

The 2002 Floods in the Czech Republic and their Impact on Built Heritage

Disastrous floods that surpassed all historical records hit a vast area of Bohemia in August 2002. Hydrologists estimate that the water reached peak levels corresponding to a 500-year flood. Approximately 505 towns and villages were flooded, including cities whose historic cores are protected as conservation areas; two of them, Prague and Český Krumlov, are listed on the UNESCO World Heritage List (fig. 1–3). In five regions of the Czech Republic the government had to declare a state of emergency during the floods, which enabled it to take extraordinary measures (fig. 4–10). The gross estimate of the damage incurred is 3 billion Euros, of which Prague is supposed to have suffered losses of about 330 million Euros.

Since stone, brick and lime were the usual building materials in Bohemia from the Middle Ages onwards, our soundly built historic towns as well as churches, castles, country houses and other important components of our built heritage survived the floods in surprisingly good condition. Fortunately, only a few really important monuments with valuable artistic decoration were seriously damaged.

The broader summary of the flood's impact on the stock of non-listed vernacular buildings, which nonetheless represent a traditional way of construction, is by far not so optimistic. In contrast to the monumental stone and brick structures, vernacular houses in villages and suburbs were frequently built with adobe (raw-brick) or different second-hand materials joined with a very lean mortar. The flood had a fatal impact on such buildings. A large number of them collapsed immediately, many others had to be pulled down because of serious cracks and other irreparable structural damages. In my view any building, even the poorest traditional building, has become irreplaceable because of globalization and standardization of present-day building production. Therefore, the collapse of so many traditional buildings must not only be considered as a material loss, but also as a great and irreversible cultural loss.

The collections of museums and art galleries, libraries and archives suffered immensely. Unfortunately, the depositories of these institutions were frequently located in the basements and ground floors of their buildings. Many valuable items from these collections were lost, a great part of them was salvaged from the stinking mud in a very damaged condition and stored provisionally in capacity deep-freezers.

What failed most during the floods was risk preparedness



Fig. 1 Prague, Malá Strana, Nostic Palace, an important Baroque palace from the 17th century, featuring rich decorations of its interiors from the first third of the 18th century. The palace was flooded up to a height of 50 centimeters. Consequently, all wooden floors on the ground floor were destroyed, the walls were waterlogged and the wooden doors were damaged.



Fig. 2 Prague, Karlin. In the historical quarter St. Cyril and Methodius Church, an important work of neo-Romanesque architecture by Ignacius Ullmann, was flooded. Water rose there to a height of 1.6 meters, damaging the wall paintings and all movable objects.

and on-time information. In areas with frequent floods people have never stored any goods and materials of high value in the cellars and ground floors of their houses. They have always left the roof space of their houses free to be able to transfer their belongings there from the lower floors

Fig. 3 Český Krumlov, historical centre of the Conservation Area. As one of the most complex town cores from the Gothic and Renaissance periods, it was listed on the UNESCO List of World Cultural and Natural Heritage in 1992.



in the case of a flood. When the flood was over they never removed the plaster but patiently waited until the walls had become dry again. Then they lime-washed the rooms and cellars and put the furniture back.

This wise practice, the result of long experience, was completely forgotten in recent times. During the last ten or twelve years the value of the houses situated in the central parts of the cities, including the inundation zones, has increased enormously. The owners therefore have not left an inch of usable space unused. They installed new offices or flats in the roof spaces and opened shops or various pubs, taverns, bars etc. with expensive equipment in the basements and cellars.

The result was that when the flood came, they had no chance to move their belongings to a safe place. The situation was even worse since no evacuation plans existed. For decades, the citizens of Prague had lived with the false conviction that the vast system of dams on the Vltava River would completely protect the city against high water. A warning and information on the enormous scale of the coming flood was released by the authorities only a couple of hours before the catastrophe. Immediately after that people had to be evacuated in the shortest time possible, so that they had to leave all their belongings behind. To prevent looting the police made flooded quarters inaccessible for a couple of weeks. If people had been informed earlier and if the evacuation had been better prepared, owners could have saved much of their property. The losses of movable cultural properties in museums could also have been minimized.

