

Primary students' conceptions about ecosystems damage and protection

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Environmental education context

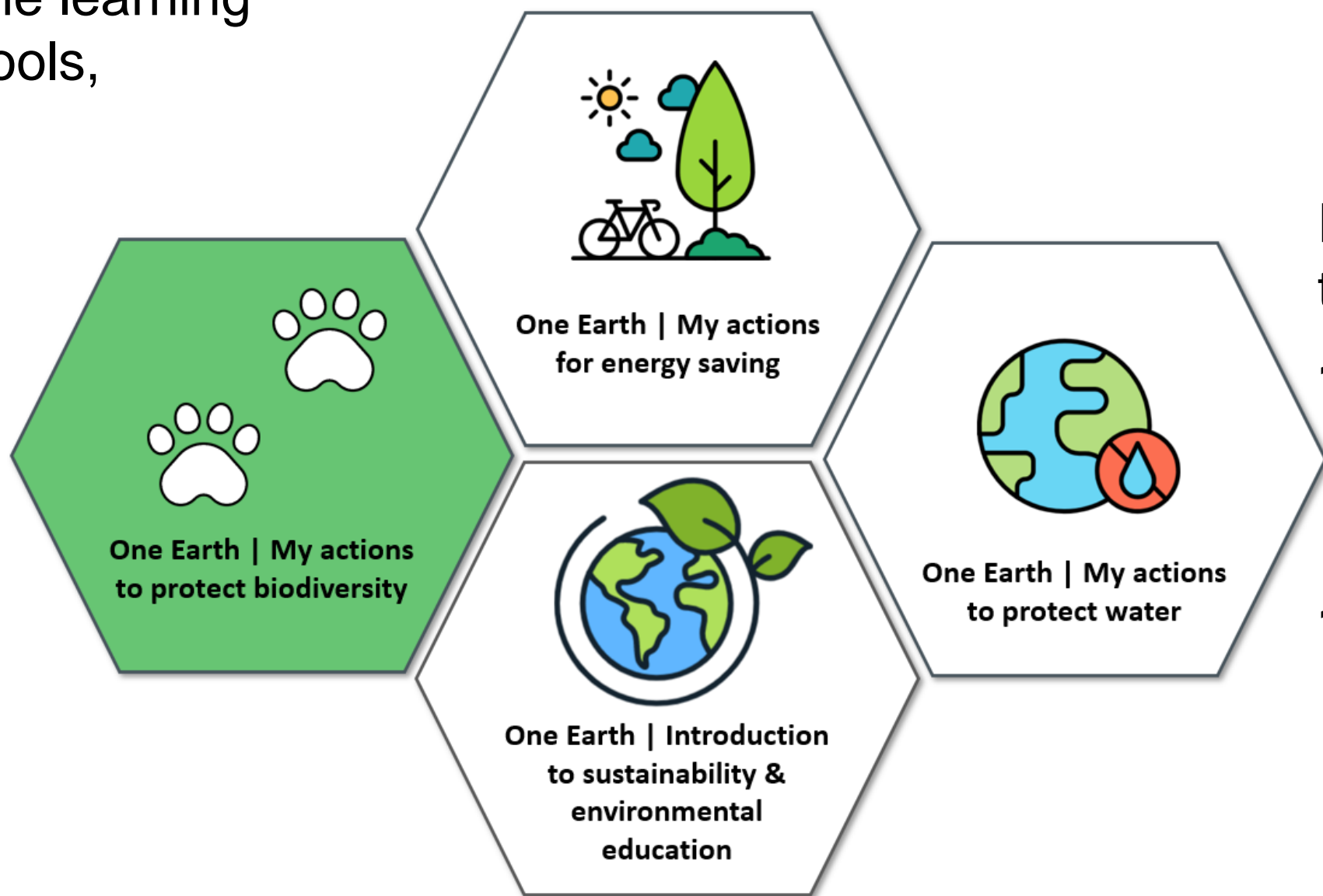
Biodiversity is a key concept in biology. Biodiversity includes all variety of life forms and the diversity of **ecosystems**. In fact, biodiversity and ecosystems are closely related. Therefore, protecting and restore ecosystems contributes to biodiversity protection (UNEP, 2021).

In the TAP-TS project, ecosystems and biodiversity are explored in the learning and teaching package about sustainability education for primary schools, under the activity: **One Earth | My actions to protect biodiversity!**

In this poster we present the results of a task for primary school students focused on biodiversity and ecosystems.

Task. Six primary school students were asked to:

1. Represent an ecosystem with Lego® and describe it.
2. Identify possible damages in the equilibrium of the ecosystem and its causes.
3. Propose actions to protect or restore the ecosystem.



GreenComp context

This work considered the *GreenComp* framework and its sustainability competence development approach regarding ecosystems protection, as stated by Bianchi et al. (2022):

“A sustainability competence empowers learners to embody sustainability values, and embrace complex systems, in order to take or request action that restores and maintains **ecosystem health** and enhances justice, generating visions for sustainable futures.” (p. 12)

Embodying sustainability values is the *GreenComp* area that inspired this work, with a focus on:

1.2. Supporting fairness

To support equity and justice for current and future generations and learn from previous generations for sustainability (p. 14).

