agree that the role of the NACEE webpage in information exchange should be increased. It was pointed out that the scientific and technical potential of NACEE should be made more visible. It was suggested to publish the following materials on the NACEE site:

- a list of scientific and technical results that may be used in different countries;
- a list of innovation projects that could receive investments from state or private donors;
- information on activities, members and outputs by NACEE technical Working Groups, such as the four active WGs on sturgeon aquaculture, fish genomics, new & high value species, and aquaculture education. Dedicated sections on NACEE’s website should be developed for each of these WGs.
- a public searchable database on the professional potential of NACEE member institutions and their researchers (NACEE „who is who”): standard data format needs to be developed by HAKI and sent to the members for their approval. After the format is agreed upon, members should send their information to HAKI by 30 November 2007;
- regular or occasional information from NACEE members. A section called „News of NACEE members” could be opened on the site, or otherwise, a password-accessed

message board could be created where all members could post relevant information. The Coordinating Institution will decide on the format and send it to the members for their approval. Members are required to keep HAKI updated on their developments. To make this information regular, it is suggested that all institutions should send to HAKI their updates by the 10th day of every second month starting from 10 December 2007.

32. **Foreign relations:** The status of the countries bordering on the CEE region (e.g. Armenia, Azerbaijan, Georgia, Iran, Kyrgyzstan, Kazakhstan and Turkey) was discussed. Several NACEE members have received requests for membership from institutions in these countries. It had been agreed that NACEE could offer Associate Membership to interested institutions from these countries. Associate Membership would include invitations to interested institutions to join NACEE meetings or other events. Associate members do not pay membership fees and have no voting rights. Members were advised to inform the interested organizations on the possibility of Associated Membership in NACEE. If they need further information, they should be directed to the Coordinating Institution. They can also be informed on the cooperation possibilities with NACEE, with special regard to the NACEE-FAO/REU conference planned for year 2008.
33. **Terminology:** An intensive discussion took place on the status of aquaculture and whether it should be classified under Fisheries or Agriculture. It was pointed out by Mr Barg that while there was a real need for good definitions, such discussions could be virtually endless and that the specific purpose should be identified first in order to make the definition meaningful. He also drew the attention to the FAO glossary of aquaculture terms, the NALOs and other documents developed by FAO and available online. Recently, the FAO Coordinating Working Party on Aquaculture Statistics was established, and a first scoping meeting will be held in Bangkok during 8-10 January 2008.

SESSION ON THE SEVENTH FRAMEWORK PROGRAMME

34. The session was chaired by Mr Martin Kocour (Research Institute for Fish Culture and Hydrobiology, University of South Bohemia, Czech Republic) and Mr Zdzislaw Zakes (The Stanislaw Sakowicz Inland Fisheries Institute, Poland). The first speaker was Mr Mario Lopes dos Santos (EU DG Research), who gave a presentation on the aquaculture research within FP6. He explained the mechanisms and calls of the FP6 and listed several successful aquaculture-related projects. He particularly stressed the importance of dissemination activities, such as the Profet Programme, whose next meeting would take place in Warsaw, Poland on 13-14 December 2007. He pointed out the activity of aquaculture in FP6 projects and its successes, especially in support to SMEs.
35. The Eurocarp (Disease and Stress Resistant Common Carp: Combining Quantitative, Genomic, Proteomic and Immunological markers to identify high performance strains, families and individuals) project was presented by Mr Zsigmond Jeney (HAKI, Hungary), the project coordinator, as an example of a successful project proposal. Beside the technical information and achievements of the project, experience gained during formulating and implementing the project was introduced. The author gave an analysis of the “pre-conditions” of applying for the project. The existence of the live gene bank of common carp at HAKI, Szarvas, successfully implemented national projects, experience in formulating and running complex national projects, good working relations with Hungarian R&D institutions, measurable scientific results (international publications) and strong institutional background/backstopping were quoted as the major factors at national level. At the international level, experience in formulating and implementing complex

international projects and good working relations with international R&D institutions were named as the main factors/preconditions of the success. Mr Jeney informed the participants on the FVM/HAKI-CGIAR/WFC Workshop on Carp Genetics to be held in Szarvas, Hungary on 4-6 December 2007.

36. Mr Patrick Sorgeloos (Ghent University, Belgium) presented some experiences and opportunities for cooperation with Third World countries, with special regard to Asia. He introduced ASEM (Asian European Meeting) and its aquaculture platform and discussed the possibilities for NACEE to be involved in this work. During the discussion, it was realized that several NACEE members had cooperation programmes with developing countries in Asia and Africa, but they were open to new contacts as well.
37. Mr Lopes dos Santos presented FP7 with special regard to the changes compared to FP6 (e.g. management of aquaculture research by DG Research instead of DG Fish). He provided information on the work packages and outlined five different ways of NACEE's possible involvement in FP6: (1) as clients; (2) in identifying research priorities; (3) input for cross-cutting issues; (4) input to the Aberdeen Declaration and the Integrated Strategy for Marine Sciences in Europe; and (5) as a member of a new structure or network of marine sciences.
38. Members recognized the significant opportunities for developing joint NACEE projects which could possibly be proposed for support through FP7 and subsequent Framework Programmes. Mr Lopes dos Santos also encouraged NACEE to consider its possible role as an advisory body to DG RTD and DG FISH by developing strategic documentation on opportunities and needs for priority R&D initiatives in the field of aquaculture in the CEE region.
39. The participants also discussed questions on opportunities for support by FP7 to thematic research areas such as sturgeon breeding and farming, marine aquaculture, fish genetics, species diversification, support to capacity building efforts targeting human resource development and institutional strengthening, rehabilitation of existing aquaculture facilities (especially carp ponds), multi-functional, integrated, ecosystem-based fish farming systems. Specific reference was made to possibilities for strategic support to international RTD cooperation in aquaculture within the NACEE region as well as to research cooperation between NACEE and aquaculture institutions and experts in Africa, Asia, Latin America and the Caribbean.
40. The Meeting was informed of FP7 international cooperation mechanisms, in particular of Specific International Cooperation Actions (SICAs). SICAs aim at reinforcing the collaborative research capacity in non-associated and neighbourhood countries and at addressing the needs of developing and emerging economies by means of dedicated cooperative research in given thematic areas. SICAs appear to be particularly well-suited to NACEE's current RTD needs and membership of aquaculture institutions from both EU and non-EU countries. SICAs aim to facilitate international dialogue, communication, networking and mobility of RTD institutions and experts.
41. The Meeting recognized the opportunities SICAs might offer, especially for discussion of existing and future aquaculture research priorities of interest in both NACEE and Western European regions, and for development and implementation of targeted aquaculture RTD projects in response to future calls. NACEE Directors recommended immediate follow-up on these opportunities. NACEE Directors requested colleagues of the Coordinating Institution and the FAO Fisheries and Aquaculture Department to communicate with

senior experts at DG RTD and DG FISH with a view to explore and confirm opportunities for development of a SICA specifically targeting support to NACEE's RTD efforts and networking activities.

42. Mr Bogeruk invited Mr Lopes dos Santos and other EC colleagues to come to Moscow to conduct a training session on FP7 and other EU RTD support schemes. Mr Lopes dos Santos accepted the invitation. NACEE members will be invited to participate in the training session that will be organized for the end of January or the beginning of February 2008.
43. NACEE Directors recognized the opportunities and the need for a proactive and determined approach towards international cooperation and more commitment to joint project development and implementation.

CONCLUSIONS, RECOMMENDATIONS AND FOLLOW-UP ACTIVITIES

44. The session was chaired by Mr Povilas Kindurys (Lithuanian State Pisciculture and Fisheries Research Centre). The speaker was Mr Lengyel, who presented a detailed Action Plan showing the suggested activities broken down to specific tasks with set deadlines. The proposed tasks were accepted by the participants. The updated Action Plan is available in Annex 9.
45. The NACEE Meeting participants welcomed and unanimously accepted the generous offer by the Institute for Fisheries, Kiev, Ukraine, to host the Fifth Meeting of NACEE Directors. The Meeting agreed on the following dates and venue of the Fifth NACEE Directors' Meeting: 15-18 October 2008, Lviv, Ukraine. The Meeting also warmly welcomed and accepted the Polish institutions' offer to host the Sixth Meeting in 2009 in Poland.
46. A number of events were noted, including the Aquaculture Europe 2008 Conference in September 2008 in Krakow, Poland, and other conferences and workshops to be held in Belarus, Hungary, Poland, Russia, as well as outside of the NACEE region. Their list is provided in Annex 10. Upcoming events of interest will also be posted on the NACEE webpage.
47. Finally, it was agreed that more active participation by NACEE members was required. Currently, most of the work in NACEE is done by the Coordinating Institution and the Lead Centres of the Working Groups. Other institutions also should be involved in NACEE work in order to promote networking on all levels. Sharing responsibilities and stronger commitment by all members were confirmed as guiding principles for future collaboration.
48. Following the last plenary session, the four NACEE Working Groups organized ad-hoc meetings to determine the specific steps for collaboration in the next year. Summaries of the discussions and the produced documents are attached in Annexes 5.2, 6.2, 7.2 and 8.2.
49. At the end of the Meeting, two Romanian institutions expressed their wish to join NACEE. These are:
 - Research and Development Center for Fish Culture, Nucet, Romania
 - National Institute for Marine Research and Development "Grigore Antipa", Constanța, Romania

After briefly presenting their institutions, their admission to NACEE was voted on and accepted by the present members. This has increased the membership of NACEE to 41 institutions from 15 countries. The information sheets of the two new member institutions are attached in Annex 11.

DISCUSSION AND ADOPTION OF THE REPORT OF THE DIRECTORS' MEETING

50. The Report of the Fourth Meeting of NACEE Directors was revised, discussed and adopted by the participants on 29 September 2007. The final version of the report together with its Annexes will be published by HAKI and circulated among all interested parties.

PROSPECTUS**of the****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007**

The Research Institute for Fisheries, Aquaculture and Irrigation (HAKI), Szarvas, Hungary, as Coordinating Institution of the Network of Aquaculture Centres in Central-Eastern Europe will hold the Fourth Meeting of NACEE Directors in Galați, Romania between 27-29 September 2007. The meeting is hosted by the “Dunărea de Jos” University, Galați, Romania and the Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture (ICDEAPA), Galați, Romania. The meeting is partly supported by the Aquaculture Management and Conservation Service, FAO Fisheries and Aquaculture Department, Rome.

BACKGROUND AND RATIONALE

After its informal establishment in 2003, the Network was formally founded during the First Meeting of NACEE Directors (Szarvas, Hungary, November 2004), when directors and representatives of 23 institutions and organizations from 13 CEE countries signed a formal Founding Document and agreed on the structure and the operational framework of NACEE.

During the Second Meeting of NACEE Directors (Astrakhan, Russian Federation, September 2005) the network participants had laid down the operational and programmatic framework of their Network. Concrete steps were taken toward the development of joint project activities. NACEE Directors determined four priority areas for joint work, four respective Working Groups were formed, each coordinated by a Lead Centre responsible for the activities of the given Working Group. At its Third Meeting (Dubrovnik, Croatia, September 2006), NACEE had increased its membership to 38 institutions and organizations from 15 countries. In Dubrovnik, the members of the Working Group on Aquaculture Education signed a Memorandum of Understanding on the establishment of a Joint NACEE Master Course in Aquaculture.

During the forthcoming Fourth Meeting of NACEE Directors, participants are expected to review the last year's progress of NACEE in general and its Working Groups in particular, to decide on relevant organizational, technical and financial issues, and to find ways to improve collaboration, with special regard to joint project activities. Particular emphasis will be given to the development of project proposals and related fund raising opportunities.

ACTIVITIES BEFORE AND DURING THE MEETING

The discussions of the Fourth Meeting of Directors are to build upon the discussions and decisions of the Third Meeting. The participants will receive a number of Meeting Documents in advance of the Meeting, for their review and inputs. Some documents will require contribution by the participants. The participants will be expected to actively contribute to preparations before the Meeting and to discussions during the Meeting on several important

issues and aspects important for the future of the Network. In particular, the participants of the Meeting are expected:

- i. to evaluate the progress since the last Meeting of Directors and the work of the Coordinating Institution of NACEE on the basis of the previously disseminated Progress Report;
- ii. to discuss and accept the Financial Report of the Coordinating Institution on the operation of the Network;
- iii. to evaluate the activities of the four NACEE Working Groups on the basis of their Progress Reports, prepared and disseminated in advance;
- iv. to discuss the possibilities of making the structure and functioning of NACEE more efficient;
- v. to discuss the possibilities of improving information exchange and communication between the members;
- vi. to discuss the status of joint bi- and multilateral project activities between NACEE members and involvement of NACEE, as a separate entity, in international programmes;
- vii. to collect and discuss specific proposals by NACEE members for joint projects to be submitted during the years 2007-2009;
- viii. to provide information on the 7th Framework Programme of the EU and the possibilities of involvement and fund-raising for NACEE countries;
- ix. to exchange information on strategic aquaculture development efforts in the NACEE region and to discuss the involvement of NACEE in the elaboration of a Sustainable Aquaculture Development Strategy for countries of the NACEE region;
- x. to plan future activities with special regard to upcoming events of special importance and determination of the time and venue of the Fifth NACEE Directors' Meeting.

MEETING DOCUMENTS AND DEADLINES OF THEIR DELIVERY

- Discussion Material and Instructions for Authors – deadline: 29 June 2007 (responsible: HAKI);
- Proposals and suggestions for issues to be discussed during the meeting – deadline of submission: 13 July 2007 (responsible: NACEE Member Institutions);
- Evaluation of NACEE-related activities of the member institutions for the past year – deadline of submission: 13 July 2007 (responsible: NACEE Member Institutions);
- Proposals for joint project proposals for submission in the years 2007-2009 – deadline of submission: 13 July 2007 (responsible: NACEE Member Institutions);
- Progress Reports of the four NACEE Working Groups – deadline: 27 July 2007 (responsible: NACEE Lead Centres);
- Progress Report and Financial Report of the NACEE Coordinating Institution – deadline: 17 August 2007 (responsible: HAKI);

- Report of the Fourth Meeting of NACEE Directors – deadline: 31 October 2007 (responsible: HAKI).

PARTICIPATION

The Meeting is expected to be attended by Directors of NACEE member institutions; leading experts of some institutions; experts of FAO's Aquaculture Management and Conservation Service, FAO, Rome; FAO Sub-Regional Office Budapest, Hungary. Leading representatives of the leading European aquaculture organisations (e.g. EAS; EFARO; EUROFISH; European Commission – DG Fish, Aquaculture Unit, and DG Research; FEAP) and NACA will also be invited.