For the authenticity of historic buildings, the period after the flood is perhaps even riskier than the disaster itself. Serious problems started when the contractors and producers of building materials used the opportunity to extract money from the situation. They started a fierce

campaign offering their services and products to the owners of flooded buildings. Their aim was to repair the affected buildings not only on the necessary scale, but in the form of a radical reconstruction. They suggested ripping out all the plaster and replacing wooden elements such as floors, windows, doors, in many cases even ceiling timbers with steel, plastic and other modern materials. This was done without any serious assessment as to whether the suggested interventions were justified by truly bad conditions of the elements that were to be replaced. The financial help given to the victims of the flood by the state even accelerated this process. The badly needed money was often wasted on unnecessary interventions, depriving the traditional buildings of their former beauty, authenticity and the feeling of age.

The position of the professional state conservators in the process of eliminating flood damages was not an easy one. We organized colloquia and specialist meetings on how to treat buildings affected by water. With the participation of the best specialists from the Technical Universities in Prague, Brno and Ostrava as well as of the most experienced conservators, we produced booklets containing useful know-how and practical advice on how to treat the affected buildings considerately and with adequate respect for their material authenticity. The booklets were distributed to a large number of concerned state and municipal authorities free of charge.

Nonetheless, in the tense atmosphere after the flood these activities failed to work. In the newspapers and other media the conservationists were described as notorious troublemakers who were making the uneasy, sometimes rather tragic situation of people deprived of all their properties even more difficult. Our well meant technical advice was frequently taken as an »undue« or even »impertinent« interference into the owner's rights and interests. We



Fig. 4 Stará Hlína, the Inundation Bridge, a masonry bridge from 1781, historically located in the Třeboň pond system. Part of the bridge collapsed; it is necessary to reconstruct the bridge pillar as well as two bridge spans.

practically lost our struggle against building contractors and their massive publicity. Finally, since we found no support among the state authorities, including the Ministry of Culture, our part in the after-flood recovery of the country nearly collapsed. We had to focus our efforts only on the handful of first-rate monuments owned by the state. After difficult negotiations, we were able to cooperate positively with some municipal authorities when municipal property was concerned and with the churches. In the case of private proprietors, however, we became practically powerless.

The results of this situation were rather sad: a number of fully reparable traditional buildings pulled-down without sufficient reason and hundreds of them mutilated by the »reconstructions« mentioned above. A very dangerous after-flood process could be observed in some big cities: real estate speculation. Many owners and developers who wished to invest in the historic centres of towns tried to put their houses into the category of so-called »irreparably damaged structures« to be allowed to pull the houses down and replace them with larger buildings no longer used for housing (with rents regulated by the state), but for more lucrative offices, commerce and parking.

There is another field in our post-flood situation which deserves a critical comment. It is our unpreparedness to accept and efficiently use the help from abroad offered immediately after the flood was over. Only a few clerks working for the authorities can speak English. The result was that they preferred to wait until the money from the state budget came and did not bother to accept rather complicated foreign help. In this context I would like to express my thanks from the bottom of my heart for

extremely generous financial and material help that came from Great Britain, Germany and Switzerland. Among others it helped to save and restore an extremely valuable archive of architectural drawings and plans which was in the care of the National Technical Museum in Prague. After this very brief description I would like to give some conclusions and generalizations derived from our experience.

First of all we must realize and get used to the fact that the floods are going to come again and again in the future. We must become much better prepared. The terrible losses caused by the last flood could have been much less had the human factor not failed so blatantly.

