



Funded by
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NBS tools



About

The trans4num NBS Tools were developed in Hungary's Szigetköz region to help farmers, students, educators and local communities better understand how Nature-based Solutions (NBS) can improve soil health, water retention, biodiversity and agricultural resilience.

Rather than traditional teaching materials, the tools combine:

- storytelling,
- scientific observation,
- visual demonstrations,
- and interactive experimentation.

Users are encouraged to touch, test, compare and explore real agricultural processes through practical learning experiences.

Developed through collaboration between researchers, educators, environmental organisations and students, the tools transform complex environmental concepts into accessible and engaging learning journeys.



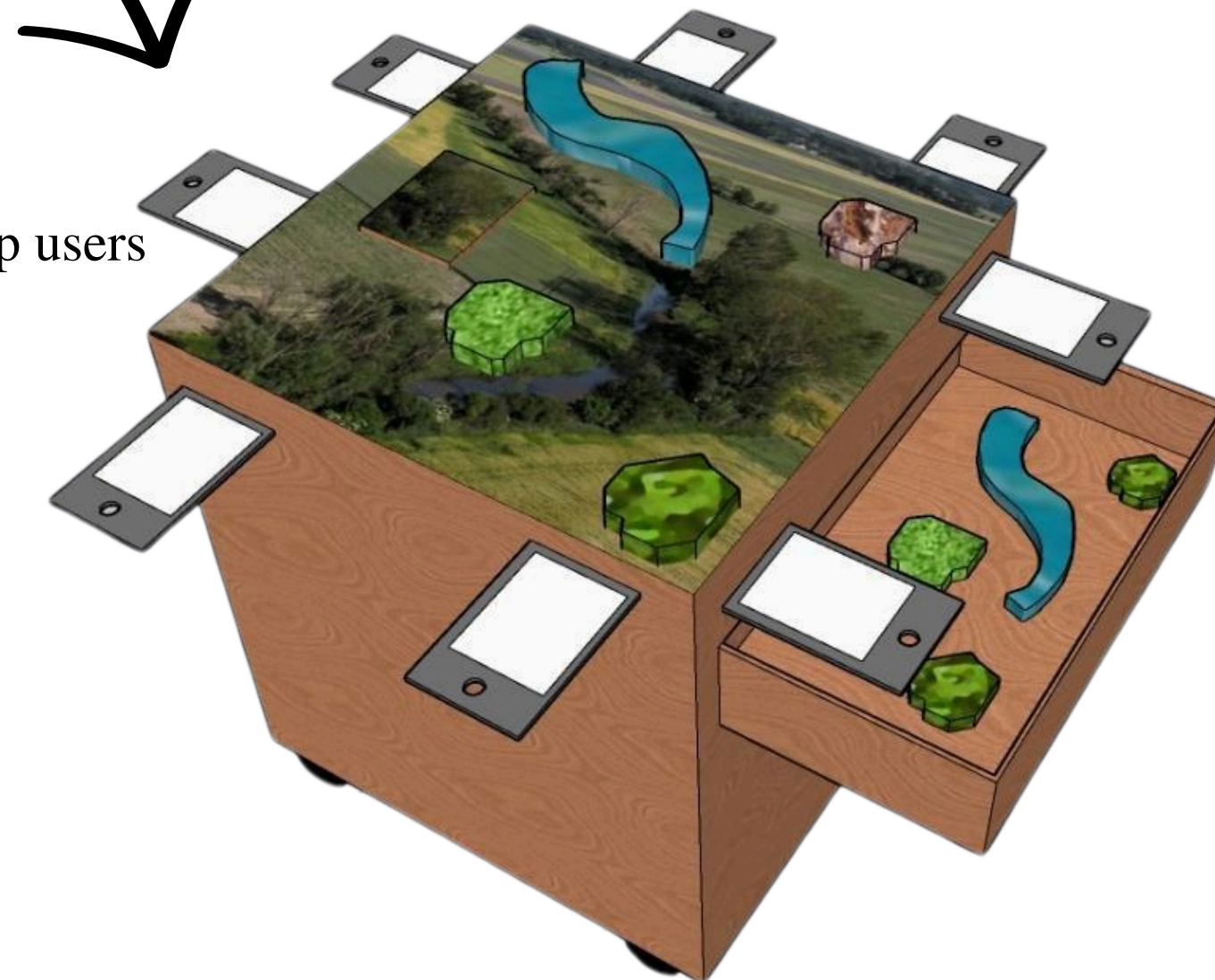
1. Challenges in Agriculture - mock-up landscape

What it shows?

A model landscape showing:

- soil erosion,
- dust storms,
- compaction,
- water imbalance,
- and degraded farmland.

Stories and comic style illustrations help users explore real agricultural challenges.



Why it matters?

Helps users:

- observe problems,
- understand causes,
- and connect farming practices with environmental impacts.

Encourages critical thinking and discussion.