PROGRAMME**of the****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Date:** 27-29 September 2007**Venue:** Natural Science Museum Complex (NSMC), Galați, Romania**26 September, Wednesday**

7.00-19.00 Arrival and accommodation of participants

19.00 Welcome Dinner on Boat "Malnas"

27 September, Thursday

8.00-8.15 Registration in the Hall of NSMC

8.15-8.45 Opening and introductory remarks (Chairs: V. Cristea and N. Patriche)

- *Neculai Patriche, Director of ICDEAPA*
- *Victor Cristea, Head of the Department of Fisheries and Aquaculture, "Dunarea de Jos" University of Galați*
- *Gheorghe Stefan, President of the National Agency for Fisheries and Aquaculture, Ministry of Agriculture and Regional Development of Romania*
- *Ichiro Nomura, Assistant Director General, Fisheries and Aquaculture Department, FAO*
- *Laszlo Varadi (NACEE)*

8.45-9.45 Discussion and adoption of the Progress Report and Financial Report of the NACEE Coordinating Institution (L. Varadi)

9.45-9.55 Coffee break (Hall of NSMC)

9.55-10.00 Group photo

10.00-12.00 Discussion of the reports and future activities of the four NACEE Working Groups (Chairs: L. Hadjinikolova, Yu. Pimenov)

- *10.00-11.00 Sturgeon breeding (L. Vasilyeva)*
- *11.00-12.00 Fish genetics and selection (A. Bogeruk)*

12.00-13.00 Buffet lunch at NSMC

- 13.00-15.00 Discussion of the reports and future activities of the four NACEE Working Groups (continued) (Chairs: L. Hadjinikolova, Yu. Pimenov)
- 13.00-14.00 *New and high-value species (L. Varadi)*
 - 14.00-15.00 *Aquaculture education (B. Glamuzina/K. Tylik)*
- 15.00-15.30 Coffee break
- 15.30-17.00 Strategy of aquaculture development in the NACEE Region (Chairs: B. Glamuzina, I. Hrytsynyak)
- 15.30-16.00 - *Implementation of the 2002 strategy for the development of a sustainable European Community aquaculture: contribution to extensive aquaculture in ponds and new aqua-environmental measures in EFF (J-C. Cueff, DG Fish, Aquaculture Unit, EU)*
 - 16.00-16.30 - *Methodology of elaboration of an aquaculture development strategy for the NACEE region, taking into consideration natural, climatic and socioeconomic conditions (A. Bogeruk)*
 - 16.30-17.00 - *Discussion of NACEE project proposals for technical assistance for development of sustainable aquaculture strategy for NACEE region (L. Varadi)*
- 17.00-17.30 Comfort break
- 17.30-18.00 News of the partner organizations (NACA, EAS, EUROFISH, FAO/REU, EFARO) (Chair: N. Patriche)
- 18.00-19.00 Individual Working Meetings of NACEE WGs to finalize summaries of conclusions, recommendations and commitments for follow-up activities
- 20.00 Dinner ("Crama haiduceasca" Restaurant, Hotel Galmondo)

28 September, Friday

- 8.00-10.00 Discussion of current issues of relevance to the whole Network (structure, functioning, collaboration, joint projects, topics proposed by the participants) (Chairs: A. Bogeruk, L. Varadi. Presenter: P. Lengyel)
- 10.00-10.30 Coffee break
- 10.30-13.00 Presentation and Discussion of the 7th Framework Programme – project development opportunities for NACEE (Chairs: M. Kocour, Z. Zakes)
- 10.30-11.00 *Introduction and aquaculture research in FP6 (M. Lopes dos Santos, EU DG Research)*
 - 11.00-11.30 *EUROCARP " Disease and Stress Resistant Common Carp: Combining Quantitative, Genomic and Proteomic and Immunological Marker Technologies to Identify High Performance Strains, Families and Individuals". (Zs. Jeney, HAKI, Hungary)*
 - 11.30-12.00 *Experiences and opportunities for cooperation with 3rd world countries. (P. Sorgeloos, Member of the EAG of Theme 2 "Food, Agriculture, Fisheries and Biotechnology")*
 - 12.00-13.00 *Discussion*

13.00-14.00	Buffet lunch at NSMC
14.00-14.30	Aquaculture research in FP 7. (M. Lopes dos Santos, DG Research)
14.30-16.00	Discussions and conclusions (J-C. Cueff, Zs. Jeney, M. Lopes dos Santos, P. Sorgeloos)
16.00-16.30	Coffee break
16.30-18.30	Conclusions, recommendations and follow-up (Chair: P. Kindurys. Presenter: P. Lengyel): <ul style="list-style-type: none"> • <i>Recommended time schedule of inter-sessional activities by NACEE members</i> • <i>Time and venue of the Fifth NACEE Directors' Meeting (L. Varadi)</i> • <i>Upcoming events of special importance</i> • <i>Key conclusions and commitments by NACEE members</i>
20.00-	Dinner ("Crama haiduceasca" Restaurant, Hotel Galmondo)

29 September, Saturday

08.00-10.00	Time for individual Working Group meetings; Finalization and reproduction of Meeting Report
10.00-12.00	Discussion and adoption of the Meeting Report (L. Varadi)
12.00-12.30	Closing addresses <ul style="list-style-type: none"> • <i>Uwe Barg, FAO</i> • <i>Hosts (V. Cristea and N. Patriche)</i> • <i>L. Varadi (NACEE)</i>
12.30-14.00	Farewell lunch ("Television Tour" Restaurant)
14.00-	Departure

After the official programme, an optional post-conference tour will be organized to the Danube Delta. The provisional programme of the tour is as follows:

<i>29 September</i>	<i>Departure to Tulcea after lunch, spending the night at a hotel in Tulcea</i>
<i>30 September</i>	<i>Whole-day boat excursion in the Danube Delta, spending the night in Tulcea</i>
<i>1 October</i>	<i>Departure of participants</i>

LIST OF PARTICIPANTS**of the****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007****REPUBLIC OF BELARUS**

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OPENING ADDRESS

by

**Dr Ichiro Nomura,
Assistant Director-General
FAO Fisheries and Aquaculture Department**

at the

**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007**

Professor Dr Cristea, Professor Dr Patriche, Dr Stefan, Dr Varadi and Professor Dr Rauța,

It is with great pleasure that I join this meeting here in Galati. For FAO's Fisheries and Aquaculture Department it is in fact a very significant opportunity to express our recognition and appreciation for the work and efforts carried out by all friends of the Network of Aquaculture Centres in Central-Eastern Europe.

We do recognize the very special efforts undertaken by the local organizers in making all the necessary arrangements to host the Fourth Meeting of NACEE Directors. I am certain colleagues of the Dunărea de Jos University (UDJ) and of the Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture (ICDEAPA) have given their best to facilitate this meeting.

Surely, Dr Gheorghe Stefan and his colleagues of the Ministry (the National Agency for Fisheries and Aquaculture) have also contributed in many ways to this event. Thank you!

We also appreciate in particular that this meeting is being held in the town of Galati. Many thanks to the offices of the administration of Galati. We are pleased to be guests in Galati.

Our special appreciation to Dr Laszlo Varadi and his team at HAKI (Research Institute for Fisheries, Aquaculture and Irrigation in Szarvas, Hungary), the Coordinating Institution of NACEE. From my staff we know that it is the energy, enthusiasm and tireless dedication of HAKI colleagues to NACEE which has facilitated many "*small steps in the right direction*" for NACEE to grow during the past four years and to become a regional aquaculture network already known by the global aquaculture community.

NACEE Directors, Friends of NACEE,

The FAO Fisheries and Aquaculture Department, in particular, the Aquaculture Management and Conservation Service (FIMA) as well as colleagues from other FAO units, have been providing support to NACEE since Dr Varadi informed the Aquaculture Sub-Commission of the European Inland Fisheries Advisory Commission about the NACEE initiative. In fact,

NACEE also approached FAO with the offer for collaboration and with a request for assistance to the emerging NACEE network.

The Sub-Committee on Aquaculture of the Committee on Fisheries already in its first sessions in 2002 and 2003 had recognized the success of NACA (the Network of Aquaculture Centres in Asia-Pacific) and the importance of regional aquaculture networks for sustainable aquaculture development. The Sub-Committee encouraged FAO to provide support to such initiatives which would promote the establishment of regional aquaculture networks in regions such as Africa, Latin America and the Caribbean, and Central and Eastern Europe.

My aquaculture colleagues in Rome have recognized the significant potential of the emerging NACEE network and have since the informal meetings in Wierzba in 2004 worked to facilitate technical, strategic and financial support to your network. Colleagues in FAO's Sub-regional Office in Budapest also assisted NACEE in the development of the NACEE home page.

Together, NACEE and FAO colleagues have seen NACEE grow. Your network now has 39 member institutions, covering most countries in the Central and Eastern European region.

During the last four years, you, the NACEE members have worked together in various areas and fields of aquaculture research and development. Communication among members has been growing and collaboration has been enhanced where possible. Special efforts are increasingly being undertaken to develop proposals for joint projects, for submission to donors and for joint implementation, within the framework of the NACEE network.

In 2006 NACEE has been granted official formal Liaison Status with FAO. Dr Varadi, present coordinator of NACEE, attended last year's Session of the COFI Sub-Committee of Aquaculture in New Delhi, India. This year we see that key experts and officials from Europe and Asia, and, in particular, from the European Commission are attending the NACEE Meeting in Galati.

In our view, these are "*significant steps in the right direction*". We all know that launching a regional aquaculture network is not an easy task. There can be some significant challenges on the way to a self-sustaining network. However, the first years of NACEE have shown that there is certainly a need as well as many opportunities for regional collaboration in aquaculture in Central and Eastern Europe, in particular also for technical and scientific cooperation among the leading aquaculture institutions in your region.

However, in many ways, the aquaculture sector in many regions and countries does require additional guidance and assistance at levels beyond the technical and scientific levels. Like other sectors the aquaculture and fisheries sectors in your region have experienced or are still experiencing a difficult transition period from centralized planning economies to new liberalized market economies. The challenges to both the aquaculture farmers and to the aquaculture sector in general can be huge. These challenges range from access to changing domestic and international markets, to market demand and supply fluctuations, to issues of access to appropriate financing, credit and insurance schemes, as well as to new legal and institutional management requirements.

It becomes increasingly clear that stronger involvement of institutions in charge of sectoral management of aquaculture is required to provide adequate good policy and governance

guidance to the people involved in aquaculture as well as in the associated supply and post-harvest sectors. In fact, NACEE members have already expressed strong interest in such issues. Some NACEE members have also recognized the significant opportunities of enhancing collaboration with their aquaculture colleagues working in the government authorities in their countries with a view to strengthening such sectoral management activities. Several times have NACEE colleagues also discussed the future possible transformation of NACEE into an intergovernmental network, following the example of NACA. In our view, such considerations are also “*useful and important strategic steps into the right direction*”. The NACEE network and its NACEE members would certainly benefit from increasing recognition and support by their own government authorities.

NACEE Directors, Friends of NACEE,

FAO believes that, in the long run, a network such as NACEE should be self-sustaining. We do know well that the NACEE network is still very young, and that it will continue to need additional assistance and support for some years to come. Although FAO cannot commit continued financial support in the light of stagnating budgetary allocations to FAO from its Member Governments, FAO will continue to assist NACEE, as far as possible, in facilitating steps and opportunities which would hopefully lead to such a self-sustaining network. However, we also believe that it is the responsibility and the commitment of the NACEE members that you continue to work together and master the challenges of creating a dynamic and independent network.

Lastly, I must sincerely apologize that I will be able to be with you only this morning's session due to other commitments.

With these words of encouragement and vision, I would like to wish you all a successful meeting and fruitful discussions.

PROGRESS AND FINANCIAL REPORT (2006-2007)

of the

**COORDINATING INSTITUTION OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)**

**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)**

Galați, Romania, 27-29 September 2007

1. Progress Report on NACEE's status and network activities 2006-2007

1.1. NACEE membership

During the past year, one more institution, the Interdepartmental Center of Protected Territories of the Belarusian State University, Minsk, Belarus, has joined NACEE, thus increasing its membership to 39 institutions from 15 CEE countries.

1.2. EU Projects with collaboration of NACEE member institutions

HAKI, with collaboration of European institutions and organizations, has submitted several project proposals to the European Commission in 2006 and 2007.

1.2.1. The **EASTAQUANET** („Development of the Network of Aquaculture Centres in Central-Eastern Europe to support sustainable aquaculture”) project proposal was resubmitted to the call FP7-KBBE-2007-1 („Consolidate alliances with third countries in the field of aquaculture”) together with the European Aquaculture Society and EUROFISH in May 2007. This project would allow the improvement of collaboration and information exchange within NACEE by organizing workshops, conferences and training courses. The idea is that EASTAQUANET project will form a sub-network within NACEE having one representative NACEE member from each region of similar geographical, economical and sociological character. Four regions were designated: EU countries; Russia; Belarus, Ukraine, Moldova; West Balkans. One partner was also required from non-NACEE countries. Although all NACEE members will be invited to the meetings and workshops of the project, in some activities, the countries will be involved only through the sub-network institutions. These institutions and countries will be the hosts of local workshops and study tours as well.

The project is managed by a consortium, including EAS, EUROFISH and HAKI (coordinator). The members of the sub-network are the following institutions:

- Research Institute for Fisheries, Aquaculture and Irrigation, Hungary
- Pedigree Fish Breeding Center – Moscow Branch of the Federal Center of Fish Genetics and Selection, Russia
- Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences, Ukraine
- University of Dubrovnik, Croatia,
- Fisheries Research and Production Centre of the Ministry of Agriculture of Kazakhstan.

During the evaluation process, the proposal reached the minimum threshold level, however, with this score, we do not have a real chance to be granted. HAKI together with EAS and EUROFISH decided to rewrite the proposal and resubmit it again.

1.2.2. In the framework of NACEE, two **TEMPUS** projects were submitted to the EU, aiming at elaborating common aquaculture curricula, as a preparation to the declared objective of NACEE of establishing a Joint NACEE Master Course in Aquaculture. One of these projects concentrates on the West Balkan region, with the participation of the University of Dubrovnik (Croatia), Szent Istvan University (Hungary), University of Debrecen (Hungary) and the University of Kaposvar (Hungary). Unfortunately, the project did not win.

1.2.3. The other TEMPUS/TACIS project, named „**CoMAqua** – Cooperation for Masters’ Curriculum Development in Aquaculture and Fisheries” would be coordinated by the Kaliningrad State Technical University (Russia). The other consortium members are: Research Institute for Fisheries, Aquaculture and Irrigation (Hungary), Szent Istvan University (Hungary), University of Debrecen (Hungary), Wageningen University (Netherlands), Astrakhan State Technical University (Russia), Institute for Fisheries of the UAAS (Ukraine) and Kherson State Agricultural University (Ukraine). To the moment, we are still awaiting the decision; no information has been received yet.