1.3 Promoting nature

To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems (p. 14).

Pedro M., 6 years old



- 1 Place were people have their lunch
- 2 Flowers
- 3 Lake with a waterfall and a fish
- 4 Animals and water dispenser
- 5 Mountain with a bird
- 6 Food for cows
- 7 People taking care of animals

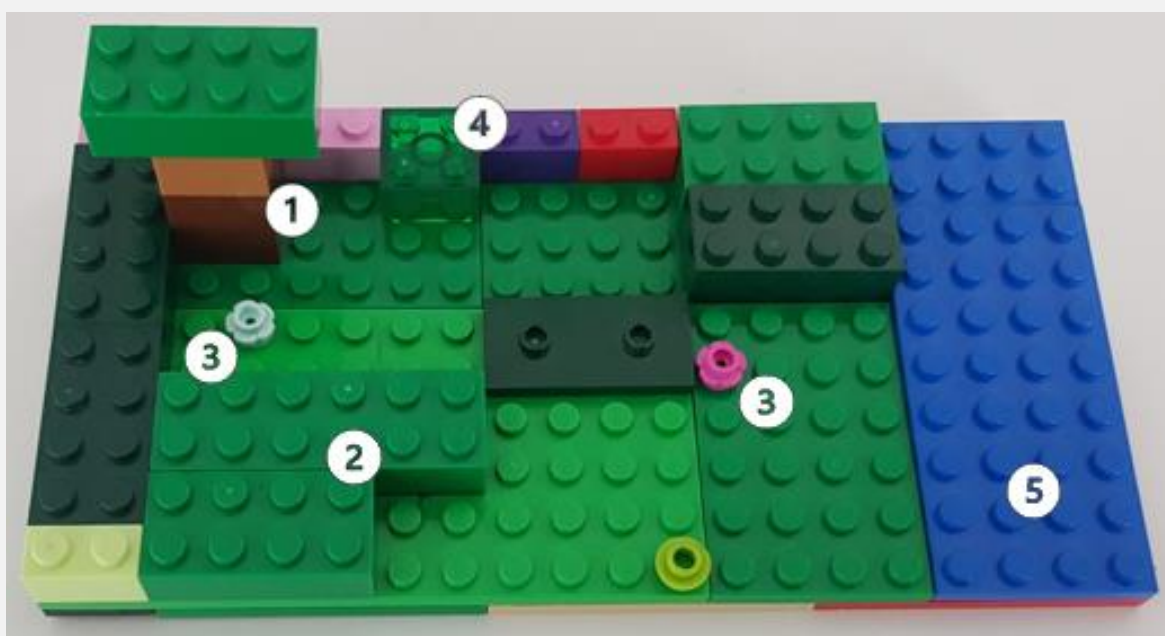
Ecosystem damage

“Due to pollution the animals die, and the birds leave the mountains because there is no food. People die because animals do not provide food. The flowers and other plants can also die, and the landscape will be abandoned.”

Actions to protect or restore ecosystem

“The wind carries the garbage into the sea and the fishes eat it. The fishes think it's food and eat the garbage.”

Pedro C., 6 years old



- 1 Tree
- 2 Grass
- 3 Flowers
- 4 Fence
- 5 River

Ecosystem damage

“Humans can cut down the trees. Humans can pollute the river.”

Actions to protect or restore ecosystem

“Put a sign:

DO NOT HARM NATURE!

Mara, 8 years old



- 1 Park with a river
- 2 Shrubs
- 3 Fallen trunk
- 4 People walking
- 5 Flowers
- 6 Small herbs
- 7 Tree with a flower
- 8 Animals (rabbits)

Ecosystem damage

“Pollution can damage nature. It can destroy everything. It can go into the river and kill the fish ... so we have fewer fish, and the water gets damaged for the other animals to drink. Paper can burn because of the hot sun and can burn everything. Deforestation, as happened in this tree they cut down ... If they cut down too much, they damage the environment. Trees and animals become extinct.”

Actions to protect or restore ecosystem

“Do recycling. Separate the garbage and pick the garbage from the ground. This is very good because it does not go to the forests. We, humans, can do recycling and not throw the garbage to the ground ... and reuse more stuff. Once at my school there was the “R” program: Reuse, Recycle and... Reduce. It was a very important thing for me!”

Guilherme, 8 years old



Tropical forest with:

- 1 Habitats for animals
- 2 Plants
- 3 River
- 4 Flowers

Ecosystem damage

“A tree can fall and hurt an animal. There may be more problems with the plants and with water. Human beings... They cut down the trees and kill the animals. In the water there is CO₂. It gets very hot. Water pollution with plastic causes that animals cannot live there anymore.”

Actions to protect or restore ecosystem

“We must reduce plastic. Respect the rules: do not cut trees, do not kill animals, only the necessary (to eat), and do not pollute water. Do not send things out into the street, we must put them in the trash ... We must put trash in the ecopoints. Do not destroy food for animals and do not beat animals (do not harm them).”