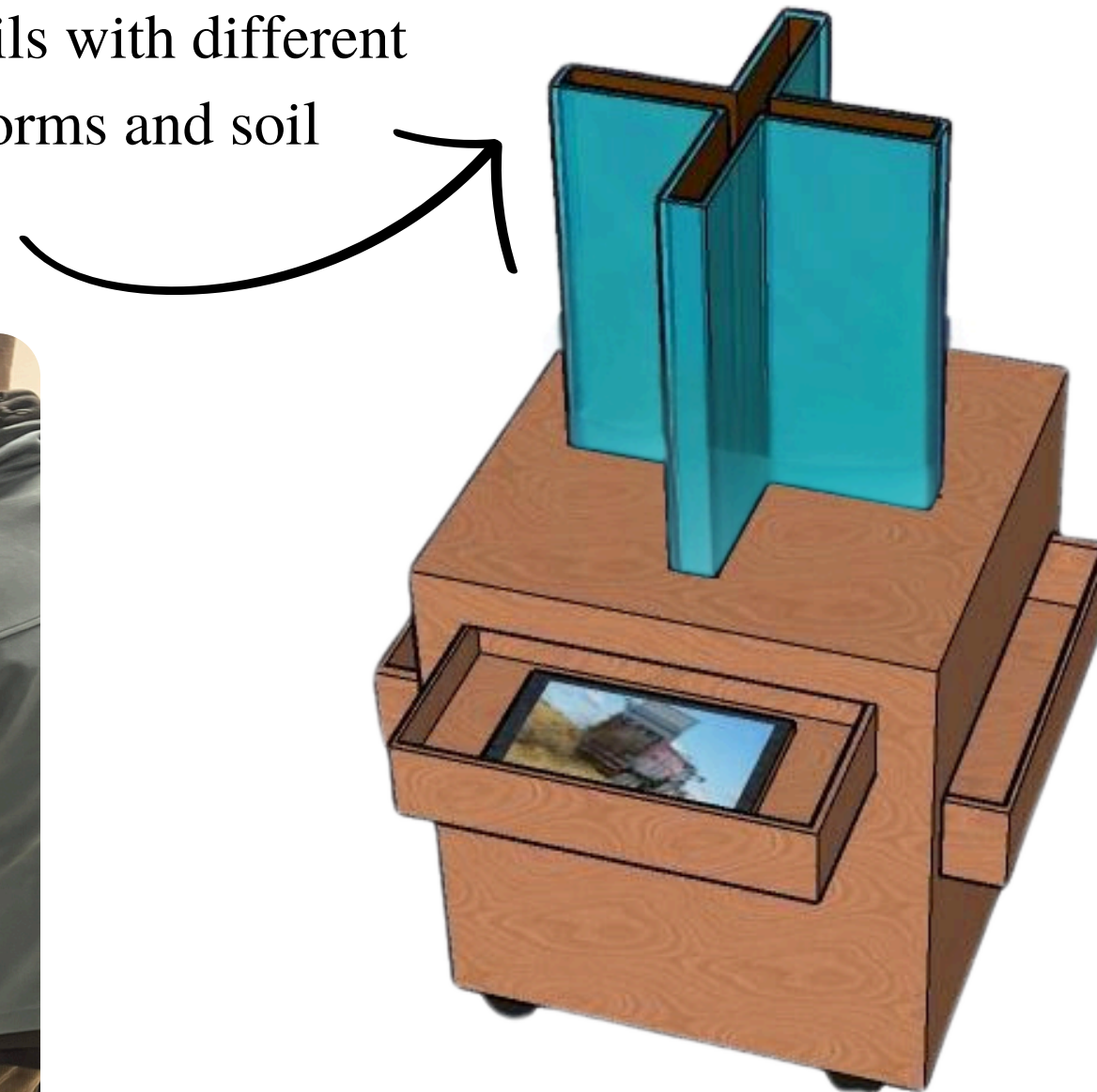


2. Soil life and Chemistry tool

Nature-based Solution → Reduced chemical inputs and improved soil management practices.

What it shows?

A star-shaped display comparing soils with different levels of chemical sue and where worms and soil life thrive.



Why it matters?

Healthy soil biodiversity is essential for long-term fertility, nutrient cycling, and resilient farming systems.



