WWF Polska Foundation: position on the construction of the barrage in Siarzewo

WWF Polska Foundation, for more than 20 years, has made efforts to develop the solutions of serious environmental and social problems posed by the barrage on the Vistula River in Włocławek based on solid scientific grounds, in a participatory process to guarantee the involvement of environmental NGOs. Unfortunately, such a discussion concerning the future of the Włocławek Barrage and the Włocławek Reservoir has never taken place. Instead, untruthful information has been disseminated for years about the importance of the Włocławek Barrage for the management of the flood risk and about the need to build a further barrage on the lower Vistula River in Siarzewo to 'support' the ageing Włocławek Barrage.

The risk of a serious ice-jam flood in the Włocławek Reservoir in February this year showed yet again that a long-term, fact-based and economically viable concept to definitely solve the problems caused by the Włocławek Barrage is still missing. Therefore, for reasons connected with the safety of the residents of Płock, Włocławek area and of the Vistula valley upstream the Włocławek Reservoir and for the sake of the unique natural values of the Vistula River and the rationality of public spending, WWF Polska Foundation shall state as follows:

1. **The planned barrage in Siarzewo is not material to flood protection whatsoever.** For the flattening of the wave of flood, its relevance is neutral at most and in certain situations it can even increase the flood risk as modelling results have demonstrated – in consequence of the construction of a reservoir downstream Włocławek, the flood wave in the Lower Vistula may culminate even to a higher extent than before it was created[1].

2. **The construction of a further barrage on the Vistula River will exacerbate the problem of ice-jam floods.** The Włocławek Reservoir generates a serious

flood risk by increasing the ice-jam risk, an example of which was the ice-jam flood on the Włocławek Reservoir in 1982 and the risk of ice-jam flood in Płock in February 2021. After the construction of the barrage in Siarzewo, ice jams will have to be coped with in two places at the same time.

3. **The construction of the barrage in Siarzewo will aggravate the problem of drought.** Dammed reservoirs retain water in one place, disturbing its distribution to the surrounding areas. Below the reservoir, the erosive force of water washes out the material from the bottom, which lowers the bottom level. This reduces the water level in the river and consequently, the groundwater level as well, thus causing local droughts. Water in the reservoir stands still, it is not being carried by the water stream, so it warms up and evaporates faster than the water running in the river.

4. **The Włocławek Barrage, despite the serious erosion of the Vistula's bottom downstream the barrage, bears no risk of construction disaster and there is no need to build another barrage on the Vistula River to 'support' the Włocławek Barrage** as:
    a. in the years 2013 – 2015, for the amount of about PLN 115 million, the Włocławek Barrage was renovated, which improved the technical condition of the facilities of the Włocławek barrage[2];
    b. Even if it is assumed that in order to guarantee the lasting safety of the barrage in Włocławek, an elevation of the water level below this barrage is indeed necessary, this objective does not require a construction of the barrage in Siarzewo. The same effect of elevating the water level and 'supporting' the Włocławek barrage can be reached by constructing a small weir located at a distance of several hundred metres below the dam of the Włocławek barrage. Such a solution will have significantly less negative effects for the environment and for the residents than the construction of the Siarzewo barrage.

5. **The construction of a power plant on the barrage in Siarzewo IS NOT relevant for the Polish power sector and it is UNECONOMICAL**:
    - the investments costs of the installation of 80MW turbines on the Siarzewo barrage are six times higher than investments in solar or wind energy. The same amount of energy can be generated in this part of Poland using alternative methods that are less harmful to the environment – by combining the investments in solar & wind energy and in biogas power plants

- The resulting energy mix would not only be less harmful to the environment than a hydroelectric power plant, but it would also be much better suited to Poland's energy requirements as:
    a) In the case of the hydroelectric power plant on the Vistula River, the lowest yearly energy production occurs in summer months due to the low water level in the river; in this same period, limitations to the production of energy from coal power plants located along the Vistula River occur due to the problems in delivering the required amounts of cooling waters;
    b) The maximum energy from the combined production of solar, wind and biogas power plants is reached precisely in summer months and thus such an energy mix responds much better to the energy demand and better stabilizes the country's energy system.

