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САША ДМИТРУК / АРХИТЕКТУРА / 04 ЖОВТНЯ 2024



As a result of Russian attacks in Ukraine, more than 160,000 private and multi-storey residential buildings have been destroyed. Each shelling leaves a lot of debris: according to official figures alone, there are about 700,000 tons of construction waste in the country. Today, there is literally nowhere to dispose of it - landfills are overflowing. To prevent us from drowning in garbage, we need to either recycle it or think about how to reduce its amount; alternatively, we can build housing from natural eco-materials that can be composted. The second scenario is also important because, in the face of climate change, new architecture must become sustainable.

The German-Ukrainian project HOPE HOME • НАДІЯ, initiated by Berlin-based-curator Adrienne Goehler, wants to approach all these global problems. She came to Ukraine with her team and teamed up with Kyiv-based architect Sofia Galat to promote eco-friendly practices in construction. As part of the project, they have already held dozens of online workshops about of natural building materials and organised as consequence an exhibition /Materialshow with these materials in Kyiv. In the future, they have the ambitious plan to spread eco-friendly practices among communities affected by shelling. "HOPE HOME • НАДІЯ has developed from her traveling exhibition, which after 13 years, specially emphasized on CO₂ neutral building materials. PRAGMATIKA.MEDIA spoke to the project team and learned how to create a raw material base for a large-scale reconstruction from hemp, clay, reeds, and mushroom mycelium.

Who is Adrienne Goehler and how it all started

Adrienne Goehler is a Berlin-based freelancer and former president of the University of Visual Arts Hamburg. For the last 14 years, she has been organising art projects, exploring the aesthetics of sustainabilities and eco-practices. She seeks out eco-initiatives from around the world and tries to present them through the lens of art. Goehler, who also previously was Senator for Culture and Science in the state of Berlin

understands how to work with political, social and climate crises. Climate issues are reflected in her largest art project, "Models для Role"/examples to follow/ Zur Nachahmung empfohlen.



Adrienne Goehler, curator of the HOPE HOME • НАДІЯ, project, former president of the University of Fine Arts Hamburg, Photo: Natalia Azarkina

In Berlin, 2023 she opened the last exhibition within this project, with the focus on eco-materials and their use. Together with the artists, Goehler conveyed the message that pure natural materials can be part of everyday life and helps our mental and physical health. The exhibition received a lot of feedback locally, so Goehlers team decided to take the project beyond the German context and bring it to Ukraine to scale it up here. “We’ll go where it really, really matters”. According to Adrienne Goehler, this is more important in Ukraine now because of the global devastation caused by Russian attacks. Sofia Galat, who acts as the project manager on the Ukrainian side, helped immerse the German curator in the Ukrainian context. Galat is a Kyiv-based architect and researcher who studies alternative materials and their use in architecture. Together they have built up a German-Ukrainian team of architects, artists, farmers, biologists and brands, ready to become part of the project. In spring 2024, a joint collaboration between the German curator and the Ukrainian architect gave birth to HOPE HOME • НАДІЯ, a project whose main idea is to offer alternative natural materials (hemp, straw, clay, reeds, willow, wool, and mushroom mycelium) for the reconstruction of Ukrainian villages and towns and to show that this process can actually be environmentally friendly and sustainable.



Adrienne Goehler, Sofia Galat, and Maksym Kashuba, head of the Mykolaiv Military District Administration, after an intense workshop signing a Memorandum about the reconstruction of villages with natural materials for in the region. Photo: Natalia Azarkina

By offering an alternative material base for reconstruction, the HOPE HOME project plans to fight the "cartel" - as she calls the global concrete construction industry, which uses unecological technologies and is responsible for 40% of the world's CO₂ emissions. "This is a cartel that is trying to enter Ukraine by all means. But we are showing an alternative. That is why we decided to bring our exhibition on eco-materials here to Ukraine, where it is really important. It seems to me that you already have a lot of things to suffer from. So why should you also suffer from excessive CO₂ emissions?" says Adrienne Goehler.

Another goal of the project is collaboration and exchange of experience. "HOPE HOME-• НАДІЯ" started six months ago and has since brought together about 50 specialists and researchers from both countries. In particular, scientists from the Technical University of Berlin - architect and head of the laboratory of Natural Materials, Eike Roswag-Klinge and his colleagues Moritz Henes or Folke Köbberling, an artist, teaching architects in Braunschweig and being a specialist on wool joined the project. Together they taught workshop participants how to make building materials from hemp, wood and wool. "In conditions where wood as a raw material is very limited, we can use plant fibres - hemp, flax, cotton. The easiest way is to use fibres as insulation materials. But we are going further. We are talking about making support structures from fibres," Eike Roswag-Klinge told PRAGMATIKA.MEDIA.