3. Soil Water Holding & Permeability Test

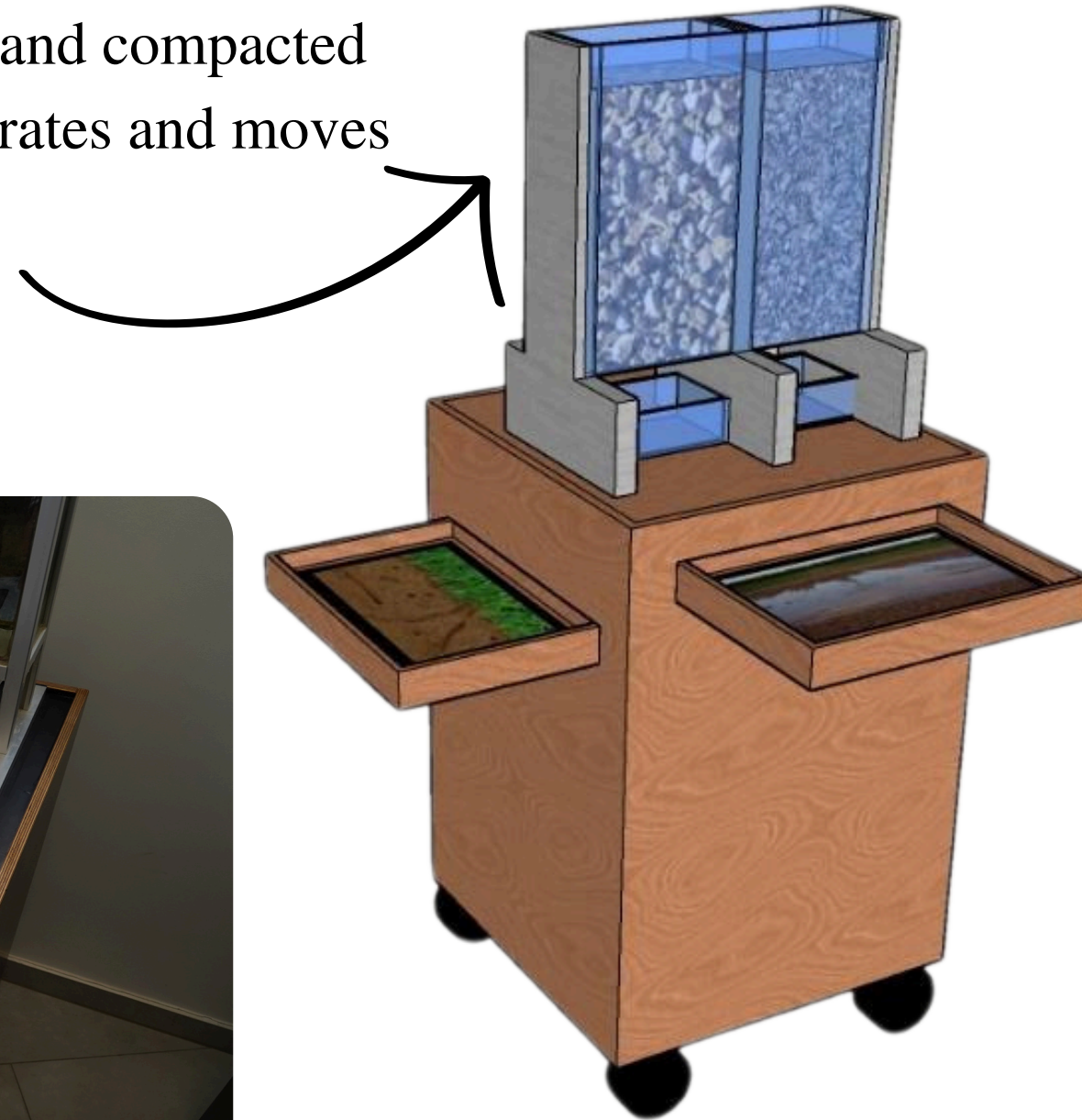
Nature-based Solution → Soil regeneration and improved soil structure.

What it shows?

A side-by-side comparison of loose and compacted soils demonstrating how water infiltrates and moves through different soil structures.

Why it matters?

Healthy soils improve water retention, reduce runoff, and increase resilience to droughts and heavy rainfall.