1.2.4. During the visit of a HAKI delegation to Astrakhan, a decision was reached on the submission of the joint project “**STURFRY** - New intensive biotechnologies of using wild producers of rare and endangered sturgeon fish species of the Azov-Caspian basin for aquaculture”. The members of the consortium are Aquaplan-Niva (Norway), the Russian Academy of Sciences, Astrakhan State Technical University (Russia), HAKI and the Stanislaw Sakowicz Inland Fisheries Institute. The project proposal was successfully finalized and submitted in May 2007. To the moment, we are still awaiting the decision.

1.3. Networking and exchange of information

1.3.1. NACEE website

There has been a continuing work on the development of NACEE web site. The majority of the work has been done in HAKI, but assistance has been received from the FAO Sub-Regional Office for Central and Eastern Europe. A well-designed and operational web page is available now; however, there is a need for its further improvement, which requires contributions of information, data and visual materials from the member institutions as well. There were some suggestions from NACEE members for the development of the webpage. Members have received the action plan developed on the basis of these proposals and it will be discussed later during the present Meeting.

1.3.2. Collaboration and information exchange among members

HAKI, as the Coordinating Institution, has facilitated the communication and exchange of information among members and provided information of common interest to member institutions. The improved knowledge about the activities of member institutions through NACEE has also encouraged the establishment of direct contact and the development of collaboration between various member institutions.

Direct contacts between HAKI and other member institutions have also taken place. Researchers from the Stanislaw Sakowicz Inland Fisheries Institute (Poland) and a delegation from the Research Institute of Fish Culture and Hydrobiology (Czech Republic) visited HAKI in November 2006 and a delegation from Astrakhan State Technical University came to HAKI and Szent Istvan University in March 2007. During this visit, a framework agreement on collaboration between HAKI and ASTU was concluded. The agreement delineated several fields of collaboration, among which, it was agreed that a young researcher from ASTU would be employed by HAKI for a period of two years.

A HAKI delegation visited Astrakhan in April, during the International Symposium „Warmwater Aquaculture and Biological Productivity of Water Bodies of the Arid Climate”, on which occasion, an ad-hoc NACEE meeting was held with the participation of representatives from 6 member institutions and 2 observers. The minutes of the meeting were sent to all NACEE members. Cooperation was also discussed between a major Hungarian fish farm, on the one side, and the Southern Scientific Centre of the Russian Academy of Sciences and ASTU, on the other side.

In June 2007, Laszlo Varadi was invited to Lithuania, where he visited the State Pisciculture and Fisheries Research Centre, as well as the Ministry of Agriculture and several fish farms. During this visit, he met also the Minister of Agriculture, with whom he discussed possibilities of cooperation and provided information on the development and opportunities of NACEE.

NACEE members were asked to inform the Coordinating Institution on the development of their NACEE-related activities in the past year. An evaluation of their answers is attached in Annex 1 to this document.¹

It can be seen from the document that information exchange has not improved as much as we would like it to. The same is the situation with exchange of scientists, although, there is some development, e.g. in the framework of NACEE, HAKI has just employed a young researcher from Astrakhan State Technical University, as mentioned above. An exchange is also starting between the University of Dubrovnik and Szent Istvan University in the field of education.

Participation in training courses with non-NACEE institutions has not really improved yet, but between NACEE institutions, there is some development. The most significant improvement is observed in the field of joint projects and in the participation in each other's conferences and other events.

1. 3.3. Collaboration with other institutions and organisations

1.3.3.1. EFARO:

During the NACEE Directors' Meeting in Dubrovnik it was decided that cooperation possibilities would be discussed with EFARO. An EAS-EFARO meeting financed by EAS was a good opportunity to also represent NACEE and discuss collaboration between the two organisations. A previous idea was to establish an Aquaculture Board within EFARO with the involvement of EAS and NACEE. However, as Martin Scholten, president of EFARO, explained, the organisation had gone through some structural changes, and therefore, the possible link with NACEE should be reconsidered.

¹ Intended for internal use of NACEE members only and not attached in the present publication.

EFARO has become a registered association (in France). The maximum number of institutions per country is two, and the annual membership fee is 3000 EUR. The objectives of the organisation are the same, however, the new structure is strengthening the focus on marine fisheries research. Aquaculture, especially freshwater aquaculture research aspects may not be the competence of EFARO, however, it will be discussed in the coming meeting of EFARO. If EFARO member institutions agree to deal with aquaculture issues, we have to discuss the possibility of collaboration. EAS, as a declared partner of EFARO, attends EFARO meetings as observer and this status could also be an opportunity for NACEE in the future if aquaculture focus within EFARO will be decided to be strengthened.

In his message to NACEE sent before this meeting, Martin Scholten, president of EFARO, confirmed that they considered NACEE a very important twin organization of EFARO, and intended to further develop the partnership between the two organizations. Unfortunately, he could not come to Galati personally, but sent a presentation on EFARO and is ready to visit HAKI in the nearest future to discuss possible collaboration.

1.3.3.2. EATP:

The new European scheme “European Technology Platforms”, (http://cordis.europa.eu/technology-platforms/home_en.html) may offer a possibility for NACEE to be involved in European-level programs to define research and development priorities, timeframes and action plans. The preparatory work for the establishment of a “European Aquaculture Technology Platform” have been started. The main concept is that the aquaculture industry will define R&D needs together with stakeholders of the industry through the activity of the EATP. Well-defined research programmes will then be financed by DG Research. NACEE may be involved in the activity of the “knowledge” pillar and/or the “association” pillar of EATP. The First Stakeholders’ Meeting of EATP was held in Brussels, Belgium, on 22 March 2007. NACEE was represented by Peter Lengyel. More detailed information on the initiative as well as the minutes of the First Stakeholders’ Meeting are available on the website of EATP: <http://www.eatpnet.eu>. The Second Stakeholders’ Meeting will take place in Brussels on 8-9 November 2007.

1.3.3.3. PANDA:

HAKI had previously requested information from all NACEE members on their fish disease research for presenting it during the closing workshop of the PANDA Project in Weymouth, Great Britain. NACEE was represented by Dr. Zsigmond Jeney (HAKI), who attended the workshop using HAKI’s own resources. PANDA is very interested in collaboration with NACEE, as it sees it as a possibility for the Eastern extension of the project. Detailed information on PANDA is available on the webpage <http://www.europanda.net>.

1.3.3.4. EAS:

Unfortunately, there are still very few NACEE members in the EAS, although the annual fee is quite moderate (and even more reduced for most of the CEE countries), and membership entitles the members on significant reductions on EAS and WAS publications and conference fees.

1.3.4. Information materials

With the collaboration of HAKI and FAO, the new version of the NACEE Information Leaflet has been printed and distributed both to the members and the partner organizations.

The report of the Third Meeting of NACEE Directors has been printed by FAO and sent to members. It is also available in electronic version on the NACEE webpage (<http://agrowebcee.net/subnetwork/nacee/documents/Dubrovnik/3rdNACEEreportPDF.zip>).

Eurofish had previously offered NACEE to publish one page of information on NACEE every two months in the Eurofish Magazine. The information should be reader-friendly and in English. This would contribute towards making NACEE more visible and also increase co-operation both within and outside the network. The readers of the EM would also appreciate more information about aquaculture, in particular as regards developments in CEE.

In addition, through kind assistance of Andrey Bogeruk, the Board of Editors of the monthly scientific magazine “Rybovodstvo i rybnoe khozyaystvo” (Fish Culture and Fisheries) is ready to devote one special issue of the journal to NACEE.

2. Financial Report 2006-2007

The Financial Report for the Fiscal Year 2006 has been finalized and sent to all members by the Coordinating Institution. No comments have been received from the member institutions and the Financial Report is considered to be approved according to the Rules of Procedure of NACEE. It can be seen from the Financial Report (Annex 2 of the present document¹) that the income from the membership fees would approximately cover the costs related to the coordination, correspondence, translations and web site development. Unfortunately, the real income from membership fees was only 7500 EUR (25 members x 300 EUR) instead of the expected 10500, i.e. 10 members have not yet paid their dues for 2006. Accordingly, the missing 4749 EUR had to be covered by the Coordinating Institution.

The Preliminary Financial Report for 2007 is attached in Annex 3 of the present document.² The Final Financial Report will be sent to member institutions at the end of the Fiscal Year 2007.

The estimated cost will be 16,243 EUR by the end of 2007. This amount is significantly higher than the costs of 2006 (by 33%). This difference is due to the fact that, while the last year's activity of the Coordinating Institution was mainly focused on organizational tasks (webpage development, improvement of information exchange, etc.) and the largest cost item was the personnel cost, the work on the development of cooperation and joint projects has become more active this year, which needed visits to other institutions (a preparatory visit to Romania, meeting in Astrakhan, EATP and PANDA workshops). This, of course, has significantly increased the costs that were covered from HAKI's own resources. HAKI has contributed to the budget a total of 4843 EUR from its own sources.

The income from membership fees has been only 1200 EUR in 2007 (4 members). Since bank transfer of the membership fee is still difficult in many countries of Central and Eastern Europe, members usually pay the membership fee in cash during the annual Directors' Meeting. Thus, HAKI should pay the incurred costs in advance. HAKI is trying its best to finance the NACEE coordination activities in a flexible way also in the future, however, it is suggested to transfer the fee via banks by the end of the first quarter of the year wherever it is possible.

¹ Intended for internal use of NACEE members only and not attached in the present publication.

² Intended for internal use of NACEE members only and not attached in the present publication.

PROGRESS REPORT**of the****“STURGEON CULTURE” WORKING GROUP****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007**

During the Third Meeting of Directors of the Network of Aquaculture Centres in Central-Eastern Europe (NACEE) held on 28-30 September 2006 in Dubrovnik, Croatia, the membership of the „Sturgeon Culture” Working Group consisted of the following:

Founding members, joined during the 2nd NACEE Meeting:

1. „BIOS” Research and Production Center for Sturgeon Breeding, Astrakhan, Russian Federation (Lidiya Vasilyeva)
2. Federal Research Institute for Fisheries and Oceanography (VNIRO), Moscow, Russian Federation (Boris Kotenev)
3. State Scientific and Production Centre for Fisheries („Gosrybtsentr”), Tyumen, Russian Federation (Aleksandr Litvinenko)
4. Federal Research Institute of Freshwater Fish Farming (VNIIPRKH), Moscow Province, Russian Federation
5. Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences, Kiev, Ukraine (Vitaliy Bekh)
6. Institute of Genetics and Cytology of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus (Aliaksandr Slukvin)
7. Institute of Fisheries, Aquaculture and Irrigation (HAKI), Szarvas, Hungary (Laszlo Varadi)
8. Institute of Fisheries and Aquaculture, Plovdiv, Bulgaria (Liliana Hadjinikolova)
9. The Stanisław Sakowicz Inland Fisheries Institute, Olsztyn-Kortowo, Poland (Bogusław Zdanowski)

Additionally joined in 2006:

1. Faculty of Hydrobiological Resources and Aquaculture, Kherson State Agrarian University, Kherson, Ukraine (Isaak Sherman)
2. Institute of Fisheries of the National Academy of Sciences of Belarus, Minsk, Belarus (Viktor Konchits)
3. Fisheries Research Station (FRS), Chişinău, Moldova (Galina Curcubet)
4. University of South Bohemia, Research Institute of Fish Culture and Hydrobiology, Vodňany, Czech Republic (Otomar Linhart)
5. Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture, Galați, Romania (Neculai Patriche)
6. Department of Fishing and Aquaculture, „Dunărea de Jos” University, Galați, Romania (Victor Cristea)

We should note at once that several institutions actively cooperate with the Lead Centre, namely:

1. Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences, Kiev, Ukraine (Vitaliy Bekh)
2. Faculty of Hydrobiological Resources and Aquaculture, Kherson State Agrarian University, Kherson, Ukraine (Isaak Sherman)
3. Institute of Genetics and Cytology of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus (Aliaksandr Slukvin)
4. Institute of Fisheries of the National Academy of Sciences of Belarus, Minsk, Belarus (Viktor Konchits)
5. Fisheries Research Station (FRS), Chişinau, Moldova (Galina Curcubet)
6. The Stanisław Sakowicz Inland Fisheries Institute, Olsztyn-Kortowo, Poland (Bogusław Zdanowski)
7. University of South Bohemia, Research Institute of Fish Culture and Hydrobiology, Vodňany, Czech Republic (Otomar Linhart)
8. Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture, Galaţi, Romania (Neculai Patriche)

The Federal Research Institute of Freshwater Fish Farming (VNIIPRKH), Moscow Province, Russian Federation, has practically lost contact with us and has not participated in the activities of the „Sturgeon Culture” Working Group. It did not attend the Third NACEE Meeting and has not responded to any requests, in relation to which, its exclusion from the „Sturgeon Culture” Working Group is being considered.

