

# THE KERKENES ECO-CENTER PROJECT

## Report on the 2018 Activities and Hands-on Sessions at the Şahmuratlı Visitors and Training Center, Sorgun, Yozgat.

Prepared by

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Figure 1. Hands-on sessions with students. (18kekc1013)

## LOCATION

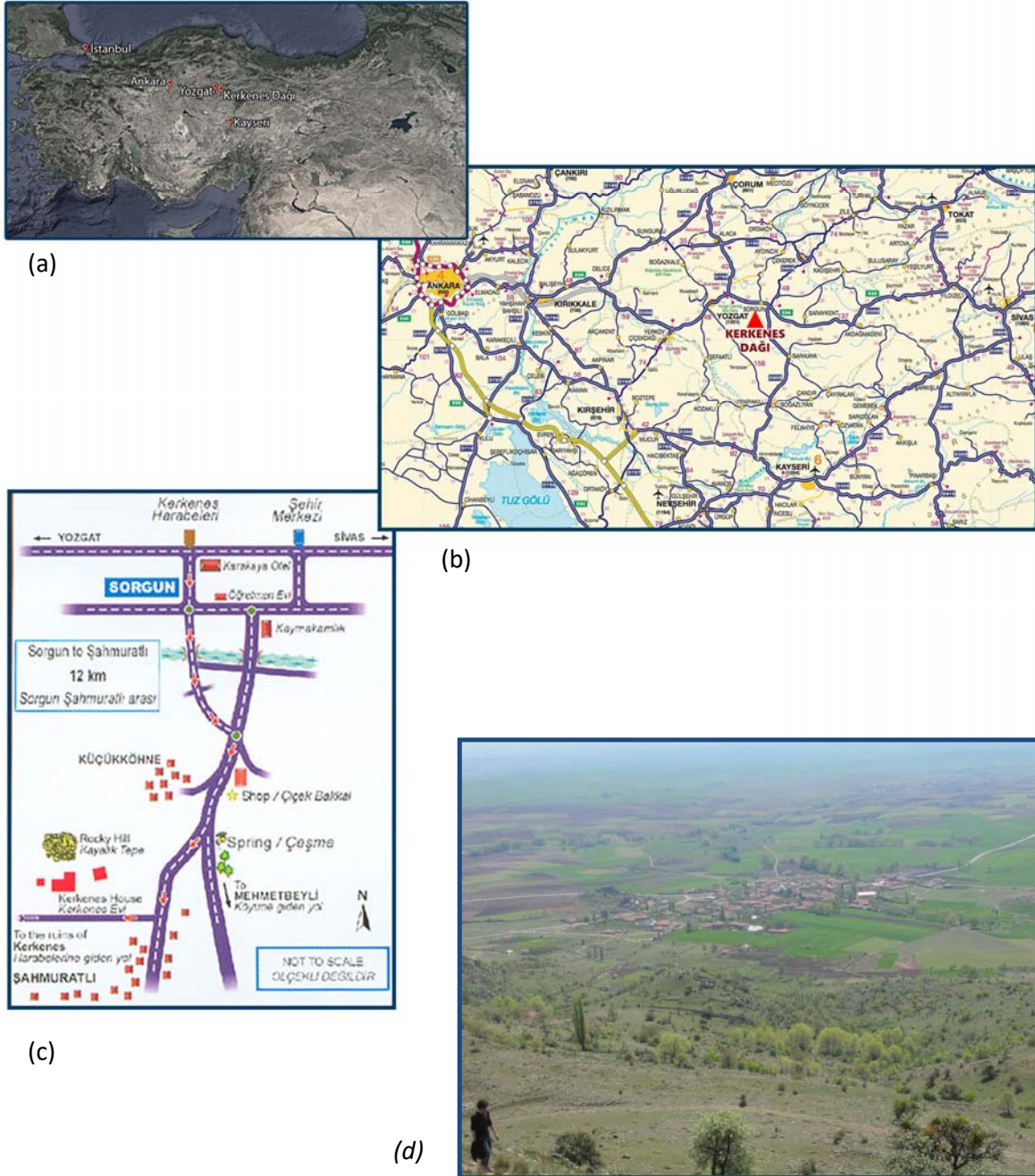


Figure 2. (a) Map of Turkey showing the location of Kerkenes on the northern edge of the Cappadocian Plain. (b) Road map of Central Anatolia showing location of Kerkenes Dağ, the nearby town of Sorgun and provincial capital of Yozgat. (c) Directions to the village of Şahmuratlı. (d) The Village of Şahmuratlı overlooked by the ancient city. (18kekc0604)

## CONTACTS



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<http://kerkenes.metu.edu.tr>

The Kerkenes web page opens up three homepages, K-Eco, the most recent one, is dedicated to the Kerkenes Eco-Center and Environmental Studies.