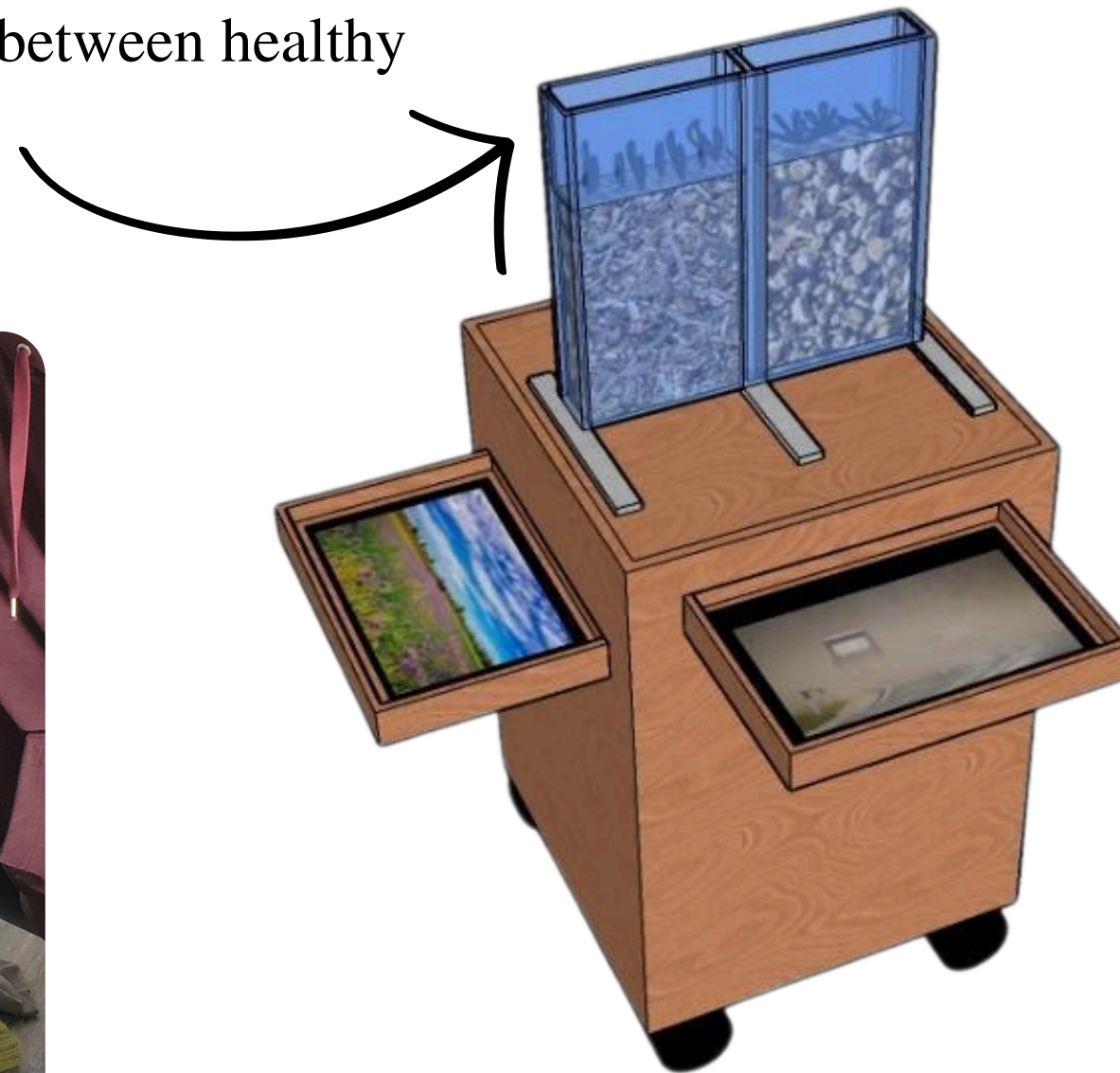
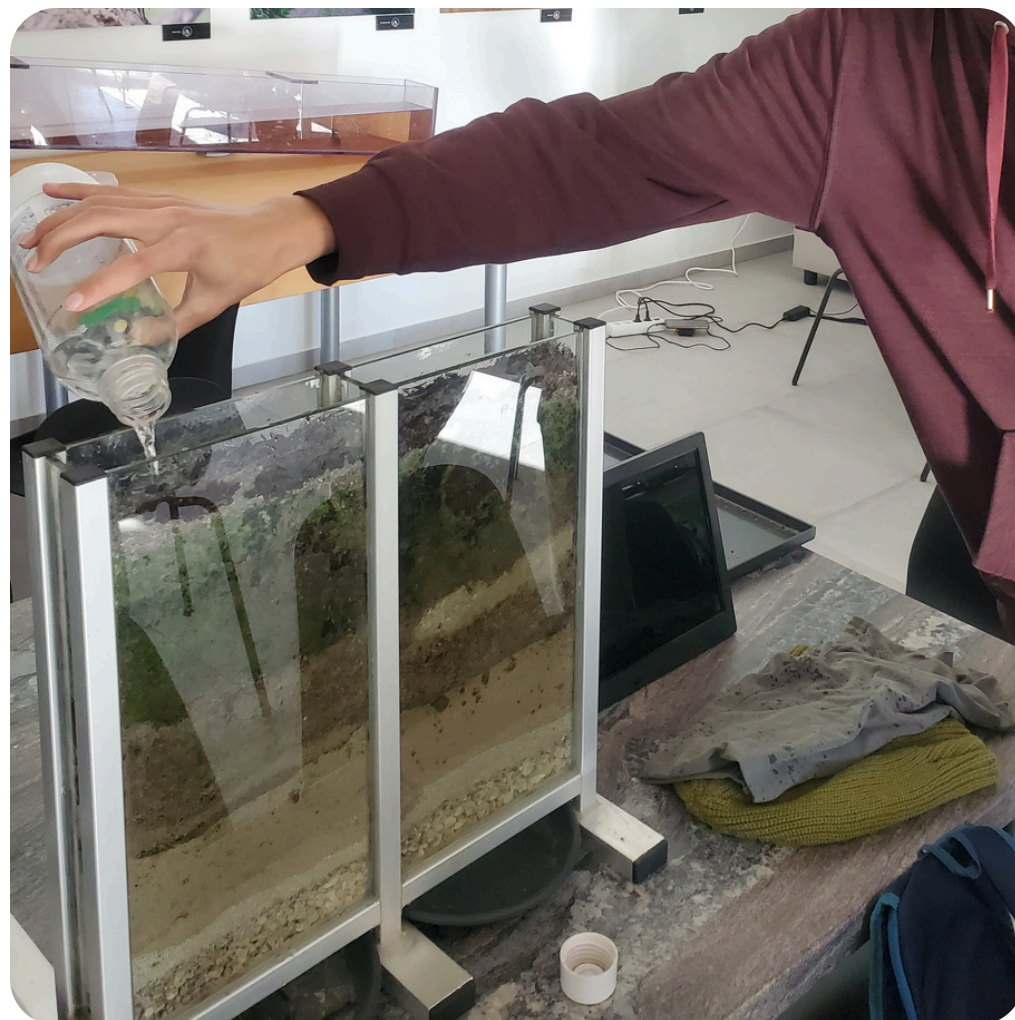


4. Soil compaction tester

Nature-based Solution → Reduced tillage, soil regeneration, and careful machinery management.

What it shows?

The difference in root development between healthy and compacted soils



Why it matters?

Compacted soils limit plant growth, reduce water infiltration, and negatively affect long-term productivity.