A number of institutions have not been in contact with the Lead Centre, have not answered any questions, and their further participation in the Working Group will be discussed during the upcoming Meeting. These are the following institutions:

1. Federal Research Institute for Fisheries and Oceanography (VNIRO), Moscow, Russian Federation (Boris Kotenev)
2. State Scientific and Production Centre for Fisheries („Gosrybtsentr”), Tyumen, Russian Federation (Aleksandr Litvinenko)
3. Institute of Fisheries, Aquaculture and Irrigation (HAKI), Szarvas, Hungary (Laszlo Varadi)
4. Institute of Fisheries and Aquaculture, Plovdiv, Bulgaria (Liliana Hadjinikolova)
5. Department of Fishing and Aquaculture, „Dunărea de Jos” University, Galaţi, Romania (Victor Cristea)

The following institutions have returned the annual questionnaire on their activities in the „Sturgeon Culture” Working Group in the year 2006:

1. Institute of Genetics and Cytology of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus
2. Institute of Fisheries of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus
3. Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture, Galaţi, Romania
4. University of South Bohemia, Research Institute of Fish Culture and Hydrobiology, Vodňany, Czech Republic

5. The Stanisław Sakowicz Inland Fisheries Institute, Olsztyn-Kortowo, Poland
6. Fisheries Research Station (FRS), Chişinău, Moldova
7. „BIOS” Research and Production Center for Sturgeon Breeding, Astrakhan, Russian Federation
8. Kherson State Agrarian University, Kherson, Ukraine (incomplete questionnaire)

In 2006, all the above-mentioned institutions continued or finished R&D projects in the field of sturgeon culture related to the following subjects:

- Development of a preparation for taking away the egg stickiness of economically important fish species on the basis of protease-producing microorganisms (Institute of Genetics and Cytology of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus)
- Three sterlet-related projects on reproduction technology and market fish rearing in concrete tanks and net cages, as well as biological bases of stocking sterlet into reaches of rivers in the Dnieper Basin (Institute of Fisheries of the National Academy of Sciences of Belarus, Minsk, Republic of Belarus)
- Eight projects in the field of sturgeon culture on the following topics: production and rearing technology of hybrids and parental species of sturgeons; technologies of interspecific polyculture of acclimatized and endemic sturgeon species in raceways for improvement of living aquatic resources; and characteristics of sturgeons produced by quality aquaculture – these projects have been finished. The following projects are in progress: development of a recirculation system, development and introduction of intensive technologies for rearing high-value species; methodology of long-term conservation of living aquatic resources in fish farms; development of spawning technologies for rare and endangered fish species; research on development of intensive and highly intensive aquaculture in controlled locations (Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture, Galaţi, Romania). In the previous years, this institute did research on the following subjects: keeping sturgeon broodstocks; monitoring of the status of natural populations; fry rearing; artificial reproduction and acclimatization; establishment of genetic collections; physiological studies; fish feeds and feeding; gamete cryoconservation.
- Three projects on the subjects of reproduction, cryoconservation of the genetic material of sturgeons and sturgeon sperm research are done in the University of South Bohemia, Research Institute of Fish Culture and Hydrobiology, Vodňany, Czech Republic.
- Improvement of sturgeon rearing methods and an innovative research project on rehabilitation of the Baltic sturgeon (The Stanisław Sakowicz Inland Fisheries Institute, Olsztyn-Kortowo, Poland)
- Four projects on the subjects of establishment of sturgeon broodstocks, introduction of paddlefish fingerlings from Romania, complementing of the gene pools of sturgeons and paddlefish (Fisheries Research Station (FRS), Chişinău, Moldova)
- Five projects on the following subjects: technology of establishment of sturgeon broodstocks in typical farm conditions of the Caspian basin, improvement of the efficiency of artificial reproduction in high-value species of the Caspian basin, and elaboration of the fisheries biological foundations of sturgeon farming in the conditions of Tiraspol, Astrakhan Province, Russia.
- Projects on keeping broodstocks, monitoring of the status of natural populations, fry rearing, artificial reproduction and acclimatization, selection and breeding work, physiological and ichthyological research, feeds and feeding, and domestication were implemented in the Kherson State Agrarian University, Kherson, Ukraine.

The staff changed little during the last year, only was complemented due to the joining of additional institutes to the Working Group.

The Institute of Fisheries of the National Academy of Sciences of Belarus has 4 (four) Candidates of the Biological Sciences, specialists in the fields of hydrobiology, biochemistry, feed production, microbiology and ichthyology, parasitology, helminthology and culture of live feeds.

The Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture (Galați, Romania) has specialists in biochemistry (Doctor of Sciences), fish technology (Doctor of Sciences), sturgeon aquaculture (Doctor of Sciences) and others.

The University of South Bohemia, Research Institute of Fish Culture and Hydrobiology (Vodňany, Czech Republic) has specialists in fish genetics and selection (Candidate of Sciences and Doctor of Sciences), physiology and cryoconservation of sperm, feeds and feeding, recirculation systems (Candidate of Sciences), fish diseases, fish hematology (Doctor of Sciences), artificial reproduction of fish (Doctor of Sciences).

The Fisheries Research Station (FRS) (Chișinău, Moldova) has specialists on paddlefish and reproduction of Danube sturgeons.

The facilities did not change much either, information was added only from the newly joined members.

The Institute of Fisheries of the National Academy of Sciences of Belarus has laboratories for performing microbiological, hydrobiological, physiological research. The Laboratory of Live Feeds rears *Daphnia*, white worms, vinegar nematodes, redworms and algae; the Laboratory of Feeds develops starter and production feeds.

The Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture, (Galați, Romania) has experimental and production facilities for sturgeon rearing and laboratories for performing physiological, microbiological, genetic, ultrasonographic and endoscopic research.

The University of South Bohemia, Research Institute of Fish Culture and Hydrobiology (Vodňany, Czech Republic) has a well-equipped material-technical base consisting of laboratories of graphical analysis, flow cytometry, reproductive physiology, quantitative genetics, as well as aquarium facilities and a fish farming station including a selection genetics unit, a recirculated fish hatchery, ponds with a total area of 25 ha and cages with a total area of 65 m². I would like to make a special mention of them and express my gratitude for the detailed information illustrated with photographs.

The Fisheries Research Station (FRS) (Chișinău, Moldova) has incubation jars, aquaria, tanks, cages, ponds, as well as laboratories of fish reproduction and selection, hydrochemistry, disease diagnostics and prevention.

The above institutions do research on sturgeon species such as Russian sturgeon, sterlet, beluga, starry sturgeon, Siberian sturgeon, Baltic sturgeon and paddlefish.

All member institutions of the „Sturgeon Culture” Working Group have noted the inadequate information supply. In relation to this, a decision was made in Dubrovnik (at the Third NACEE Meeting) on establishing a joint sturgeon culture library, for which purpose each institution was required to submit a list of owned literature. To the moment, only 4 (four) institutions have provided such lists: the Kherson State Agrarian University, Ukraine, the Fisheries Research Station, Moldova, The Stanisław Sakowicz Inland Fisheries Institute, Poland and the „BIOS” Research and Production Center for Sturgeon Breeding, Russia. This issue will be discussed at the upcoming meeting of the Working Group.

Finally, I would like to stop for a while on the issue of „Factors impeding the active work of the Sturgeon Culture Working Group”:

First of all – and principally – it is the lack of interest among the Working Group members themselves: out of the 15 institutions that had expressed their intention to work on problems of sturgeon culture, only 5-6 (i.e. 30-40%) respond to requests of the Lead Institute. It can be understood that it is very difficult to generalize data provided by less than a half of the institutions.

On the other hand, the Coordinating Institution does not effectively present analytical, processed materials from the provided data, for which purpose it would be important to start more active work on the creation of a “Sturgeon Culture” page on the NACEE website.

From other comments and suggestions:

It is indispensable to organize a long-term programme of joint actions of the member institutions of the „Sturgeon Culture” Working Group, which would include the following work areas:

- Bilateral and multilateral scientific research already performed by the institutions from national funds, as well as searching international grants;
- Exchange of the accumulated scientific and practical experience in the field of sturgeon culture, for which it is principally important to establish a joint library;
- Holding joint conferences, exhibitions, seminars, as well as active participation in events held by any member institution of the Working Group. E.g., in this March, the „BIOS” Center held an annual international scientific and practical training workshop for sturgeon farmers where 40 people participated from 6 countries, whereof only 2 institutes from Belarus were members of NACEE.
- Organization of exchange of biological material on mutually beneficial conditions, for which purpose the members should provide data on the available stocking material in the beginning of each year;
- Unite forces for a joint publication of a catalogue of commercially important sturgeon species and hybrids.

These directions can be broadened, complemented, deepened, which will be discussed on the meeting of the Working Group, but in order to compile or, what is more, to implement such a programme, the interest and activity of all institutions is required. As it is said: “Make a wish, but make a move!”

REVIEW**„STATUS AND DEVELOPMENT PERSPECTIVES OF MARKET STURGEON REARING IN COUNTRIES OF CENTRAL AND EASTERN EUROPE”**

by

Lidiya Vasilyeva**“BIOS” Research and Production Center for Sturgeon Breeding, Astrakhan, Russia****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007**

Materials for the review were submitted by 6 (six) countries:

- Russia – “BIOS” Research and Production Center for Sturgeon Breeding
- Belarus – Institute of Fisheries of the Scientific and Practical Center for Animal Husbandry of the National Academy of Sciences of Belarus
- Moldova – Fisheries Research Station (FRS)
- Czech Republic – University of South Bohemia, Research Institute of Fish Culture and Hydrobiology
- Romania – Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture
- Ukraine – Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences.

Analysing the status of market sturgeon rearing in countries of Central and Eastern Europe:

1. First of all, it should be noted that interest for sturgeon rearing first appeared in countries that had been parts of the former Soviet Union (Russia – 1988, Moldova – 1980, Ukraine – 1977). This was determined by the fact that the Soviet Union had all the preconditions for the development of market sturgeon rearing: Soviet researchers had developed the basic biotechnologies for rearing these valuable fish species; professional and further training of specialists was in progress, adequate quantities of stocking material were available and so forth. Later, the transition of former Soviet republics to market economy and the economic depression after the collapse of the USSR resulted in development of sturgeon farming coming to a full stop. Since the middle of the 1990s, when natural sturgeon stocks started to diminish catastrophically, market sturgeon rearing began to develop in many countries of the world, including Central and Eastern Europe (Belarus, Czech Republic, Romania and others)
2. Market sturgeon rearing uses sturgeon species that had shown good fish culture characteristics (growth rate, survival): Russian and Siberian sturgeons and their hybrids, beluga, sterlet and their hybrid called bester, paddlefish. The starry sturgeon, also mentioned here, is seemingly used for ornamental purposes.

3. Practically all known rearing methods – culture-based fisheries, rearing in ponds, cages, tanks and recirculation systems – are used in the mentioned countries. Here it should be noted that while in ponds and natural water bodies fish is reared extensively and, as a rule, in polyculture, in cages, tanks and recirculation systems sturgeons are reared in monoculture and intensively – at high stocking densities and fed with artificial feeds – which reduces the time necessary for obtaining the final produce by a factor of 2. We would like to make a special mention of the method of sturgeon rearing in recirculation systems, which is applied in all countries. This method is highly effective, albeit with high energy costs. Experience shows that fish farms that deal seriously with sturgeon culture, want to obtain results quickly and have the resources build recirculation systems. Such enterprises currently operate in Russia, Moldova and Belarus. They are private enterprises as a rule. State enterprises have small, experimental recirculation systems.
4. According to expert evaluations, about 5,000 mt of market sturgeon are currently produced in countries of Central and Eastern Europe, whereof the major part is reared in Russia. In comparison, China produces up to 20,000 mt. I will talk later about the causes of this situation, but the main constraint is that there is no existing market in Europe for this produce.
5. At the same time, Western Europe intensively cultures sturgeons for obtaining food caviar („black caviar”). Germany, France, Italy already produce up to 30 mt of caviar annually, the USA – 50 mt, China is expected to export 200-300 mt of caviar to world markets in the coming 2-3 years. The countries of Central and Eastern Europe practically do not produce caviar with the exception of Russia where 3 (three) fish farming companies rear sturgeons for obtaining food caviar and are expected to produce about 4.5 mt of this valuable delicacy by the end of this year. It should be noted that caviar obtained from wild sturgeons is exported to world markets by Iran, Kazakhstan, Azerbaijan, Turkmenistan, for which an export quota of 67,528 kg has been set. Russia, having an export quota of 24,200 kg, cannot export caviar to world markets due to the lack of licence documents that should be issued by the Government. It is worth to mention that in the 1980s, when the Soviet Union had a monopoly on black caviar, 2,500 mt of this product were exported to world markets and the price of 1 kg of caviar was 300-600 USD, while now it is 1,500-2,000 EUR/kg.

Thus, the world market for sturgeon products is filled only to 50-60%, while for food caviar – only to 10-15%.

Establishment of sturgeon broodstocks in countries of Central and Eastern Europe

First of all, it should be noted that we tried to analyse the data submitted on the status of sturgeon stocks kept under controlled conditions in five countries of Central and Eastern Europe. It should be understood that these data are not very accurate, as this information is not obligatorily reported for statistical purposes, especially as regards private structures. Nevertheless, it is very interesting to summarise these data, as it permits us to assess the gene pool of sturgeons in countries of Central and Eastern Europe.

The attached table (Annex 5.1.3) shows that there are around 20 sturgeon broodstocks currently available in these countries. Broodstocks are established in order to preserve the gene pool of endangered species and with commercial purposes. With the purpose of

preserving the gene pool, broodstocks are established from species inhabiting water bodies of European countries – i.e. Russian sturgeon, beluga, starry sturgeon, sterlet, fringebarbel sturgeon, while for commercial purposes – from different hybrid forms, Siberian sturgeon and paddlefish. Broodstocks are created by two methods: by rearing fish from egg to mature stage or by domestication – adaptation of “wild” fish to artificial keeping conditions. The latter method is used only in countries where wild fish are still available. The number of actual breeders is generally 30-40% of the total broodstock. The main part of the total broodstock consists of the so-called recovery broodstock (60-70%). It should be noted that all listed countries are developing broodstocks of the acipenseriform Mississippi paddlefish (*Polyodon spathula*), as a promising species of the pond aquaculture of sturgeons.

Broodstock development is a timely issue in the current conditions and has a big importance over the background of the catastrophically diminishing natural sturgeon stocks. In this respect, the special attention of the entire European public, and primarily, of the countries' Governments, should be drawn to the importance of providing all the possible assistance and state support to enterprises preserving the gene pool of endangered fish species. These stocks should serve an extremely important purpose – rehabilitation of natural sturgeon populations. In this respect, it is interesting to examine what financial assistance the different countries provide for the development of sturgeon culture. In countries like Moldova or Romania, there is no state support neither for the development of productive stocks, nor for the development of market rearing of sturgeons. In Russia and Ukraine, resources are allocated for selection and breeding activities within sturgeon culture, while in the Czech Republic, funds are set apart for conservation of the sterlet gene pool. In addition, short-term (0.5-1-year) and long-term (5-8 years) subsidised credits, where the state pays 2/3 of the interest rate, have been offered in the last years to fish culture (including sturgeon culture) enterprises in Russia, while in the Republic of Belarus, the state pays the cost of the stocking material. The main supplier of sturgeon stocking material in Central and Eastern Europe is Russia. In addition, the Czech Republic imports stocking material from Germany, Hungary, Slovakia, and the USA; beside Russia, Ukraine buys fertilized eggs in Germany.

Analysing the status of application of research results in sturgeon culture, it should be noted that the main demand is principally for results of technological character and these are also the ones most applied. E.g. in Belarus, the technology of sterlet reproduction and fingerling rearing in (carp) pond farm conditions has been introduced; in Russia, the biotechnology of cage culture; in Moldova, the biotechnology of rearing stocking material for reproduction and market rearing; in Romania, the technologies of sturgeon rearing in extensive and intensive systems; in Ukraine, there is a demand for research results of technological character, related to the improvement of all stages of culturing paddlefish and sturgeons in conditions of industrial tank and cage farms.

The fact that in a number of countries (Russia, Czech Republic and Belarus) many interesting and not yet practically applied results have been accumulated also merits attention. In the last years, practical fish culturists have manifested a special interest toward some research results, such as application of recirculated water supply systems, methodological approaches toward development and exploitation of egg- and meat-producing sturgeon and paddlefish stocks, domestication of sturgeons reared for market purposes (adaptation of “wild” fish to artificial keeping conditions), early sex determination of reared fish, shortening of the periods between spawning events in breeders, issues of rearing viable offspring, prevention of diseases, etc. It is a great pity that these research works are not being developed well enough because of the lack of sufficient means for their implementation. A common characteristic feature of all studied countries is the extremely scarce financing of sturgeon culture research, mainly by

state structures. It should also be emphasized that even international grants financed by different funding organizations fail to pay sufficient attention to sturgeon-related issues.