5. **The construction of the barrage on the lower Vistula River in Siarzewo would fail to comply with the Polish and EU legislation[2]** as:

a. it will have a significant impact on at least three Natura 2000 areas: Włocławska Dolina Wisły [Włocławek Vistula Valley], Nieszawska Dolina Wisły [Nieszawa Vistula Valley] and Dolina Dolnej Wisły [Lower Vistula Valley][2] ;
b. it will jeopardize the implementation of the environmental objectives of at least 4 River Surface Water Bodies: the Vistula from the Wda to the estuary, the Vistula from the Sierzchów tributary to the Wda, the Vistula from the Region Wodny Dolnej Wisły border [Lower Vistula Water Region] to the Sierzchów tributary and the Vistula from the Włocławek Reservoir outlet to the Region Wodny Środkowej Wisły border [Middle Vistula Water Region], which jointly constitute the whole Vistula section from the barrage in Włocławek to the estuary into the Baltic Sea.
c. the chance to achieve good water status as required from the EU member states by the Water Framework Directive will be missed. This investment does not satisfy the conditions of any of the derogations from achieving the objectives of the Habitats Directive and the conditions of any of the derogations from achieving the environmental objectives of the Water Framework Directive, as each of the public interests that would be pursued through the construction of the barrage in Siarzewo (e.g. relating to energy production, transport) can be implemented by alternative means, less harmful to the environment and with economic rationality.

6. **The construction of the barrage on the lower Vistula in Siarzewo will jeopardize the implementation in Poland of the HELCOM Action Plan for sturgeon**, to which Poland has committed under the HELCOM Convention, CITES and the Habitats Directive as the construction of the barrage and reservoir will have the following consequences:

a. the chance to restore the 'migration tract' (green corridor) that the lower Vistula offers to the Acipenser oxyrinchus sturgeon will be definitely lost – even in spite of the construction of effective fish ladders, the sturgeon will not be able to overcome the ecological and behavioural barrier posed by the dammed reservoirs with a total length of about 80 km;
b. convenient sturgeon spawning habitats that have been created in the eroded Vistula section downstream the Włocławek barrage will be irreversibly devastated.

7. **The construction of the barrage in Siarzewo will also increase greenhouse gas emissions.** The organic matter is deposited in the central and lower part of the dammed reservoir and it decomposes in the summer under anaerobic conditions, which causes the release of greenhouse gases (including methane) and toxic substances (ammonia, hydrogen sulphide). Studies have shown[3] that the share of greenhouse gases released per one unit of energy produced can be in the case of hydroelectric power plants (dammed reservoirs) even 4 times higher than in the case of the conventional coal-fired power generation. Furthermore, the Włocławek Reservoir already has the highest methane ebullition rate from among all the dammed reservoirs in Poland[4] (i.e. the release of gas bubbles in the shallow parts of the reservoirs) and the construction of another reservoir next to the former one will aggravate the problem only.

8. **Currently, over 50% fish species in Poland are threatened with extinction or their presence depends on human activities[5] (e.g. stocking). The construction of the Siarzewo barrage will only deteriorate the situation**:

a. 69,601 km of rivers will be cut off for fish migration, including diadromous fishes that are extremely endangered: their populations have already decreased by 93% and the barrage will only deepen the decrease and consequently, it will lead to a biodiversity crisis;
b. it will prevent the migration and consequently, it will lead to a collapse or to entire extinction of the population of sea trout, salmon and vimba bream in the Vistula basin (the Włocławek barrage only has already enormously limited the migration of these species);
c. dammed reservoirs created in the aftermath of a partition of the river with a barrage constitute an excellent reservoir of alien and invasive species.

The sole Włocławek reservoir already contains 7 invasive fish species and 2 invasive bivalves species[6,7]. The Siarzewo Reservoir will aggravate the problem and it will enhance their further spread in the Polish waters, in combination with a displacement of indigenous species. Studies show clearly that the presence of alien species is up to 300 times higher in dammed reservoirs than in natural lakes. The Polish ichthyofauna is made up of about 30% alien and invasive species and this trend will be growing with the global warming.