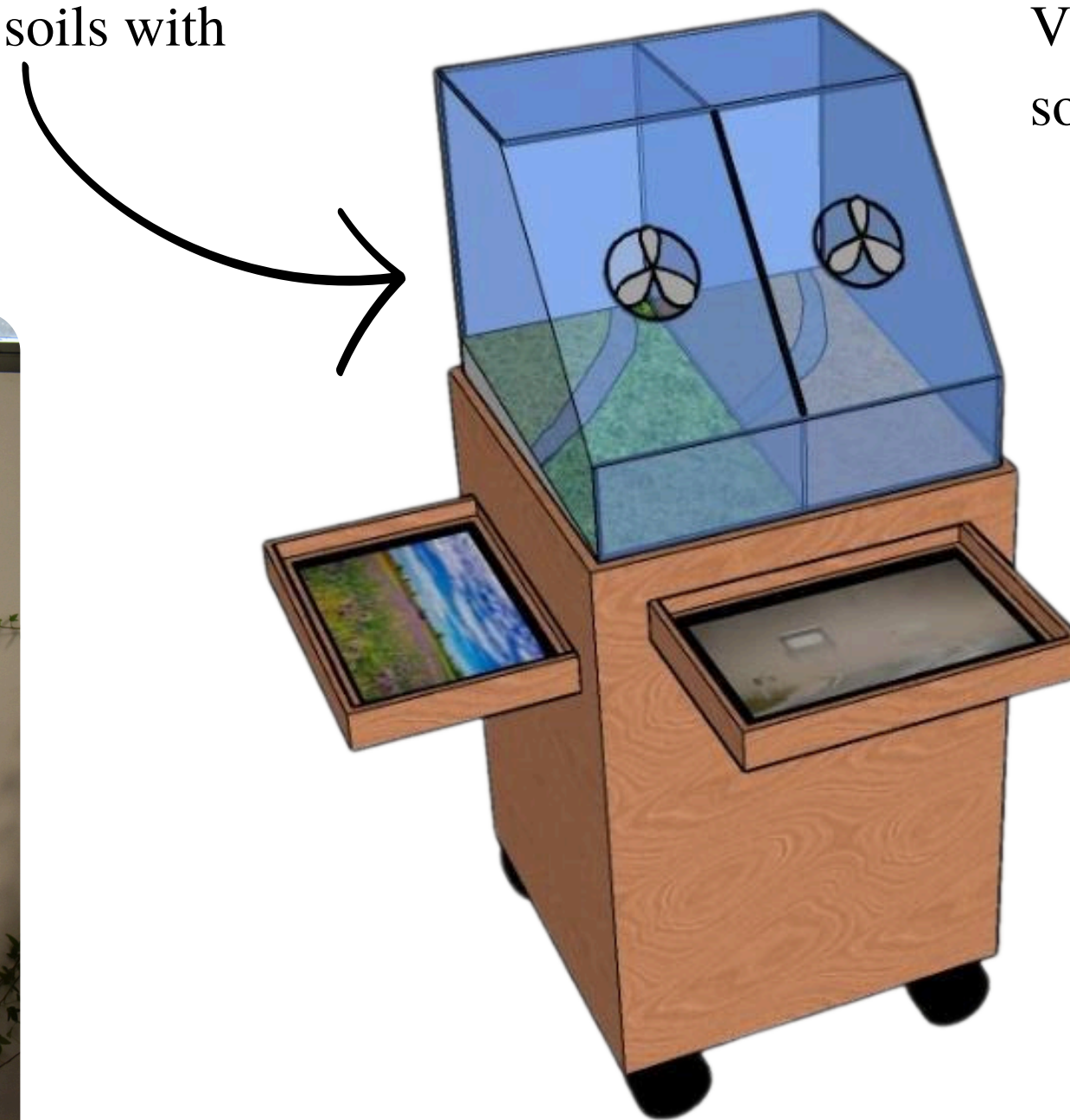


5. Wind effect tool

Nature-based Solution → Cover crops, hedgerows, and agroforestry elements.

What it shows?

A mini wind tunnel comparing bare soils with vegetated soils.



Why it matters?

Vegetation and cover crops help protect soils from wind erosion and nutrient loss.