Finally, it should be noted that market rearing of sturgeons in Central and Eastern Europe is well behind the leading countries of the world (China, the USA, Germany, Italy and France) that produce huge amounts of sturgeon products. The main reasons for this situation are the following:

1. Limited investments into the development of sturgeon aquaculture;
2. Practically missing state support, e.g. long-term subsidised credits (except Russia), tax reductions, dotations on stocking material (except Belarus) and feeds;
3. Insufficient supply of viable stocking material at accessible prices;
4. High cost of full-value, balanced, specialized artificial sturgeon feeds;
5. Lack of highly effective technologies, normative, technical and methodological documentation;
6. Inadequate supply of highly qualified specialists in the field of sturgeon culture.

Solving these problems, at least partially, is possible only by joining the efforts of all fisheries researchers and practical fish farmers in the frame of NACEE.

**Review „Status and development perspectives of market sturgeon rearing in countries of Central and Eastern Europe”
(on the basis of expert evaluations)**

№	Country	Start of development of market rearing of sturgeons	Cultured sturgeon species	Rearing methods	Number of market sturgeon rearing farms	Reared fish volumes	Volumes of aquaculture-produced sturgeon food caviar
1	Russia	1988	Russian and Siberian sturgeons and their hybrids, bester, sterlet, paddlefish	Cages, recirculation systems, tanks, ponds	28 private 2 state-owned	2003 – 1,500 mt 2004 – 2,000 mt 2005 – 2,500 mt 2006 – 3,500 mt	2004 – 500 kg 2005 – 2000 kg 2006 – 2500 kg
2	Belarus	2001	Russian and Siberian sturgeons and their hybrids, sterlet, bester	Ponds, cages, recirculation systems	2 private 3 state-owned	2003 – 8 mt 2004 – 15 mt 2005 – 20 mt 2006 – 40 mt	No
3	Moldova	1980	Sterlet, starry sturgeon, Siberian and Russian sturgeons, paddlefish	Ponds, tanks	3 private 2 state-owned	1 (one) mt annually	No
4	Czech Republic	1992	Sterlet, Russian and Siberian sturgeons, starry sturgeon, beluga, paddlefish	Ponds, culture-based fisheries, cages, recirculation systems	2 private 2 state-owned	_____	No
5	Romania	1992	Starry sturgeon, Russian sturgeon, beluga, sterlet	Culture-based fisheries, ponds, cages, recirculation systems	7 private 1 state-owned	_____	_____
6	Ukraine	1977	Siberian and Russian sturgeons, sterlet, bester, Russian x Siberian sturgeon, paddlefish	Ponds, cages, tanks, recirculation systems	Total: 15	50 mt annually	No

**Development of sturgeon broodstocks
(on the basis of expert evaluations)**

№	Country	Number of broodstocks	Fish species in the broodstock	Method of broodstock development	Number of breeders	Number of recovery broodstock
1	Russia	10	Beluga, bester, Russian and Siberian sturgeon, sterlet, fringebarbel sturgeon, starry sturgeon, paddlefish	Rearing from egg and domestication	about 9,000 ind.	over 50,000 ind.
2	Belarus	3	Russian and Siberian sturgeon, bester, sterlet	Rearing from egg	about 700 ind.	over 20,000 ind.
3	Moldova	4	Sterlet, starry sturgeon, paddlefish	Rearing from egg and domestication	—	about 500 ind.
4	Czech Republic	1	Sterlet, Russian and Siberian sturgeon, starry sturgeon, beluga, paddlefish	Rearing from egg	over 200 ind.	about 10,000 ind.
5	Ukraine	—	Russian and Siberian sturgeon, sterlet, paddlefish, bester	Rearing from egg and domestication	about 1,000 ind.	about 10,000 ind.

PROGRESS REPORT
of the
WORKING GROUP ON GENETICS OF CYPRINIDS AND OTHER FISH SPECIES
FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007

The main direction of activity of the members of the Working Group on Genetics of Cyprinids and Other Fish Species following the Third Meeting of the Board of Directors of NACEE was research on genetics, selection and breeding in fish culture.

Nine research institutions from seven Central and Eastern European countries (Belarus, the Czech Republic, Hungary, Moldova, Poland, Russia and Ukraine) participated in the execution of the selection and breeding work. A total of 21 research topics were studied, which can be classified into three groups according to the following main directions of work:

1. New methods in fish genetics and selection;
2. New selection results;
3. Normative and legislative issues in pedigree fish breeding.

In the first direction, it is important to mention the investigations done by research institutions of five European countries in the framework of the EU project „EUROCARP – Disease and stress resistant common carp: Combining quantitative genetic, genomic, proteomic and immunological markers to identify high performance strains, families and individuals”. The programme coordinator, Dr Zsigmond Jeney, will make a presentation on the progress of the project during the Fourth NACEE Meeting.

In addition to classic work on application of morpho-biological and immunological methods (in Russia: BIOS, FCFGS, VNIIPRKH), there is an increasing number of research projects applying molecular genetic analyses. VNIIPRKH (Russia) continues the research into fish transgenesis and, what is even more important, develops methods for assuring environmental safety of transgenic fish. In the Czech Republic (Research Institute of Fish Culture and Hydrobiology in Vodnany), the genetic variations of the common carp breeds of that country are studied and the optimal methods for artificial reproduction of common carp are being developed in order to avoid inbreeding.

A number of institutions continue research into application of cryoconservation in fish culture. VNIIPRKH (Russia) is developing a new formula for a cryoprotective agent containing antifreeze glycoproteins that would assure long-term storage of fish sperm, while IF UAAS (Ukraine) has established broodstocks of Ukrainian common carp breeds using cryopreserved sperm. VNIIPRKH, with the participation of institutes of the Russian Academy of Sciences, is elaborating a method for restoration of the genotype of sturgeons from cryopreserved spermia using disperse androgenesis. The Research Institute of Fish Culture and Hydrobiology (Czech Republic) is developing methods for mass selection of common carp for growth efficiency during semi-intensive rearing.

In the second direction, new common carp breeds are being submitted for approval:

- marked with „D” pattern gene (VNIIPRKH);

- mirror breed of Belarusian common carp with an increased resistance (BelNIIRKH);
- a highly productive breed group of Tremlya common carp with a fecundity of 750,000 eggs (BelNIIRKH).

Pedigree broodstocks of herbivorous fishes, paddlefish, wels catfish and common carp of the third-fourth generations of selection have been established in research institutions of Belarus, the Czech Republic, Moldova and Ukraine.

In the third direction, the system of organisational, legislative and economic fisheries management is being created.

Hungary has a Law on Common Carp Performance Testing since 1999, the main articles of which are currently applied by Russian pedigree fish farms as well.

Significant research on pedigree fish farm organisation and management is done by FCFGS (Russia). In 2007, the following should be prepared:

- methodological recommendations on economic evaluation of the establishment and exploitation of broodstocks of commercially cultured fish;
- methodological recommendations on certification of the produce of pedigree fish farms from the points of view of both fisheries biology and economic value; recommendations on organisation of economic activities in pedigree fish farms.

VNIIPRKH (Russia) is developing a system for identification of pedigree produce in fish culture.

FCFGS, BIOS, Gosrybtsentr, VNIIPRKH (Russia), HAKI (Hungary) and the Research Institute of Fish Culture and Hydrobiology (Czech Republic) establish gene bank collections with live broodstocks of the main cultured fishes, which are of basic importance for selection work and assure a stable supply of stocking material for selling to fish farms. FCFGS (Russia) has developed a methodology for establishing genetic collections of high-value, rare and endangered fish species of potential importance to aquaculture.

The Russian Federation has a Federal Law “On Pedigree Animal Breeding” since 1995. Currently, this law is being amended and completed, including the articles on pedigree fish breeding. I use the opportunity to thank the Czech and Hungarian colleagues for their help in applying the principal articles of their national laws on pedigree animal breeding for amending the Russian law.

The duration of most projects is 3-4 years, and their average budget is 90,000 EUR. The total financing of the themes included into the Coordination Plan for 2007-2010 amounts to 2.74 million EUR.

Evaluating in general the research on fish genetics and selection, we should note:

- first, that in some countries (Bulgaria, Poland, Romania), research in this field has either stopped or we have not received any information from our colleagues there. Due to the lack of financing, work on the establishment of a gene bank of cultured fish breeds has unfortunately been suspended,
- second, that no work is done on fish selection and breeding in 11 of the 19 CEE countries. This situation can be evaluated in two different ways. On the one hand, it would be desirable to do such research, but this requires human and financial resources. On the other hand, the aquaculture of these countries could serve as a good basis for introduction of fish breeds and crosses developed in other countries. It is worth to note that NACEE currently owns a wide range of common carp breeds adapted to a wide spectrum of climatic and ecological conditions,
- third, that it has become necessary to join the efforts of the selection and breeding specialists of NACEE countries for joint development of legislative and normative

documents on pedigree fish breeding. It is especially important now, as in some countries aquaculture-reared fish are not considered agricultural animals or the existing legislation does not emphasize the biological characteristics of fish and the specific character of fish selection and breeding,

- fourth, that despite the fact that parallelism in the selection work done by NACEE institutions has been noted in the previous meetings and all our colleagues have received the Coordination Plan on Genetics, Selection and Breeding, the researchers of the institutions of different countries have not made any approach toward each other. I consider it advisable to discuss the reasons of this during our meeting in Galati, as this issue is highly actual now due to the extremely limited financing and the decrease of the number of selectionists,
- fifth, that on the basis of the agreements made in Dubrovnik, FCFGS (Russia) has done some work on the compilation of a “Catalogue of Common Carp Breeds in Central and Eastern Europe”, both in Russian and English languages. We currently have full information, according to the forms discussed during the last meeting, on 11 Russian, 3 Ukrainian and 2 Belarusian breeds of common carp, as well as two breeds of the Fresinet common carp, the owners of which, according to the “Catalogue of Breeds, Crosses and Domesticated Forms of Fishes in Russia and the CIS” published in 2001, are our Moldovan colleagues, however, the history of development of these breeds can be traced back to Romania. We should make an important clarification here. We have the data of our Hungarian colleagues, who published the FAO Technical Paper „Genetic resources of common carp at the Fish Culture Research Institute, Szarvas, Hungary” in 2001, including information on 30 Central and Eastern European breeds and crosses of common carp. Unfortunately, we do not have data on Czech common carp breeds, although the selectionists of the Research Institute of Fish Culture and Hydrobiology in Vodnany have reached excellent results and currently have, according to their latest information, 25 common carp breeds and crosses. We request our Czech colleagues to inform us on their successes in the field of selection. During the meeting of the Working Group, we will discuss in detail the common carp breed description form and the required volume of the material, which may allow us to publish a “Catalogue of Common Carp Breeds and Crosses in Central and Eastern Europe” in Russian and English with the help of FAO in 2008,
- sixth, I have to admit, that we have not yet managed to discuss with the colleagues from the Network of Aquaculture Centres in Asia-Pacific (NACA) the „Plan and Programme of Joint Scientific, Technological and Economic Cooperation in Selection and Breeding” that we offered to NACA in 2005. We are ready to have such a discussion during this meeting or in the nearest future,
- seventh, that there is a great number of methodological issues in the field of fish domestication, breed development and improvement that are still unsolved due to the fact that even ichthyologists and fish breeders are on the opinion that fish is a poor object of selection for economically valuable traits. Many of us have constant discussions with zootechnicians as well. The latest issues of our journal, Aquaculture Europe, have published papers by Mr Martin Bilio on domestication in aquaculture, which also have several statements inviting discussion. I feel it very important to organise and hold a special workshop, not a symposium, but a workshop, where a roundtable discussion should be held on domestication and breed development in aquaculture. We already talk about this for the second time, but no final decision has been made yet, which makes it necessary to discuss this issue at the meeting of the Working Group.

Finally, we have to mention that we have proposed two projects for joint implementation in the field of genetics, selection and breeding. These proposals have been sent to all NACEE members by the Coordinating Institution:

1. Development of an international system of registration, utilisation and introduction of selection results into the world aquaculture.
2. Study of the genomics of cultured fishes and development of molecular genetic methods of establishing broodstocks for effective reproduction, biodiversity conservation and selection of highly productive fish breeds and crosses.

Unfortunately, we have not received any feedback to these proposals from our colleagues, so we hope to exchange our views during the meeting of the Working Group.

REPORT OF THE AD-HOC MEETING**of the****WORKING GROUP ON GENETICS OF CYPRINIDS AND OTHER FISH SPECIES****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
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In the first direction, it is important to mention the investigations done by research institutions of 4 European countries (Hungary, Great Britain, Norway, Russia) in the framework of the EU project „EUROCARP – Disease and stress resistant common carp: Combining quantitative genetic, genomic, proteomic and immunological markers to identify high performance strains, families and individuals”. The programme coordinator, Dr Zsigmond Jeney (HAKI), has made a presentation on the progress of the project.

In addition to classic work on application of morpho-biological and immunological methods (in Russia: BIOS, FCFGS, VNIIPRKH), there is an increasing number of research projects applying molecular genetic analyses. VNIIPRKH (Russia) continues the research into fish transgenesis and, what is even more important, develops methods for assuring environmental safety of transgenic fish. In the Czech Republic (Research Institute of Fish Culture and Hydrobiology in Vodnany), the genetic variations of the common carp breeds of that country are studied and the optimal methods for artificial reproduction of common carp are being developed in order to avoid inbreeding.

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Significant research on pedigree fish farm organisation and management is done by FCFGS (Russia). In 2007, the following should be prepared:

- methodological recommendations on fisheries economic evaluation of the establishment and exploitation of broodstocks of commercially cultured fish;
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The Russian Federation has a Federal Law “On Pedigree Animal Breeding” since 1995. Currently, this law is being amended and completed, including the articles on pedigree fish breeding. Thanks to the help of Czech and Hungarian colleagues, the principal articles of Hungarian and Czech laws on pedigree animal breeding have been used for amending the Russian law.

The duration of most projects is 3-4 years, and their average budget is 90,000 EUR. The total financing of the themes included into the Coordination Plan for 2007-2010 amounts to 2.74 million EUR.