Eike Roswag-Klinge, architect at the Technical University of Berlin. Photo: Natalia Azarkina

In total, the teams have already held 10 online workshops, which were open to everyone, including people who plan to build their own eco-house. "In fact, anyone can work with these materials, all you need is raw materials and instructions. We are trying to spread these practices not only among architects and designers, but also among people who want to rebuild their own homes," comments Sofia Galat and adds that one of the communities in Mykolaiv region will be rebuilt using eco-materials as part of the project.



The exhibition as part of the HOPE HOME project was held at the House of Architects in Kyiv. Photo: Natalia Azarkina

What was shown at the exhibition of natural building materials

The main offline event within the HOPE HOME • НАДІЯ project was exhibition of natural building materials which was held at the House of Architects in Kyiv from 25 to 29 September. It showcased modern building materials and structures made exclusively from natural raw materials. The concept of the exhibition was generated by Adrienne Goehler: according to the German curator, all exhibits are presented in the form of a paravan - interconnected wooden panels, each of which contains a sample of a building material and demonstrates its properties. All materials are made from local Ukrainian raw materials, although it was originally planned that the German team would bring exhibits to Kyiv from Berlin. However, the German hemp, clay, and straw were delayed due to increased border controls.

For this reason, the project authors decided to make exhibits from Ukrainian materials and engaged local manufacturers. In this way, Ukrainian brands interested in promoting eco-friendly products in Ukraine were able to join the project. In particular, the products were presented by Glinko (clay and loam building materials), Hempire (a company that builds eco-houses from hemp), Reedkli (building materials made from reeds) and Straw Panel Factory (manufacturer of straw panels). The exhibition featured bricks made of natural clay (Glinko), roof and wall insulation made of hemp and reeds (Hempire, Reedkli), as well as panels made of fire-rock concrete (Hempire) and straw (Straw Panel Factory), which can be a full-fledged alternative to wall partitions and even exterior walls.



The photo shows eco-friendly bricks made of natural clay by the Ukrainian brand Glinko. Photo: Natalia Azarkina

One of the most sustainable innovative materials presented at the exhibition is a biocomposite material made from hemp stalks mixed with clay limestone. The material's advantages are its high thermal insulation capacity, fire resistance and,

ultimately, its environmental friendliness: hemp absorbs a large amount of carbon from the air, which reduces greenhouse gas emissions to almost zero. But the most important advantage of the hemp concrete panels is the lower risk of injury compared to concrete. "Hempire has conducted tests that have confirmed that the core concrete panels are capable of stopping a bullet and small fragments. But the most important thing is that when they collapse, they do not injure people because they are light and crumble. We are currently working on new state construction standards, so it is important to talk about the use of this material at the legislative level," Galat said.

As the project also has artistic components, art installations were presented during the exhibition. In particular, the work of Ukrainian artist Alevtina Melnychuk, who made handwashers from a shell tube, rethinks the use of war waste. "This practice can go beyond the artistic context. For example, the tube can be used as a material for musical instruments - there are projects that are already doing this. Or for making furniture. My installation encourages us to think about how to reuse this material in the future, because when the war is over, there will be a lot of such waste," the artist comments.



Benjamin Förster-Baldenius, artist and architect, head of the Frankfurt School of Art, works with re-use of war material Photo: Natalia Azarkina

Another art installation was presented by German artist Alexa Kreissl. She used tetrapak packaging for her work, making decorative compositions from them: "Tetrapak is a very stable material that can be reused in many different ways, it is open to transformation. You just have to come up with your own vision." The tetrapak for the German artist Alexa Kreissl was provided by the Ukrainian company "No Waste Ukraine" The exhibition at the

Chamber of Architects was open until 29 September, after which the exhibits were moved to the building of the KNUBA Faculty of Architecture.



Artist Alexa Kreissl works with a tetrapack provided by the project No Waste Ukraine Photo: Natalia Azarkina

The optimal scenario. Why the transition to eco-raw materials is important

Project manager Sofia Galat joined the project because she has long been researching eco-materials in architecture and their impact on the environment. "This project intersects with both my values and the direction of my research. I am writing my dissertation on biomimicry in architecture. Biomimicry promotes the use of exclusively natural resources for innovation. In simple terms, this branch of science believes that all the answers to all questions are already in nature, we just need to find them and use them in everyday life," says Galat, who in her research is investigating the use of mushroom mycelium for making brick blocks.

In the US and Australia, these biotechnologies have been explored for a long time, and The Living, a building made of "mushroom" blocks that was built in New York in 2014, is a clear proof that mushroom mycelium works in construction. To make these blocks, wood shavings or corn husks are used - these waste materials are combined with specially developed mushroom mycelium and placed in brick moulds. In a few days, the mixture turns into a hard and durable, yet very lightweight material. In 2014, the Embodied Computation Lab team created 10,000 of these bricks and built a 13-metre tower out of them. The structure was then dismantled, and the bricks were recycled into compost and donated to local community gardens.