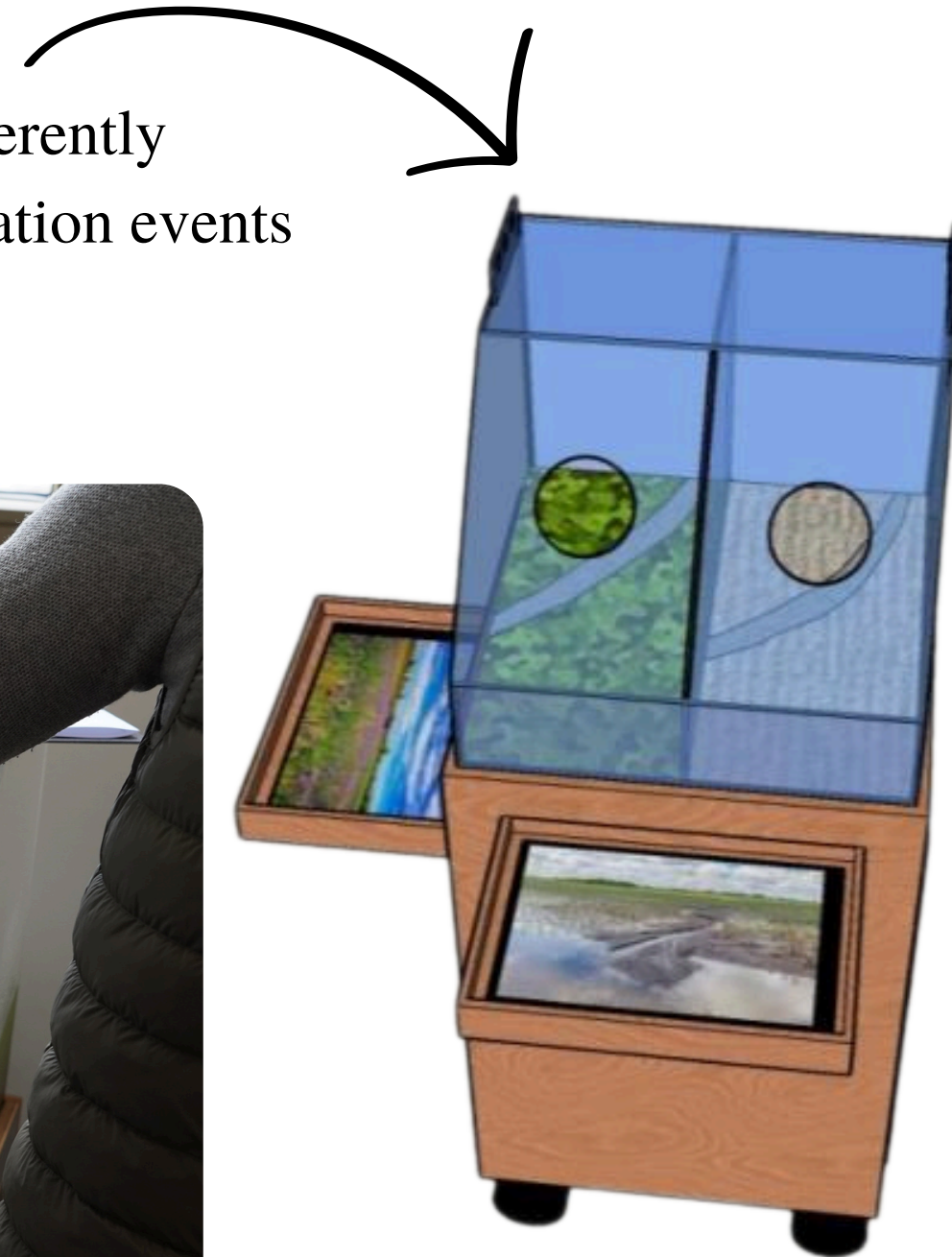


6. Soil erosion rainfall simulator

Nature-based Solution → Ground cover, cover crops, and soil protection practices.

What it shows?

A rainfall simulation comparing differently managed soils during heavy precipitation events



Why it matters?

Vegetation and healthy soils help reduce erosion, flooding risks, and nutrient losses.

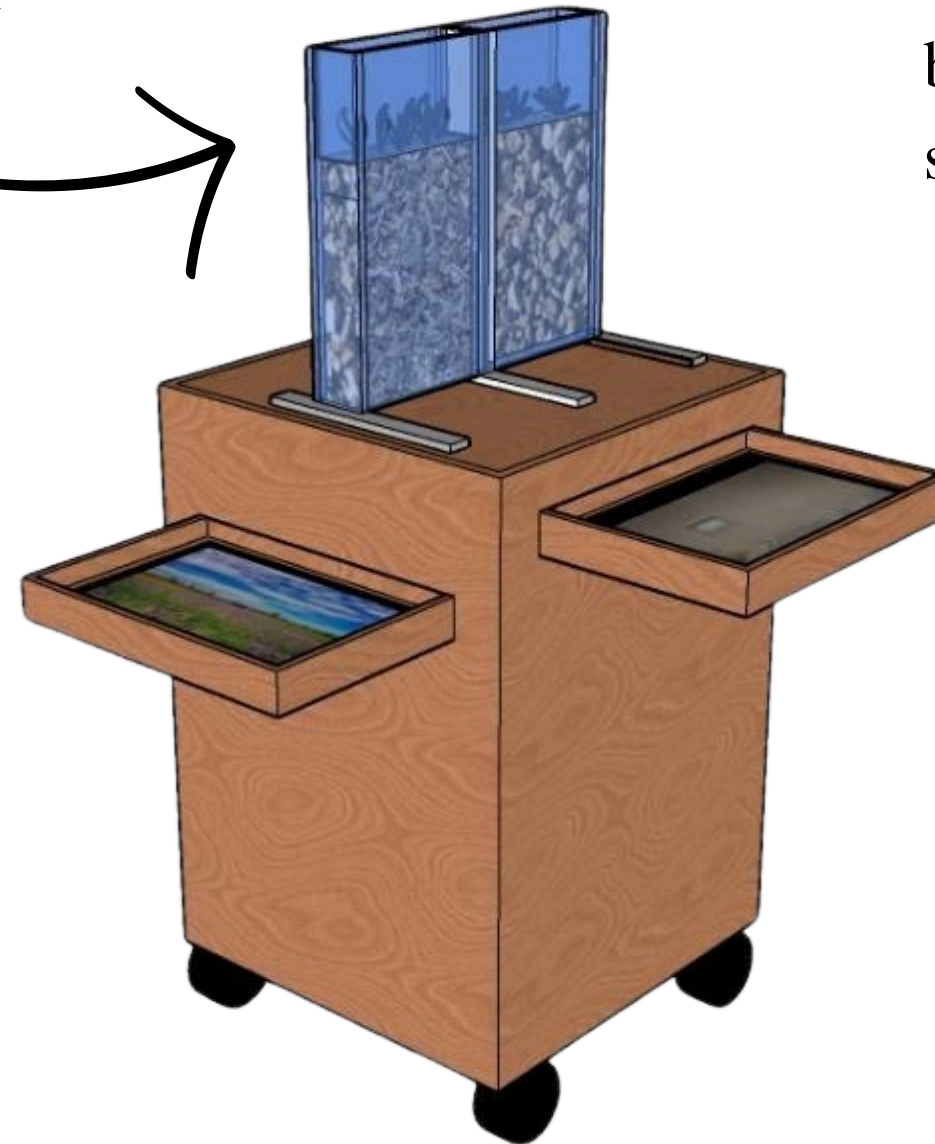
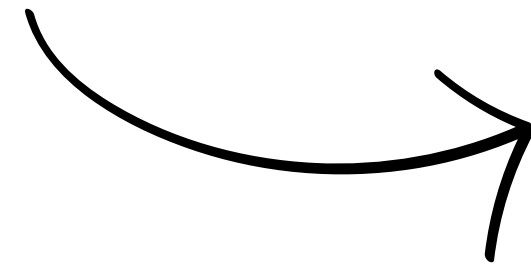