Having heard and discussed the information presented by the coordinator of the Working Group, Mr. A. Bogeruk (FCFGS, Russia), the members of the Working Group agreed on the following:

- first, that no work is done on fish selection and breeding in 11 of the 19 CEE countries. This situation can be evaluated in two different ways. On the one hand, it would be desirable to do such research, but this requires human and financial resources. On the other hand, the aquaculture of these countries could serve as a good basis for introduction of fish breeds and crosses developed in other countries. NACEE, having a wide range of common carp breeds developed in Belarus, the Czech Republic, Hungary, Moldova, Poland, Russia and Ukraine, could coordinate the work on introduction of the available selection results,
- second, that it has become necessary to join the efforts of the selection and breeding specialists of NACEE countries for joint development of legislative and normative documents on pedigree fish breeding. It is especially important now, as in some countries aquaculture-reared fish are not considered agricultural animals or the

existing legislation does not emphasize the biological characteristics of fish and the specific character of fish selection and breeding,

- third, that a Coordination Plan on Genetics, Selection and Breeding has been developed on the basis of the proposals of several NACEE-member research institutions. This Plan has existed since 2005, but nonetheless, it has been impossible to eliminate the parallelism in the research work of most institutions, although their environmental and climatic conditions and the level of socioeconomic development are quite close to each other. Research institutions should be requested to evaluate the existing Coordination Plan from the aspect of bilateral and multilateral cooperation in execution of different themes,
- fourth, that on the basis of the agreements made in Dubrovnik, FCFGS (Russia) works on the compilation of a “Catalogue of Common Carp Breeds in Central and Eastern Europe” and its publication in both Russian and English languages. Currently, FCFGS has full information on 14 Hungarian, 11 Russian, 3 Ukrainian, 2 Belarusian and 2 Moldovan breeds of common carp, but there are no data on Polish, Romanian and Czech breeds. Without these data, the Catalogue will not fully reflect the situation of common carp breeds on the European continent. Thus, the Research Institute of Fish Culture and Hydrobiology in Vodnany, the Polish fisheries institutions and the Romanian NACEE members are requested to provide information on common carp breeds to FCFGS according to the approved forms in the shortest possible time. FCFGS is requested to compile and publish in 2008 a “Catalogue of Common Carp Breeds and Crosses in Central and Eastern Europe” in Russian and English with the involvement of all NACEE members,
- fifth, that HAKI and FCFGS are requested to continue to work with the Network of Aquaculture Centres in Asia-Pacific (NACA) on adoption of a „Plan and Programme of Joint Scientific, Technological and Economic Cooperation in Selection and Breeding”, offered to NACA in 2005,
- sixth, that there is a great number of unsolved methodological issues in the field of fish domestication, breed development and improvement, due to which, even ichthyologists and fish breeders are on the opinion that fish is a poor object of selection for economically valuable traits. The latest issues of Aquaculture Europe have published papers by Mr Martin Bilio on domestication in aquaculture that also raise issues for discussion. NACEE members are requested to evaluate the possibility of organising a special workshop on domestication in aquaculture in 2008-2009 and give their suggestions to the Coordinating Institution.

Finally, we have to mention that, during the preparation of the Fourth Meeting of the Board of Directors of NACEE, FCFGS asked all research institutions to give their proposals regarding joint work on genetics, selection and breeding in aquaculture but feedback was received only from FCFGS. The members of the Working Group, recognising the need for joint research, request all NACEE research institutions dealing with this field to send their proposals to FCFGS for discussion during the Fifth Meeting of the Board of Directors of NACEE to be held in Lviv, Ukraine.

PROGRESS REPORT

of the

WORKING GROUP ON NEW SPECIES**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007****1. Background**

The Working Group on “High-value and new species” was established in 2005 during the 2nd Directors Meeting of NACEE in Astrakhan, Russia, together with three other Working Groups (Sturgeon breeding; Fish genetics and selection; Aquaculture education). The “New species” Working Group (the term „High value” in the title of the WG has been dropped) includes four sub-groups according to the following:

Pikeperch, pike and perch cultureLead Centre: HAKI¹, Hungary (lengyelp@haki.hu)Partner institutions: IFA², Bulgaria; IFI³, Poland; VURH⁴, Czech Republic; IF⁵, Belarus; GOSNIORKH⁶, Russia; IZASM⁷, Moldova; ASTU⁸, Russia.***Culture of coregonids***

Lead Center: GOSNIORKH, Russia (niorkh@mail.dux.ru)

Partner institutions: IGC⁹, Belarus; Gosrybtsentr¹⁰, Russia; IFI, Poland***Culture of black carp *Mylopharyngodon piceus****

Lead Center: VURH, Czech Republic (linhart@vurh.jcu.cz)

Partner institutions: IFA, Bulgaria; IF, Belarus; IZASM, Moldova; GOSNIORKH; IF¹¹, Ukraine.***Crayfish culture***

Lead Center: IFA, Bulgaria (thubenova@yahoo.com)

Partner institutions: VURH, Czech Republic; HAKI, Hungary; GOSNIORKH, Russia; IFI, Poland; IF, Ukraine;

¹ HAKI, Research Institute for Fisheries, Aquaculture and Irrigation

² IFA, Institute of Fisheries and Aquaculture

³ IFI, The Stanislaw Sakowicz Inland Fisheries Institute

⁴ VURH, University of South Bohemia, Research Institute of Fish Culture and Hydrobiology

⁵ IF, Institute of Fisheries of the Scientific and Practical Center for Animal Husbandry of the National Academy of Sciences of Belarus

⁶ GOSNIORKH, State Research Institute on Lake and River Fisheries

⁷ IZASM, Institute of Zoology of the Academy of Sciences of Moldova

⁸ ASTU, Astrakhan State Technical University

⁹ IGC, Institute of Genetics and Cytology, National Academy of Sciences of Belarus

¹⁰ Gosrybtsentr, State Scientific and and Production Center for Fisheries

¹¹ IF, Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences

Data of the lead centers and partner institutions, status of ongoing research activities and future plans have been summarised and published. The information is available on the website of NACEE¹ and in the FAO Fisheries Report No. 841, Annex 8.

Although four species have been identified as species of primary importance, the WG is open to establish other sub-groups in case if any NACEE member institution initiates collaboration/networking aiming at the research with an emerging new species.

Since the establishment of the Working Group, there have been initiatives to intensify exchange of information and scientists and also to start joint projects. Information on these activities is also available on the NACEE web site referred to above. Updates on the activities of the sub-groups are summarised in the following chapter.

2. Updates on activities of the sub-groups

Unfortunately only few institutes provided detailed information on activities and collaboration. Based on personal communication with experts in partner institutions, it can be concluded that the activities reported earlier (see FAO Fisheries Report No. 841, Annex 8, which is also available on the NACEE website) continue; however, without significant progress in some institutions mainly due to financial constraints. There have been, however, some new developments and progress in some institutions, which is summarised in the following.

Intensive pikeperch, pike and perch culture

A long-term research agreement has been signed between **Astrakhan State Technical University (ASTU) and HAKI**, an important component of which agreement is joint research on perch. An industrial partner from Hungary, the “Aranyponty” Fish Farm has also been involved in the program. Representatives of HAKI and Aranyponty visited Astrakhan in April 2007 and agreed on the following:

- HAKI will employ Ms. Svetlana Babak from ASTU for a period of two years to assist joint R&D work between ASTU and HAKI on perch rearing;
- Aranyponty Fishfarm will import perch fry from Astrakhan in early 2008 and will carry out rearing experiment in farming conditions. More information: Dr. Laszlo Varadi, E-mail: varadil@haki.hu.

Astrakhan State Technical University (ASTU) has a project (though funding is limited to 2000 USD from local sources) with the title “Development of technology of rearing European perch in industrial conditions”. Although the activity is not confined to pike, pikeperch and perch, ASTU has a larger project on “Optimization of the methods for cryoconservation of the sexual products of breeders of high value species”. The funding (6710 USD) is provided by the Russian Academy of Sciences in the frame of a special program for young researchers. ASTU has published two coursebooks that are relevant to the intensive rearing technology of pikeperch, pike and perch according to the following:

¹ <http://www.agrowebcee.net/subnetwork/nacee/index.php?page=Dubrovnik>

- Industrial Fish Culture, coursebook, Ponomarev, S. V., Grozescu, Yu. N., Bakhareva, A. A., Moscow: Kolos Publishers – 320 p.
- Industrial Aquaculture, coursebook, Ponomarev, S. V., Grozescu, Yu. N., Bakhareva, A. A., Astrakhan: IChP Publishers – 360 p.

More information: Dr. Sergey Ponomarev, E-mail: kafavb@yandex.ru.

The **Institute of Fisheries of the Scientific and Practical Center for Animal Husbandry of the National Academy of Sciences of Belarus** carries out a research programme on pikeperch funded by the National Academy of Sciences, although funding is limited to about 10,000 EUR/year. The program includes the following elements: establishment of pikeperch broodstock; pikeperch reproduction in pond farms; rearing of pikeperch in carp-based polyculture. More information; Dr. Mamedov Rustam Aslan-ogly, E-mail: belniirh@infonet.by; Fax: +375 17 275 3660.

The **Institute of Zoology of the Academy of Sciences of Moldova** has carried out a project “Optimization of the population of pikeperch and pike in Dubasari reservoir for their production in Prut river basin”. The project is funded by the Academy of Sciences of Moldova. During the implementation of the project, a new method was elaborated and patented: “Procedure of embryonic egg incubation in fish glued to artificial substrate” (Patent MD 2946, G2 M kl. A01K 61/00, 2006). The future work will focus on the improvement of reproduction and growth of pikeperch in intensive ponds. More information: Dr. Elena Zubcov, E-mail: zubcov@as.md.

Culture of coregonids

No report has been received by the preparation of the progress report.

Culture of black carp

Only one report from the **Institute of Fisheries of the Scientific and Practical Center for Animal Husbandry of the National Academy of Sciences of Belarus (IF)** had been submitted by the preparation of the progress report. The Institute of Fisheries is a leading institute in research on black carp. The focus of the research is the biological control of schistosomiasis, however one of the research objectives is the investigation of the possible use of black carp in pond polyculture for better utilization of all food niches of the water body. Seven papers have been published on the research that has been carried out between 2004-2006. More information: Dr. Sazanov Vadim, E-mail: savabor@yandex.ru.

Crayfish culture

The Lead Center of this sub-group, the Institute of Fisheries and Aquaculture, Plovdiv, Bulgaria, has published a book "Technology for rearing of narrow-clawed crayfish *Astacus leptodactylus* Esch." with the financial support of the National Center of Agrarian Science. More information: Dr. Tania Hubenova, E-mail: thubenova@yahoo.com.

3. Future plans

Species diversification remains an important issue of the sustainable development of European aquaculture

In the strategy for the sustainable development of European aquaculture, the European Commission states that "enlarging the range of farmed species and strains will create new opportunities and should continue to be actively promoted". However, the Commission warns that "introduction of new species may also lead to the introduction of diseases, both to farmed and wild stocks" and that the introduction of "foreign species may lead to biodiversity threats if the released or escaped exotics take root in their new environment".

The Commission proposes promoting research on new species and strains (i.e. future intentional introductions) and states:

"The Commission believes that research on species diversification is a top priority for both fish and molluscs. Selected new species must necessarily respond to customers' preferences in accordance with new market trends. *Efforts should possibly be oriented to species such as seaweed, molluscs and herbivorous fish, which are able to utilise the primary production more efficiently.* Another priority is the introduction of effective genetic improvement programmes using selective breeding as this will lead to considerable gains in productivity. Introduction of new species should be carried out in such a way to avoid the introduction of diseases... As the introduction of new species for farming, in particular, when they are not indigenous, may also lead to the introduction of diseases, good and careful management practices including preventative measures at farmers' level are essential, in addition to possible legislative implications." The Commission recently brought forward a Proposal for a Council Regulation Concerning Use of Alien and Locally Absent Species in Aquaculture, COM(2006)154, as part of its Strategy for the Sustainable Development of European Aquaculture, COM(2002)511.

The European Commission has also started a consultation exercise on opportunities for the development of aquaculture in the European Union. In the consultation paper, there are a wide range of issues, including:

- the economic outlook of EU aquaculture;
- the environmental challenges facing the industry;
- public health, animal health and welfare;
- **new aquaculture species and opportunities;**
- technological development and spatial planning;
- EU support for sustainability;
- the role of research.

The consultation paper of the European Commission is available on the web as follows: http://ec.europa.eu/fisheries/cfp/governance/consultations/consultation100507_en.pdf.

One of the statements in the paper is that „The range of potential candidate new species for aquaculture is so vast that it is certainly worth continuing with research to identify the most promising ones.” The consultation paper also states that „Species diversification, improved knowledge on basic physiological functions and feed technology and improvement have been, and continue to be, the main subjects for research”. Some projects supported by the EU FP 6 programme have already addressed critical issues related to species diversification, such as

PERCATECH on Eurasian perch (with the involvement of VURH as a NACEE member), LUCIOPERCIMPROVE on pikeperch, <http://www.luciopercimprove.be>, and AQUAMAX on sustainable aquafeeds, <http://www.aquamaxip.eu> (with the involvement of HAKI as a NACEE member).

There have also been efforts by farmers and producers' associations in order to diversify the species range in the production. In the Netherlands, more and more sole, barramundi and even shrimps are produced instead of African catfish and eel. According to the Danish strategic plan for aquaculture, new species will give 10% of the total aquaculture production by 2013. In Hungary there is an increasing interest by farmers in species like striped bass, perch and even barramundi.

Lessons for NACEE institutions and proposed future actions

Although many of the NACEE member institutions are not in EU countries, the majority of the issues related to species diversification are also relevant to non-EU countries of the NACEE region. Moreover, there are significant similarities and common issues between countries in Central and Eastern Europe related to aquaculture development, disregarding whether they are EU members or not. This is due to the similar aquaculture profile, being carp-based pond aquaculture, dominant in most of the countries in the NACEE region. Therefore, the potential and constraints of species diversification (including the introduction of new species) are similar in the countries of the Central and Eastern European region. This is a good common ground for collaboration aiming at the development of rearing technologies of new species, which can be enhanced by the exchange of information between institutions from EU and non-EU countries. In the light of the above, the following is recommended to be taken into consideration during the planning of future activities of the WG on "New species":

- Key experts of the WG should be involved in the consultative process of the European Commission aiming at the development of European aquaculture strategy with special regard to species diversification. The attendance at a conference on "European Aquaculture and its Opportunities for Development" on 15-16 November 2007 is highly advisable. (L. Varadi has been invited to the meeting).
- Communication with non-NACEE institutions, mainly in EU countries, that are involved in research on species diversification, is highly recommended, which would facilitate the involvement in relevant EU-funded projects. Attendance at the "Percid workshop", <http://www.percid.be>, that will be held in Namur, Belgium on 23-24 January 2008 is also recommended.
- Further efforts are needed to develop the existing database of the WG on the NACEE website into a better-structured and searchable database.
- Since there are numerous unpublished reports with valuable information in the partner institutions of the WG, it is recommended to make a list of these reports and then, after evaluation by experts, to translate (if necessary) and to edit the materials for publication. Edited papers can be published either on the NACEE website or in scientific and technical journals depending on the content and quality of the paper.