<http://www.kerkenes.metu.edu.tr/keco/index.html>

The Kerkenes Eco-Center web page reports on activities and annual programs.

### Facebook

<https://www.facebook.com/KerkenesEcoCenter>



**The Kerkenes Eco-Center Project**  
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## ACKNOWLEDGEMENTS

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We also thank all those who have taken part in the development of the Kerkenes Eco-Center since 2002 as well as our generous sponsors, especially AKG Gazbeton, the Erdogan Akdağ Foundation for Education and Culture, MESA, Votorantim Yozgat Çimento and Yenigün İnşaat, without whom much less would have been achieved. We also extend our thanks to the Governors of Yozgat, the Governors of Sorgun district, the Sorgun Mayors and their staff who over the years have never failed to support the project. Finally we thank the village of Şahmuratlı for its continuing hospitality (Figs 2 and 3).



*Figure 3. Refurbished village school, now used as the Şahmuratlı Visitors and Training Center, hosted the 2018 hands-on training activities with university students from METU and AGU. (18kekc0246)*

## INTRODUCTION

Since 2002, the Kerkenes Eco-Center hosts research and activities focused on sustainable practices to reduce energy consumption and improve village life for a sustainable future (Fig. 4). The aim is to promote the use of renewable energy, appropriate building materials with low embodied energies and minimal CO<sub>2</sub> emission. The Kerkenes Eco-center has been a center of innovation and research giving opportunities to local villagers, school children, architecture students and instructors from the Middle East Technical University (METU) to work together. Most of the research and experimental buildings are the fruit of close collaboration between team members and stakeholders as well as the support of several partners interested in archaeology, ecological architecture, environmental design research or the development of rural areas.

### Mission

The purpose of the Kerkenes Eco-Center is to promote sustainability through environmental studies. It pursues the following objectives:

- To advocate the use of renewable sources of energy;
- To act as a stimulus and a catalyst for environment-friendly building with appropriate materials and energy efficient designs;
- To act as a dynamic experimental base for testing designs, materials and activities suitable for viable and sustainable village life.
- To support the income creating activities for rural development, in order to stop and reverse the migration from rural to urban areas.



*Figure 4 A piece of dry wood placed on a solar cooker will soon smoke and burn. (18kek0249)*

## THE 2018 ACTIVITIES

In 2018, hands-on activities at the Kerkenes Eco-Center took place in April when a group of METU students registered for a Hands-on Building course by Prof. Dr. Soofia Elias Özkan, Dr. Berrin Çakmaklı and retired Instructor Françoise Summers. The METU students participating in Hands-on sessions for the *Architecture in situ* course, Arch 326 were hosted for a 3 day program that included visits to the nearby archaeological site, the Iron Age ancient city on the Kerkenes Dag. Project assistants Said Kibarov, Ilya Hayrutdinov and İrfan Gökçe Özer helped with organizing the hands-on activities as well as the repair and maintenance of the amenities. Facilities include the village school now rehabilitated and called the Şahmuratlı Visitors and Training Center. Women from the village prepared the meals (Figs 5 and 6).

Before their trip to Kerkenes, METU students enrolled in the Arch 326 course were given an introduction on the Eco-Center's past activities, its status, mission and also the ongoing archaeological research in the ancient city on the Kerkenes Dağı which they visited (Figs 7 and 8). At the Kerkenes Eco-Center they visited the experimental buildings including the Strawbale Greenhouse, The Kerkenes Strawbale House and The Solar House (Fig. 9). The importance of using appropriate building material and design to improve the environmental performance of buildings was highlighted. As part of the Hands-on program, the students spent time working with local building materials and experimenting with design alternatives.



*Figure 5. The cooks from Şahmuratlı village prepared the meals. (18kekc0223)*



*Figure 6. Students gather around the tables for meals and tea breaks. (18kekc0236)*



*Figure 7. The ancient Iron Age mountain-top city on the Kerkenes Dağ as seen from the Erdogan Akdağ Center for Research and Education. (18kekc0257)*



*Figure 8. Students at the Cappadocia Gate of the ancient Iron Age mountain-top city. (18kekc0257)*



*Figure 9. After students visited the Kerkenes Solar Building and other experimental buildings they helped with some maintenance work. (18kekc0257)*

## Hands-on Activities

During the hands-on sessions, held at the Şahmuratlı Visitors and Training Center, educational activities focused on energy efficiency and environmental design. Students learned how to make traditional mudbricks with a wooden frame (Figs 10 and 11). The brick press was also used to experiment with different ratios of mud and straw to demonstrate their different properties (Figs 12, 13 and 14).