7. Cover crops and Crop rotation display

Nature-based Solution → Diversified crop rotations and cover cropping.

What it shows?

A visual model explaining different cover crops and their role within crop rotations.



Why it matters?

Continuous soil cover improves biodiversity, nutrient cycling, and soil stability.

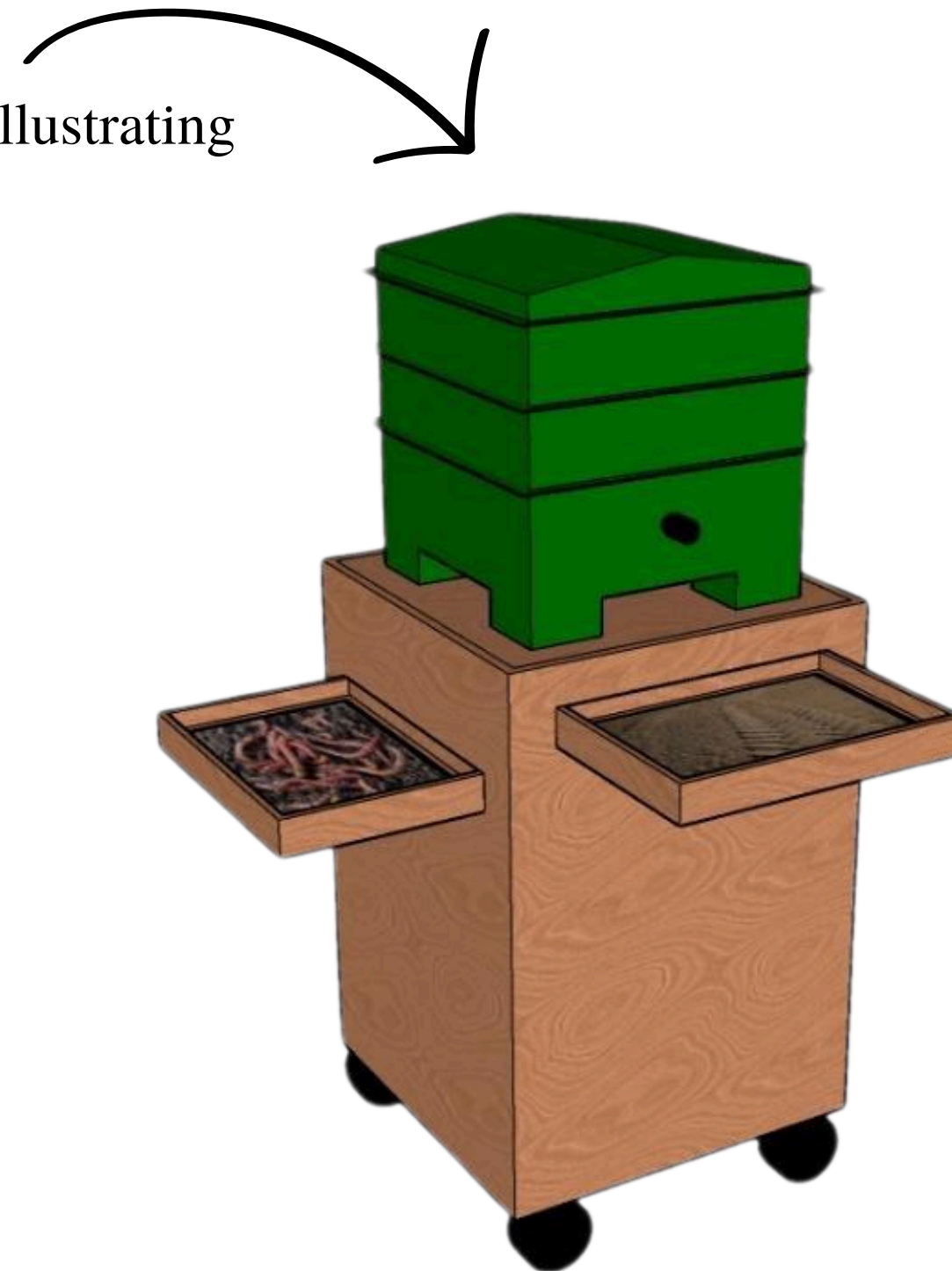


8. Composting process tool

Nature-based Solution → Organic recycling and circular nutrient management.