REPORT OF THE AD-HOC MEETING

of the

“NEW SPECIES” WORKING GROUP

**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)**

Galați, Romania, 27-29 September 2007

Representatives of 13 NACEE member institutions (see list of participants in Annex 7.2.1) attended the meeting that was held in the Natural Science Museum Complex in Galați on 29 September 2007. The main conclusions of the discussions are summarized in the following. Some changes have been decided in the names of the Sub-groups and the assigned lead centres. The new structure of the Working Group (WG) is the following: The coordinating institution of the WG is the Research Institute for Fisheries, Aquaculture and Irrigation (HAKI) in Hungary (varadil@haki.hu). The actual work is carried out in five Sub-groups according to the following:

Predatory species

Lead Centre: VURH¹, Czech Republic (linhart@vurh.jcu.cz)
Partner institutions: HAKI² Hungary, IFA³, Bulgaria; IFI⁴, Poland; VURH, Czech Republic; IF⁵, Belarus; GOSNIORH⁶, Russia; IZASM⁷, Moldova, ASTU⁸, Russia.

Coregonids

Lead Center: GOSNIORH, Russia (niorkh@mail.dux.ru)
Partner institutions: IGC⁹, Belarus; Gosrybtsentr¹⁰, Russia; IFI, Poland

Cyprinids

Lead Center: WAU¹¹, Poland (miroslaw_ciesla@sggw.pl)
Partner institutions: IFA, Bulgaria; IF, Belarus; IZASM, Moldova; GOSNIORH; IF¹², Ukraine; VURH, Czech Republic.

¹ VURH, Research Institute of Fish Culture and Hydrobiology, University of South Bohemia

² HAKI, Research Institute for Fisheries, Aquaculture and Irrigation

³ IFA, Institute of Fisheries and Aquaculture

⁴ IFI, Stanislaw Sakowicz Inland Fisheries Institute

⁵ IF, Institute of Fisheries, National Academy of Sciences

⁶ GOSNIORH, State Research Institute on Lake and River Fisheries

⁷ IZASM, Institute of Zoology of the Academy of Sciences of Moldova

⁸ ASTU, Astrakhan State Technical University

⁹ IGC, Institute of Genetics and Cytology, National Academy of Sciences of Belarus

¹⁰ Gosrybtsentr, State Scientific and and Production Center for Fisheries

¹¹ WAU, Warsaw Agricultural University

¹² IF, Institute for Fisheries of the Ukrainian Academy of Agricultural Sciences

Crayfish

Lead Center: IFA, Bulgaria (thubenova@yahoo.com)

Partner institutions: VURH, Czech R.; HAKI, Hungary; GOSNIORH, Russia; IFI, Poland; IF, Ukraine;

Others

This Sub-group will be operational if a species will not fit into the categories above.

It was agreed that the research work with new species is quite diverse according to its objective. One obvious goal of the work is the introduction of new species in aquaculture, however, another important objective is the propagation and fingerling rearing of indigenous species for restocking (e.g. vimba, chub, barbel, nase). There may also be other objectives of the work with new species such as domestication and biomanipulation. It was decided that a matrix will be prepared by the coordinating institution to survey the aim of the research work particular species by the partner institutions of the various sub-groups. The matrix is shown in Annex 7.2.2. The matrix will be sent to each partner by the end of 2007 to fill their relevant parts. Then the matrix will be finalized after some modifications if necessary. The new information will help to link scientists in order to work on some specific problems taking into account that research groups can be organized not only on the basis of a particular species group but on the basis of a particular problem such as introductions disregarding species.

It was also decided to make a survey on actual research work, initiatives, policies and professional meetings dealing with new species. The Coordinating Institution will provide a preliminary survey by the end of 2007 that will be completed by partner institutions.

Partner institutions will inform each other about their plans and research proposals aiming at work with new species by the end of 2007.

The New Species Working Group will elaborate a webpage that will be built into the NACEE website by the end of 2007.

It was also suggested that a Workshop on New Species can be organized by the WG. However, it requires careful preparation and coordination in order to avoid overlapping with other similar initiatives. The active participation of partner institutions of the WG in relevant professional meetings however is highly encouraged such as the "Percid Workshop" in Belgium on 23-24 January 2008.

Publication of the results in various European journals (e.g. Aquaculture International) and the possible joint publication by partners of the WG is also encouraged.

LIST OF PARTICIPANTS OF THE AD-HOC MEETING**of the****“NEW SPECIES” WORKING GROUP****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galati, Romania, 27-29 September 2007****REPUBLIC OF BELARUS**

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Activity matrix of the Working Group members

	Domestication	Introduction	Commercial production	Stock enhancement	Biomanipulation	Remarks
PREDATORY SPECIES						
VURH						
HAKI						
IFA						
IFI						
IF						
GOSNIORH						
IZASM						
ASTU						
COREGONIDS						
CYPRINIDS						
CRAYFISH						
OTHERS						

PROGRESS REPORT
of the
WORKING GROUP ON EDUCATION (SOUTHERN COUNTRIES)
FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007

The activities were mainly executed between universities from Croatia, Bosnia-Herzegovina, the Czech Republic and Montenegro.

One project proposal, „*Joint studies in aquaculture and fisheries – horizontal and vertical integration*” was submitted to the TEMPUS 2006 call but was rejected. A cooperation between universities in Gödöllő and Dubrovnik was initiated for exchange of teachers and students in the future period in the field of fish reproduction. The University of Dubrovnik started a Master Study on Mariculture and a PhD Study on Applied Marine Sciences together with the University in Split, where colleagues from the universities of Gödöllő and Sarajevo will have courses.

A project is planned that will focus on evaluation of the present and prediction of the future aquaculture development in the Partner country and EU consortium members and evaluation of the present status of aquaculture and fisheries higher education. These data, accompanied by recent achievements in the EHEA aquaculture and fisheries education, will be the base for upgrading of present and development of new curricula in order to fulfill industry needs and to lower governmental spending on education in this sector. Through this project, we will develop an efficient higher education in the sector of aquaculture and fisheries that will be adjusted to industry needs and based on the specificity of each country and will launch joint studies on national and regional levels where it should be appropriate.

The analysis of aquaculture industry development and manpower needs in the future will provide us with basic data on the type and structure of courses and the number of students to be trained and educated, from secondary school level to all levels of higher education. Although secondary education is not an object of this project, one secondary school from Croatia will be a satellite observer due to the initiative of four secondary agriculture and technical schools (Split, Zadar, Karlovac and Opuzen) to start education of aquaculture technicians. As this initiative should be the object of another project, this development will be monitored by the Coordinating Institutions in order to present the educational pyramid of aquaculture and fishery education and to promote vertical integration in each participating country.

Different strategies of the development of joint studies would be elaborated based on similarities and differences among participating institutions and the aquaculture and fishery industries in specific countries. It is clearly evident that in countries where marine culture is dominant, the preference on bachelor level will be given to joint studies between universities from the Adriatic coast (Split, Dubrovnik, Kotor and Tirana), while in countries where freshwater aquaculture is dominant, the joint studies between continental universities (Sarajevo, Vodňany, Gödöllő, Kaposvár and Debrecen) should be preferred. On Master level, the basic idea is to develop and launch joint Master studies between all consortium members, promoting similar principles to the recently established European Master in Aquaculture and

Fishery¹. On the level of doctoral studies, due to the specificity of local industries and targeted research activities for industry support and development, each member will develop own studies and, where possible, joint studies should be elaborated using similar principles as on Master level.

In spite of these different levels of cooperation in joint studies, consortium members should declare intention to recognize all courses and modules in order to promote mobility of teachers and students using the principle of centers of excellence. This way, each university should enhance the quality of its education using teachers and researchers from all partner universities, providing students with wider expertise and knowledge. This will also enhance competitiveness of students on the labour market and provide local industries with more experts. The best examples where this strategy is visible are the module on sperm cryopreservation at the universities of Gödöllő and Vodňany where students from partner countries should learn what they presently do not have at their universities or the modules on mariculture or marine fishery at the universities of Dubrovnik and Split where all students from EU countries and Bosnia and Herzegovina should participate.

All these tasks should be solved by elaboration of the present situation and development and upgrading of the present curricula, courses and modules in aquaculture and fishery higher education. This will be prepared by all participating institutions in the Consortium and discussed, negotiated and accepted by leaders of faculties and departments. The final structure of the new joint studies will be discussed and signed during a Conference of Rectors. This will also initiate a process of recognition of curricula between consortium members as a basic step to start activities in the second year of the project.

All new joint courses in aquaculture and fisheries will be posted on a newly created webpage that will be linked to each partner university and other interesting websites.

The second year of the project is based on promotion of the mobility of students and teachers in the way that one teacher from each university spends two weeks at another university of the Consortium and two students from each university spend three months at another university of the Consortium. The choice of courses for students and teachers will be discussed during regular meetings of the representatives of participating institutions. A selection of these "case studies" based on the principle of "excellence" will be used for a steady mobility practice after evaluation.

The second activity of the second year will be the preparation of teaching materials for specific modules. Three sets of teaching materials consisting of printed books, CD materials, Power Point presentations and selected web materials will be prepared. The courses or modules will be developed in cooperation of selected teachers and researchers from consortium universities and selected based on principles of "best practice and knowledge". Although final decisions will be made during regular meetings, we may predict that these should be: "General Aquaculture and Fishery", "Fish Reproduction", "Genetics in Aquaculture". The language of all materials will be English. These materials should be used later at all universities of the Consortium, as well to the other universities of NACEE network and CARDS countries.

During the second year of the project, the new joint studies will be offered to all universities of NACEE through meetings inside the network in order to spread it in other countries. If a similar project will be executed under the TEMPUS TACIS framework, inter-meetings with this project will be organized.

The project consortium will also try to make influence on the new design of secondary education in the field of aquaculture and fisheries, mainly in establishing aquaculture technicians' education in Croatia, where four schools have an intention to propose it.

¹ <http://www.maqfish.org>

Participating of selected members of higher education representatives in the process of preparation of the proposal should be essential, not only to prepare a sound educational scheme, but also to enable these students for higher education.

This way, by creating completely new joint studies in aquaculture and fisheries in the region, contributing to the secondary education profile and fitting all this vertical pyramid of education in aquaculture and fisheries to the needs of aquaculture industries, this project will provide all participating countries with a realistic situation of this specific activity. This will provide potential students with a clear view on their future careers and new potential in selection of modules and courses through newly established mobility schemes. This will also provide answers to all universities on how many students they should expect in the future and how many teachers and facilities they have to provide.

Through establishing joint studies at different levels of higher education and through promotion of mobility of academics and students among participating universities, the regional horizontal integration of universities dealing with aquaculture and fishery should be achieved. This will be accompanied by signing letters of agreement and recognition of joint courses and modules at each university and by each university. This will provide new knowledge and expertise to each university, and will create a modern and innovative way of learning to new generations of students.

Integrating the aquaculture and fishery education vertically and horizontally in Partner Countries (Croatia, Bosnia and Herzegovina, Montenegro and Albania) and Central European EU countries (Hungary and the Czech Republic) using this project will enable activities inside the NACEE network with the main target to enlarge this integration and to promote EHEA principles toward Eastern European universities.

REPORT OF THE AD-HOC MEETING**of the****WORKING GROUP ON EDUCATION****FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007**

The Working Group briefly discussed and concluded the following:

1. The results of the two educational projects submitted to the TEMPUS call were unsatisfactory and both were rejected. It was decided that, in the next call, both should be restructured according to the referees' remarks and submitted again.
2. Among universities that have signed the Memorandum of Understanding, the exchange of information by means of curricula evaluation and mutual visits of the teaching and administration staff was mainly based on regional approach and their performance could be evaluated as poor. Efforts should be made in the future to promote visits and exchange of ideas.
3. A separate activity dealing with creation of a web database of all NACEE aquaculture and fishery courses is recommended, which will later be linked to a similar EU database.
4. A major obstacle was found in the lack of funds for exchange of students and professors, due to the lack of agreements between states. Actions should be taken at governmental level to conclude such agreements, like the one between Croatia and Ukraine.

ACTION PLAN FOR FOLLOW-UP ACTIVITIES

adopted at the

**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)
Galați, Romania, 27-29 September 2007**

Specific tasks for the members:

- All members are requested to inform the NACEE Coordinating Institution on their educational and training courses, workshops, conferences and other events planned for 2008 so that the Coordinating Institution can compile a plan of events to be discussed in Galați. **Deadline:** 7 September 2007.
- Member institutions that publish scientific or other journals are requested to provide information on these to the NACEE Coordinating Institution (title, address, main topics, required format of papers, etc.). We also ask you to inform us if there is any possibility to publish a special issue of the given journal dedicated to a certain subject. **Deadline:** 31 October 2007.
- We ask all NACEE members to investigate with which NACEE member countries their government has bilateral (or multilateral) intergovernmental scientific and technical cooperation agreements and to send a list of these countries to the NACEE Coordinating Institution (if possible, with a link to the webpage, where further information can be found). HAKI will synthesize the information in a table and make it available for all members. **Deadline:** 30 November 2007.
- NACEE members are requested to communicate to the Coordinating Institution detailed information on the principal subjects on which they are ready to organize training courses (either for groups or for individual researchers). They are also asked to provide a list of their scientists indicating their main field and whether they are ready to provide training in the framework of an exchange programme or a training course. **Deadline:** 30 November 2007.
- In order to make NACEE's R&D potential more visible, members are requested to communicate to the Coordinating Institution:
 - a list of their scientific and technical results that may be of interest for other countries;
 - a list of promising innovative projects that need investment from either state or private donors.

The information will be published on the NACEE website. **Deadline:** 31 December 2007.

Specific tasks for the Coordinating Institution:

- To compile a plan of events (educational and training courses, workshops, conferences, etc.) to be organized in 2008 by NACEE members for discussion in Galați. **Deadline:** 21 September 2007.
- To inform NACEE members on publication opportunities in journals of other NACEE members. **Deadline:** 30 November 2007.
- To synthesize the information on bilateral (or multilateral) intergovernmental scientific and technical cooperation agreements between NACEE countries in a table and make it available for all members via e-mail and the NACEE website. **Deadline:** 31 December 2007.
- To collect data on the main specialization of NACEE member institutions and their scientific staff and to compile it into a public searchable database to be discussed at the Fifth Meeting of NACEE Directors. **Deadline:** 31 August 2008.