9. The construction of the Siarzewo reservoir will have a positive impact on the development of tourism only in its first years of existence, then its impact will become **significantly negative (and such impact will increase with each passing year) by threatening with cyanoses that are toxic for humans and animals and with massive chironomids (Chironomidae) hatch that is disturbing to humans.**

a. The reservoir will be shallow, with a large surface, it will warm up quickly and there will be a large amount of water-flooded and decaying organic matter on the bottom, which will create ideal conditions for toxic cyanobacterial blooms. Cyanobacterial blooms will virtually appear in the Siemianówka Reservoir every year causing that the Reservoir will be out of service for many days, which includes swimming and fishing, the main driving force for the local tourism.
b. The massive emergence of chironomids is a headache for the residents of the areas near the Włocławek Reservoir already now[8,9] including Płock, causing that the investments and tourist attractions of the place (for example summer houses and marinas) are becoming useless. The emergence of the chironomids in 2016 caused that the residents of Płock did not leave their homes in the evening and tightly closed the windows. Furthermore, the costs to remove the chironomids hatches are so high that such actions are being renounced already now. The shallow Reservoir that warms up quickly creates perfect conditions for the development of larvae in the Włocławek Reservoir – the construction of another, similar Siarzewo Reservoir will exacerbate the problem, hindering the development of tourism in this region.

WWF Polska Foundation is firmly opposed to the construction of the barrage in Siarzewo as it will not solve the problems related to the bottom erosion and the disrupted functioning of the river downstream the barrage in Włocławek, nor will it ensure flood protection. The investment will destroy several dozen kilometres of the

valuable and unique Vistula River; it will have a negative impact on many habitats within the whole catchment basin and it will contribute to a dramatic reduction of migratory fish population. The construction of the barrage in Siarzewo will constitute a material breach of the EU legislation – the requirements of the Water Framework Directive and of the Birds Directive and the Habitats Directive.

[1] WWF Polska Foundation. 2012. Evaluation of the impact of the Włocławek reservoir and of the planned barrage and reservoir in Siarzewo on the conditions for transmission of great waters based on the flood from May 2010. Typescript. Warszawa. https://straznicy.wwf.pl/wp-content/uploads/2018/10/Stopie%C5%84_Siarzewo_W%C5%82oclawek_znaczenie_dla-zarz%C4%85dzania_ryzykiem_powodziowym-1.pdf

[2] Appeal by WWF Polska Foundation against the decision no. 124/2017 of the Regional Director for Environmental Protection in Bydgoszcz of 29.12.2017., reference no.: WOO.4233.3.2016.KŚ.29

[3] https://www.sciencedirect.com/science/article/abs/pii/S0169534717302380

[4]https://www.researchgate.net/profile/Adriana-Trojanowska-Olichwer/publication/256304070_EMISSION_OF_METHANE_FROM_SEDIMENTS_OF_SELECTED_POLISH_DAM_RESERVOIRS/links/00b7d5224667f32c25000000/EMISSION-OF-METHANE-FROM-SEDIMENTS-OF-SELECTED-POLISH-DAM-RESERVOIRS.pdf

[5] https://www.iop.krakow.pl/files/66/spis_pelne_teksty_1_2009.pdf

[6] Radtke G., Bernaś R., Płąchocki D., Prus P., Wiśniewolski W., 2018. Czy tama we Włocławku nadal wpływa na ichtiofaunę dolnej Wisły? Niektóre dane ichtiologiczne i środowiskowe. Roczniki naukowe polskiego związku wędkarskiego 31: 21-56.

[7] Bonk M., Bobrek R., 2017. Kolejne stwierdzenie szczeżui chińskiej w dorzeczu Wisły. Wszechświat (1) 7: 214-215

[8] http://petronews.pl/roje-ochotek-nad-wisla-w-nocy-wygladaja-jak-snieg/

[9] http://petronews.pl/ochotki-nie-do-usuniecia-zbyt-wysokie-koszty/