What it shows?

A worm-composting demonstration illustrating decomposition and nutrient cycling.



Why it matters?

Composting supports circular agriculture by transforming waste into valuable soil resources.



9. Soil formation and microorganisms tool

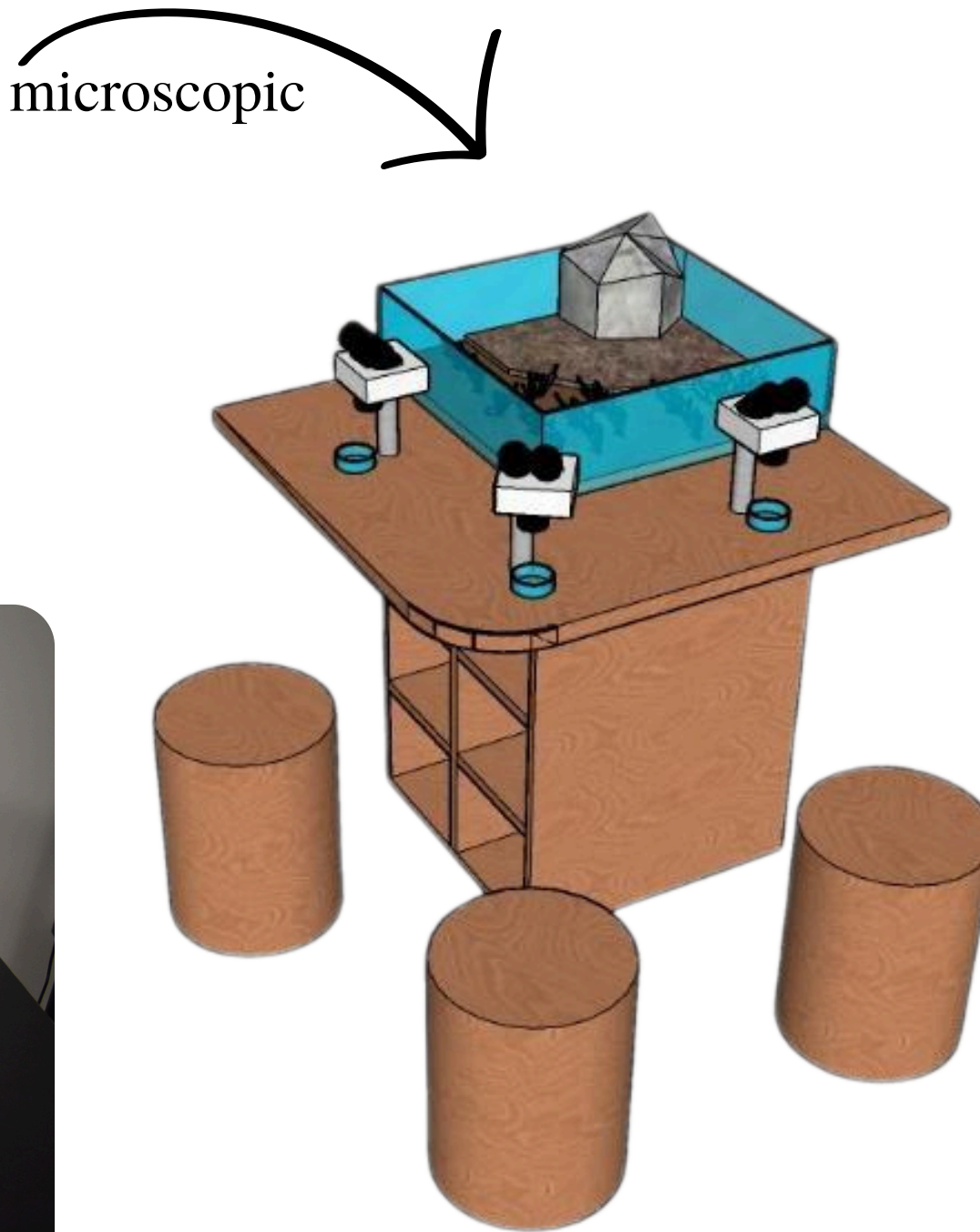
Nature-based Solution → Long-term soil stewardship and biodiversity-friendly farming.

What it shows?

A model explaining soil formation, and microscopic life below ground.

Why it matters?

Healthy soils depend on invisible biological processes that support fertility and ecosystem resilience.



Conclusion

The trans4num NBS Tools demonstrate how complex agricultural and environmental challenges can be transformed into accessible, engaging and practical learning experiences.

By combining: scientific knowledge, storytelling, hands-on experimentation, and collaborative learning, the tools help users better understand the connections between farming practices, soil health, biodiversity and climate resilience.

The tools not only explain environmental problems, they encourage curiosity, critical thinking and solution-oriented approaches for the future of agriculture.

As the tools continue their journey at the Szigetköz Experience Centre and Fairy Island Ecopark, they will remain a living educational resource supporting future workshops, school programmes, farmer engagement activities and public awareness initiatives.





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NBS tools

Contract the Hungarian team:

<https://trans4num.eu/en/about-the-project/partners/>

Read more about the project: <https://trans4num.eu/en/>

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