The Living project, constructed from blocks grown with mushroom mycelium. Photo: Cecil Barnes V

There is no alternative to using eco-materials in construction and composting them, says Galat. Today, Ukraine is the world's leader in terms of demolition waste. As of June 2024, only the government-controlled territory has amassed a total of 700,000 tons of construction waste. Most of it is in Kyiv, Zhytomyr, Sumy, Mykolaiv, Kherson, Chernihiv and Kharkiv regions. In Donetsk and Luhansk oblasts, the amount of waste is impossible to calculate. With the country "drowning in construction waste" and solid waste landfills at 94% capacity, we have two scenarios: recycling or composting construction waste. The latter is much more environmentally friendly and promising.

"If we assume that a new building is 90% made of environmentally friendly materials, then when it collapses, the ruins do not become construction waste but turn into compost, because they are completely organic. In extreme cases, the remains can be crushed and scattered on the field. All the building materials we provide within the project are biodegradable materials that will not pollute our land. This should be understood not only by the project participants, but by everyone: both the state and developers," Sofia emphasises.



Equipment removes construction debris caused by Russian shelling. Gostomel. Photo: Neo-Eco

The use of eco-materials is relevant not only in the context of construction waste. This is a global trend that has spread to Western and European countries, where even developers are trying to introduce innovations that reduce their carbon footprint. After all, the construction industry is among the top industries that produce the most CO₂, which accelerates climate change. "When a country that has suffered so much from the consequences of war needs help, now is the best time to offer an alternative to capitalist architecture and construction. Concrete production is responsible for 40% of all CO₂ emissions in the world and threatens us with environmental disaster. Confronting this industry is one of the main motives of my project," Adrienne Goehler said in a comment to PRAGMATIKA.MEDIA.

After all, the use of eco-materials such as clay, straw and reeds is traditional for Ukrainian architecture and construction, and the return to authentic practices and their rethinking is part of the national consciousness today, says Sofia Galat: "Recreating traditional methods and even transforming them into new ones, rethinking them, is not only relevant but also necessary now. That is why we see an extraordinary demand among people."



Artist Alexa Kreissl with the participants of the workshops. **How to talk to sceptics** Photo: Natalia Azarkina

"We are like Davidae and Goliath: on the one hand, the reinforced concrete industry, and on the other hand, a small team of strong women and men in architecture who wants to change a lot. But in fact, it is necessary to do so, because when you have someone to follow, it is much easier to implement changes. In fact, we are trying to become those who will be followed. This fits very well with Adrienne's principle of creating a "role model". That is, we are creating a pilot project that can become an example for many others," says Sofia Galat about the ambitions of HOPE HOME • НАДІЯ, adding that the project has no target date for completion: "We have plans for the next five years."



Technique for making bark concrete, an eco-material made from hemp and clay. Photo: Natalia Azarkina

When asked how the team communicates with those who are sceptical about the ideas of eco-friendly construction, Sofia Galat answers: "So far, we have not encountered such people. We tell people about ourselves, hold lectures and workshops, and when people learn about us and see how everything works, they are no longer sceptical. If we talk about the experience of our partners, for example, Hempire, it is usually not them who are looking for clients, but their clients who are looking for them. We do the same: we bring it to those who are interested, not vice versa."



Straw panels from the Ukrainian brand Straw Panel Factory. Photo: Natalia Azarkina

Sofia's opinion is supported by the project's curator Adrienne Goehler: "Concrete production is a mass industry, concrete is the cheapest and therefore most accessible raw material in this area. But this needs to be changed, the industry needs to be gradually reoriented towards renewable materials, and this needs to be communicated to people who understand it and who will talk about it. Of course, we can't start building skyscrapers in Kyiv from straw or hemp right now, but we can start with small towns and villages where it is really important."



Eike Roswag-Klinge, architect at the Technical University of Berlin, in a workshop with students.
Photo: Natalia Azarkina

European integration and, as a result, Ukraine's transition to international standards in construction and certification of developers can be a strong argument against sceptics, says Eike Roswag-Klinge, head of the Natural Materials Laboratory at the Technical University of Berlin, who joined the project as an expert in clay and wood. One such standard is ESG criteria - compliance with environmental, social and governance standards. These criteria will be taken into account by international donors and development companies when making decisions about investing in Ukraine.

"In the end, I think that fossil, non-renewable building materials will gradually increase in price on the global market, while green technologies will become cheaper. And smart investors are now starting to look to the future because they are building for themselves and their children. They understand that the next generation will also live in the spaces they are creating now. They are thinking differently, and such investors are the future," says Eike Roswag-Klinge.

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