*Figure 10. Villagers and the project assistant preparing mud mixtures for the students. (18kekc1003)*



*Figure 11. Traditional mud brick production. (18kekc0210)*





*Figure 12. METU students making pressed bricks with the villagers during the Hands-on session at Kerkenes in April 2018. (18kekc0212)*



*Figure 13. Filling the press with the mud mixture. (18kekc0210)*



*Figure 14. Removing the bricks from the press and placing them to dry. (18kekc0212)*

Villagers taught the students how to prepare and apply mud plaster in the traditional way. Matthieu Pedernana, a doctoral student and adviser to the project, gave advice on how to mix mud with different substances such as egg and oil so as to improve their durability and resistance to rain and snow (Fig.15). The mud plaster prepared following his recommendations was used to plaster the Nubian vault (Fig. 16). Time will tell us if this new plastering will be more weatherproof.



*Figure 15. Mixing oil with mud plaster to increase its durability. (18kekc0241)*



*Figure 16. METU students plastering the AAC Nubian vault with the mud and oil mixture. (18kekc0253)*

## Repair and Maintenance of Solar Cookers

During the hands-on sessions students have helped with some repair and maintenance tasks at the Kerkenes Eco-Center. Features built by previous groups in the garden needed repair and maintenance (Fig. 17). New silvery adhesive foil was used to reline the parabolic disc of the solar cookers as the original foil had lost its reflectiveness (Fig. 18).



*Figure 17. The mud plaster sun motif of the Kerkenes Solar House stairs was redone by some students. (18kekc0254)*



*Figure 18. Students covering the solar cooker collector with the new reflective silver foil. (18kekc0229)*

## Design and Build Projects

Assignments were given to students and in small groups they selected a relevant topic to study. Each group then used the given time to design and build a chosen item that would be a useful addition to the Eco-Center. One group chose to design a small oven in the garden (Figs 19 and 20). Another group built a bench by the kitchen door thus providing a place to sit in a sunny area when spring temperatures are still low (Figs 21 and 22). A third group built a planting box where herbs could be grown within the end room of the solar space (Fig. 23)



Figure 19. Dr Berrin Çakmaklı giving good advice to the students. (18kekc0248)



Figure 20. The new “tandır” in the garden ready for the jury. (18kekc0264)



*Figure 21. A bench made from mud, AAC blocks and recycled glass bottles. (18kekc0216)*



*Figure 22. The group awaiting the jury by their finished design project. (18kekc0709)*



*Figure 23. The flower box designed and built by a group of students. (18kekc0262)*

### Visit from AGU Students in October 2018

On their way from Kayseri to the Kerkenes Eco-Center, the group from Abdullah Gül University stopped at the Votorantim Cement Factory in Yozgat. A presentation on the manufacturing process was given before lunch and the visit of the factory and laboratories were scheduled for after (Figs 24 and 25). It was a pleasure to meet our sponsors before heading to the Kerkenes Eco-Center for the rest of the day's activities (Fig. 26).



*Figure 24. Lecture on the manufacturing process of cement. (18kekc1119)*



*Figure 25. Visiting the laboratory. (18kekc1009)*



*Figure 26. Hosts and visitors at the entrance of the Votorantim Cimentos offices. (18kekc1120)*

Once arrived at the Şahmuratlı Visitors and Training Center, the students were briefed on the afternoon's hands-on activities (Fig. 27). A demonstration on traditional mud brick production was given by two villagers (Fig. 28). Students were given the opportunity to make some bricks using the wooden frame to produce four bricks at a time (Fig. 29). Finally two small ovens were built using mudbricks that had been made previously (Fig. 30).



*Figure 27. Françoise Summers greeting AGÜ students and explaining the afternoon's hands-on activities. (18kekc1123)*



*Figure 28. The group of students watching the brick-making demonstration. (18kekc1010)*



*Figure 29. Making mudbricks with a wooden frame. (18kekc1133)*



*Figure 30. Making a small oven with mudbricks. (18kekc1138)*



## FUTURE PERSPECTIVES

It is hoped that the Kerkenes Eco-Center will continue to host groups of students for Hands-on session in 2019. Activities to increase environmental awareness could be also organized for groups of school children from the neighboring town and villages.

Over the past decade the facilities have been built up and improved with support from local authorities as well as corporate sponsorship (Figs 31 and 32). To continue running such a project collaboration between the village and educational institution is as essential as financial support or help in kind from sponsors and local authorities. The Kerkenes Team would like here to thank all those involved and hope that a new request for continuing support will be met favorably.

The existence of the Kerkenes Eco-Center in Şahmuratlı and the annual archeological expedition with an international team contributes to the development of the village and hopefully will help reverse the migration from the village to the city and bring the cities to the villages...



*Figure 31. The refurbished school in the village of Şahmuratlı offers ideal space for hands-on and educational activities.*



*Figure 32. METU students with the Muhtar Turan Baştürk. (18kekc0619)*