General guidelines for members:

- Provide relevant information regularly to the NACEE Coordinating Institution. If a piece of information concerns only few institutions, then information can be sent to them directly, with a copy to the Coordinating Institution. The Coordinating Institution will inform other NACEE members by e-mail and through the webpage. Important information will also be published in the Eurofish Magazine.
To make this request more specific, we suggest that the responsible persons for this task should be the NACEE liaison officers in each institute, and that the deadline for submission be set as the 10th day of every second month starting with 10 December 2007.
- All member institutions should use their knowledge on each other's activities and competences to locate NACEE partners for participation in project consortia. The NACEE Working Groups provide excellent framework for the elaboration of international project proposals on cross-cutting issues.
- NACEE members should provide more information to their non-NACEE partner institutions on NACEE's activities. Whenever there is interest from non-NACEE institutions on participation in NACEE, members should inform them on the availability of „associated membership”. For further information, they should contact the NACEE Coordinating Institution.
- More events of different kind (educational and training courses, workshops, conferences, etc.) should be organized by NACEE members. Joint organization of such events by two or more institutions should also be considered if it helps reducing the financial and other difficulties associated with the organization. The NACEE Coordinating Institution should be informed on the planned event already in the planning phase to ensure that the dates do not coincide with any known important aquaculture-related event. Early information also helps to ensure higher participation of other NACEE members. Whenever possible, the hosts should try to attract other NACEE members by offering them reduced participation fees (especially for young

scientists). On the other hand, NACEE Directors should support as much as possible the participation of their staff (especially young scientists) in other NACEE members' events.

- Participation of fishermen and people directly associated with fisheries and aquaculture in the NACEE courses should be supported. Whenever courses that can be of interest for fish farmers and practical specialists are offered, NACEE members should disseminate this information to farmers in their countries.
- Members are encouraged to submit papers both to journals like Aquaculture International or Aquaculture Europe and to each others' journals (a list will be provided later).
- Members are requested to include a point „On the results of the NACEE activities” into the agenda of the annual evaluation meetings of their Scientific Councils.
- NACEE members are highly encouraged to join the European Aquaculture Society
- Language constraints are a serious issue within the CEE region. Members should recognize the fact that international events all over the world are held in English. In several NACEE member institutions, the knowledge of English is a basic precondition when employing young scientists, without which one cannot work as a researcher. Russian-speaking institutions should probably also follow this practice.

UPCOMING EVENTS OF SPECIAL IMPORTANCE**FOURTH MEETING OF DIRECTORS OF THE NETWORK OF AQUACULTURE
CENTRES IN CENTRAL-EASTERN EUROPE (NACEE)****Galați, Romania, 27-29 September 2007****BELARUS****August 2008****International scientific-practical conference****«The strategy of development of aquaculture in modern conditions»**

Minsk, Belarus

Contact: belniirh@infonet.by

HUNGARY**21-22 November 2007****IMPASSE Workshop on****Management of Alien Species for Aquaculture, Fisheries and Environment**

Szarvas, Hungary

Contact: Galina Jeney, jeneyg@haki.hu

3-7 December 2007**FVM/HAKI-CGIAR/WFC Workshop on Carp Genetics**

Szarvas, Hungary

Contact: Zsigmond Jeney, jeneyz@haki.hu

POLAND**5-7 March 2008****Actual status and active protection of endangered natural populations of sturgeons**

Przysiek, Poland

Contact: Ryszard Kolman, kolrys@infish.com.pl

16-19 September 2008**Aquaculture Europe 2008 – „Resource Management - Natural, human and material
resources for the sustainable development of aquaculture”**

Krakow, Poland

Contact: eas@aquaculture.cc

RUSSIA**April 2008****Modern methods of molecular genetic analysis in fisheries selection and breeding**

Moscow, Russia

Contact: fsgcr@ipc.ru; bogeruk@elnet.msk.ru

August 2008**Pedigree fish breeding: current status, problems and ways of development**

St-Petersburg, Russia

Contact: fsgcr@ipc.ru; bogeruk@elnet.msk.ru

OTHER INTERNATIONAL EVENTS**23-24 January 2008****Percid Fish Aquaculture**

Namur, Belgium

Contact: percid@fundp.ac.be

Webpage: <http://www.percid.be/introduction.htm>**19-23 May 2008****World Aquaculture 2008**

Busan, Korea

Contact: worldaqua@aol.com

Webpage: <http://www.was.org>**21-24 May 2008****EIFAC Symposium on Interactions between Social, Economic and Ecological Objectives of Inland Commercial and Recreational Fisheries and Aquaculture**

Antalya, Turkey

Contact: devin.bartley@fao.org

Webpage: <http://www.fao.org/fi/eifac.htm>

FISH CULTURE RESEARCH AND DEVELOPMENT CENTER

Nucet, 137335, judetul Dâmbovița, Romania
Tel.: + 40-245-267-009; Fax: +40-245-267-003

Director: Mioara COSTACHE

NACEE liaison officer: Mioara COSTACHE (scp_nucet@yahoo.com)

About the Center

The Fish Culture Research and Development Center Nucet came into being in 1941 at the initiative of Grigore Antipa. In more than 60 years of its existence, Nucet Center has made an essential contribution to the development of pisciculture in Romania. About all that was concrete and important made in Romanian pisciculture (acclimatization of new species, original technologies for artificial reproduction (with licences), polyculture rearing technologies, creation of industrial races and hybrids of carp, genetic manipulations), was made inside of Nucet Center.

One of the most important achievements of the post-1990 period is the foundation and development of a collection of freshwater fish species and races, which actually has nearly 30 genetic entities represented by nearly 90 stocks of different ages, being by far the most important from the country and even from Europe.

As from 1992, the acclimatization of North-American paddlefish, *Polyodon spathula*, originary from the hydrographic basin of Mississippi river, received principal attention, being of ample freshness and economic importance for Romanian economy. It is a freshwater sturgeon with a big size (as 2 m length and 70 kg weight), fast-growing, and the most important aspect for the technological and economic part, it is not a feed consumer.

In 2002, the first artificial reproduction experiments were achieved with affirmative results, which represent a big achievement for the fish culture research from Romania. The biological material for stocking obtained this year, will prevail at almost 20 fish farms from Alba, Arad, Calarasi, Arges, Iasi, Vaslui, Constanta, Dolj and Tulcea counties. By the results of the research done in 10 years and by the number of kept individuals of this species, C.C.D.P. Nucet comes to the third place in the world after U.S.A. and China and is at the first place in Europe.

The current scientific research programs refer to:

- Application of genetic manipulation (gynogenesis, androgenesis, poliploidy, reversal of sexes);
- Conservation of freshwater fishes in the “Genetic collection”;
- Optimization of artificial reproduction technologies for cultured fish;
- Elaboration of ecological technologies for rearing of fish;
- Elaboration of artificial reproduction and rearing technologies for valuable species of fish, as wels, tench, pike, pikeperch;
- Introduction of the North-American paddlefish *Polyodon spathula* in rearing farms of Romania.

In addition to specific outcomes of scientific work, as special articles, publications, scientific communications, the Center also does important small-scale production of selected biological material – freshwater fry, fingerlings and breeders.

The Center produces and sells yearly about 200 million fry and about 40 tonnes of fingerlings of the next species:

- Carp (*Cyprinus carpio*) – 3 races (Fresinet, Ineu, Ropsha) and 6 industrial hybrids;
- Koi carp (*Cyprinus carpio*) – different colours;
- Paddlefish (*Polyodon spathula*);
- Silver carp (*Hypophthalmichthys molitrix*);
- Bighead carp (*Aristichthys nobilis*);
- Grass carp (*Ctenopharyngodon idella*);
- Black carp (*Mylopharyngodon piceus*);
- Tench (*Tinca tinca*);

- Crucian carp (*Carassius auratus gibelio*);
- Pike (*Esox lucius*);
- Pikeperch (*Stizostedion lucioperca*);
- Wels (*Silurus glanis*).

All these species and, moreover, crayfish, frogs, shellfish and different species of zooplankton are available on demand as experimental material for biological and toxicological laboratories.

C.C.D.P. Nucet owns the greatest stocks of *Polyodon spathula* in Europe. *Polyodon spathula* is a freshwater sturgeon, native from North-America which presents a big aquaculture potential. It is stipulated to introduce this species in rearing culture in the next 2-3 years.

The Center provides technical assistance for aquaculture, controlled and artificial reproduction of fish, efficient aquaculture exploitation of dams, ecological rehabilitation of aquatic ecosystems. The Center's specialists can provide assistance and quick interventions for aquaculture farms and also can make feasibility studies for setting up or rearrangement of aquaculture exploitations.

Facilities and Personnel

The Center has 110 ha of ponds, from which, about 70 ha represent the main experimental base, situated around the premises. The other 40 ha represent 2 nursery farms for rearing of fingerlings, situated at 5-8-km distance from the premises. The Center possesses 3 stations for artificial reproduction with a production capacity of 200 million fry/year, tanks for conditioning of breeders and a circulated tank for artificial controlled reproduction of Chinese fish. The facilities also include technological aids necessary for any modern aquaculture farm: vehicles, boats, fishing nets, mill. The complex work of research and small-scale production is logistically supported by two workshops and a thermic station.

The center has 70 employees, from which, 10 are scientific researchers and work in four research collectives, fish genetics and improvement, aquatic ecology, reproduction physiology and ichthyopathology and aquaculture technologies. The research collectives use the hydrochemistry and biochemistry, genetics and improvement, hydrobiology, physiology and ichthyopathology laboratories. The experimental work is done in all 5 experimental bases (ponds) and the 3 stations for artificial reproduction.

The Center's library has about 10000 textbooks and about 20000 periodicals, being specialized in fish biology and aquaculture. More than 100 periodical publications are received every year on the basis of subscription, in exchange or as donations.

Genetic entities owned by Fish Culture Research and Development Center Nucet

1. Carp (*Cyprinus carpio*) – Fresinet race
2. Carp (*Cyprinus carpio*) – Ineu race
3. Carp (*Cyprinus carpio*) – Ropsha race
4. Carp (*Cyprinus carpio*) – Koi race
- 5-7. Carp (*Cyprinus carpio*) – consanguinous lines of Fresinet, Ineu and Ropsha races
- 8-11. Carp (*Cyprinus carpio*) – industrial hybrids of Fresinet, Ineu and Ropsha races
12. Intergenetic cross-bred carp (*Cyprinus carpio* – Fresinet race) × crucian carp (*Carassius auratus gibelio* “new form”)
13. Ornamental crucian carp (*Carassius auratus gibelio*)
14. Silver crucian carp (*Carassius auratus gibelio*)
- 15-23. Gynogenetic and hybridogenetic lineages of crucian carp females (*Carassius auratus gibelio*)
24. Tench (*Tinca tinca*)
25. Grass carp (*Ctenopharyngodon idella*)
26. Black carp (*Mylopharyngodon piceus*)
- 27-29. Silver carp (*Hypophthalmichthys molitrix*)
- 30-31. Bighead carp (*Hypophthalmichthys (Aristichtys) nobilis*)
32. Bigmouth buffalo (*Ictiobus cyprinellus*)
33. Black buffalo (*Ictiobus niger*)
34. Wels (*Silurus glanis*)
35. Channel catfish (*Ictalurus punctatus*)
36. Pikeperch (*Stizostedion lucioperca*)
37. Pike (*Esox lucius*)
38. Paddlefish (*Polyodon spathula*).

**NATIONAL INSTITUTE FOR MARINE RESEARCH AND DEVELOPMENT
"GRIGORE ANTIPA" (NIMRD)**

*300 Mamaia blv. 900581 Constanța, Romania
Webpage : <http://www.rmri.ro>*

General Director: Simion NICOLAEV
NACEE liaison officer : Tania ZAHARIA (zahar@alpha.rmri.ro)

1. Position in the national R&D system

NIMRD is the technical operator of the national network for physical, chemical and biological monitoring of national marine and coastal waters and of the surveillance of coastal erosion.

2. Main mandate:

To develop fundamental, applied and technological research on:

- Oceanography
- Marine and coastal engineering
- Ecology
- Environmental protection
- Management of marine living resources: Aquaculture and Ecological Reconstruction

- To fulfill (according to the Governmental Law 686/1999):

- National and international requirements of the Romanian Exclusive Economic Zone (about 24,000 km²) at the Black Sea;
- Obligations assumed by Romania as a part of international conventions in those fields.

3. Staff (by qualification):

Total: 115

Scientists: 54 (full-time); 16 with PhD

4. Budget (structure of income)

About 104 411 Euro (2006);

Total R&D expenditure: 495 000 Euro

5. Main research areas

The basic research fields include: marine hydrology, marine physics, marine chemistry, marine biochemistry, sedimentology, coastal morpho-dynamics, marine biology, microbiology, marine living resources, coastal engineering and technology, ecological protection.

NIMRD hosts the Black Sea Regional Activity Centre for Environmental Aspects of Fisheries and other Marine Living resources Management (RAC FOMLRM), created in 1994.

Also, the Institute hosts the following four Focal Points, corresponding to the Black Sea Activity Centres Network: Biodiversity, Pollution Monitoring and Assessment, Pollution from Land Base Resources, Methodologies for ICZM.

6. Events organized regularly by the institute

National Scientific Symposium with the international participation is organized every 2 years. The last one took place in 2005 with 60 participants from various research institutes and organizations from Romania, Bulgaria, France, Italy, United Kingdom etc. The next symposium will be in October 2007.

7. International collaboration:

- ☞ UNESCO / Intergovernmental Oceanographic Commission
- ☞ International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM)
- ☞ Food and Agriculture Organization (FAO)
- ☞ General Fisheries Council for the Mediterranean Sea (GFCM)
- ☞ Balkan Environmental Association (B.EN.A)
- ☞ GEF / BLACK SEA ENVIRONMENTAL PROGRAMME

- ☞ Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)

8. National and international responsibilities:

a) At national level:

- Assures the co-ordination and location of the Romanian National Committee of Oceanography/National Commission of Romania for UNESCO;
- Assures activity of the Permanent Technical Secretariat of the National Coastal Zone Committee;
- Assures the custody of Marine Reserve 2 Mai – Vama Veche.

b) At international level:

- Co-ordinates activities of the Regional Activity Centre for Environmental Aspects of Fisheries and Other Marine Living Resources Management and other five National Focal Points within the framework of the International Programme “Environmental Management and Protection of the Black Sea/ Global Environment Facility”/ GEF Black Sea;
- Co-ordinator of the activity of the International Secretariat for South-eastern Europe of Balkan Environmental Association/ISSE-B.EN.A.;
- Assures the Vice-presidency of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area/ ACCOBAMS;

9. Involvement in EU projects

- Nutrient Management in the Danube Basin and its Impact on the Black Sea (DANUBS)
- Conservation of the Dolphins from the Romanian Black Sea Waters (LIFE 00 NAT/RO/7194)
- A Regional Capacity Building and Networking Programme to Upgrade Monitoring and Forecasting Activity in the Black Sea Basin (ARENA)
- European Lifestyles and Marine Ecosystems (ELME)
- International Action for Sustainability of the Mediterranean and Black Sea Environment (IASON)

Projects in preparation:

Some national and international projects.