- No factories and storehouses producing or storing oil and chemicals should be located in the inundation areas (a strong opposition and lobbying against this idea is under way); no big chemical plant has been transferred to a safer place yet.
- In houses threatened by floods no valuable objects, equipment or goods should be stored. All items of cultural value should be definitely transferred away from inundation areas (this principle has already been partly fulfilled by the state museums and archives).
- Historic buildings of stone or brick can resist high water without serious consequences. Such buildings hardly need any special protective interventions. It is better to let the water flow in and out of them rather than to mutilate them by protective walls. A very wise measure proved to be that of the Hilton Hotel which



Fig. 5 Písek, the oldest medieval stone bridge in Bohemia from the period after 1250 with Baroque sculptural decorations. The bridge was completely under water, the breastwork walls made of granite square stones and one copy of the Baroque statues collapsed because of the flood.



Fig. 6 Liběchov, historic country house and park, an important Baroque building by the excellent Czech architect F. M. Kaňka, built about 1730, with a park established in a formal style and decorated with numerous sculptures. The historic country house was flooded up to a height of 3.5 meters. Very valuable wall paintings by the well-known Czech painter Josef Navrátil are in critical condition. The valuable park was devastated and muddied.



Fig. 7 Terezín, fortress. The original fortifications are based on Baroque fortification systems of the 17th century. During the August 2002 floods, Terezín and surroundings were flooded up to a height of 3 meters. The historically valuable underground protection system of the fortress was also badly damaged.



Fig. 8 Veltrusy, historic country house area and landscape park, an important work of the high Baroque period from the first half of the 18th century, probably designed by the important architect F. M. Kaňka or G. B. Alliprandi. The Veltrusy historic country house was flooded up to a height of about one meter. Interior plasterwork in the ground floor, wall paintings and valuable decorations in the sala terrena were damaged. The landscape park is completely destroyed

filled its basement with clean water, thus avoiding having it fill with dirt and mud.

- It is not good to rely exclusively on protective walls or mobile barriers; the water finds its way into the buildings nonetheless in the form of »subterranean rivers« of subsoil water penetrating also through the drainage and sewerage, through collectors and other man-made ways. In my opinion, good risk-preparedness

programmes and individual well-prepared and trained evacuation plans are more effective than the barriers whose function may have very bad side-effects (e.g. water penetrating from drainage can create lagoons which are difficult to exhaust).

- The flood water is heavily contaminated; during all rescue operations strict hygienic rules must be followed.



Fig. 9 Děčín, stone bridge in the late medieval Gothic style with a sculptural group of St. Vitus, St. John of Nepomuk and St. Wenceslas by the sculptor M. J. Brokof from 1714. One of the pillars was damaged by the flood and the bridge statics was affected.



Fig. 10 Štětí, area of St. Simon and Juda Church, 1785. Church foundations at the sidewall were undermined; plasterwork, stone components and movable objects are damaged.

- After a flood it takes a long time before subsoil water levels drop again. This process should not be speeded up. Premature pumping out of water from the cellars can result in cracks and other structural problems.
- The drying of wet masonry is also a slow process. It is possible to speed it up by carefully chosen means (heating, ventilation, dehumidifiers). In the case of murals, stucco decorations and other artistic elements the assistance of specialists is absolutely necessary. Experience has proved that removing lime plaster has no speeding effect and that only building contractors will benefit from it. On the other hand, it is highly advisable to remove all cement plasters, oil paints and other vapour-proof materials from the walls. The same applies to materials used on the floors.
- High humidity supports the growing of all kinds of

mould and rot. It is advisable to dismantle and remove all wooden elements from the flooded rooms and let them dry and be specially treated in a separate place. After the appropriate treatment these elements can be returned later to their original place and can continue to fulfil their function without any problems.

- The post-flood condition of culturally valuable buildings and objects and all rescue operations should be carefully documented (photographs, sketches etc.).
- Floods generate emotions, hysteria and unpredictable reactions not only on the part of the victims but among the entire population. People tend to make unreasonable decisions and unobjective judgements. Especially those who objectively speaking are to be blamed will soon start looking for scapegoats. Conservationists are often among the first to be unjustly accused.