Martim, 9 years old



- 1 Treehouse with a bird on the roof
- 2 Two people who live in the treehouse and one of them has a camera
- 3 Giraffe
- 4 Many plants and grass under the tree
- 5 Flamingo

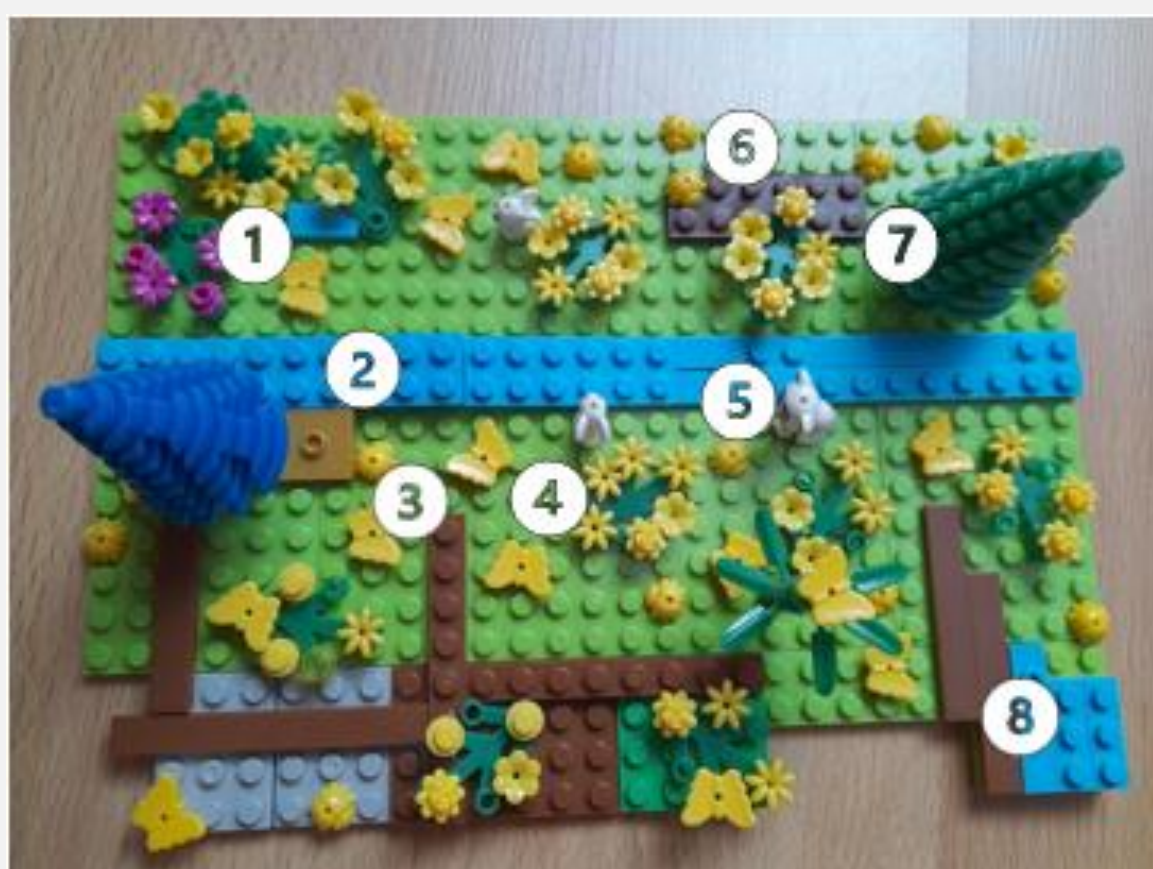
Ecosystem damage

“Pollution and climate change can end this environment. The plants can dry out ... Animals will have no place to eat.”

Actions to protect or restore ecosystem

“In my natural ambient I would have more trees and animals and I would find a way to reuse water.”

Madalena, 10 years old



- 1 Flowers
- 2 River
- 3 Butterflies and ladybugs
- 4 Rabbits
- 5 Lynx
- 6 Grey rocks
- 7 Trees
- 8 Small lake

Ecosystem damage

“Fires, floods, disappearance of plants and animals, the river drying up ...”

Actions to protect or restore ecosystem

“Say to teachers and my friends to make posters for people to stop harming the environment. I can talk to the mayor ...”

Conclusion

Creating an ecosystem with Lego® and thinking about possible ecosystem damage and actions to protect or restore the ecosystem is a valuable pedagogical activity that could contribute to primary school students embody sustainability values, such as supporting fairness and promoting nature.

References

Bianchi, G., Pisiotis, U., Cabrera, M. (2022). *GreenComp – The European sustainability competence framework*. M. Bacigalupo & Y. Punie (Eds.). EUR 30955 EN. Publications Office of the European Union.
United Nations Environment Programme (UNEP) (2021, 30 April). *A beginner's guide to ecosystem restoration*. <https://www.unep.org/news-and-stories/story/beginners-guide-ecosystem-restoration>