

Statistical Analysis of Civic Engagement (CCE) events at AUCA for Center for Civic Engagement © 2023 by Nuraiym Ishenbekova, Fotima Sabzalieva is licensed under **CC BY-NC-ND 4.0**



Project for Theory of Probability and Mathematical Statistics(MAT-307)

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**Statistical Analysis of Civic Engagement (CCE) events at AUCA for Center for Civic Engagement
(Track 4.1)**

This project endeavors to comprehensively analyze civic engagement within the AUCA Center for Civic Engagement (AUCA CCE) through statistical methods, focusing on increasing awareness of recycling and sustainable practices. The primary aim is to assess the effectiveness of CCE events and initiatives in promoting sustainable awareness and providing actionable insights for enhancing community involvement in eco-friendly practices. The AUCA Center for Civic Engagement (CCE) is a dedicated unit that promotes civic engagement and social responsibility among students, faculty, staff, and the wider community. One of the critical areas of focus for AUCA CCE is increasing awareness of recycling and sustainable practices. In recent years, AUCA CCE has organized several events and initiatives on this topic, including workshops, presentations, and film screenings.

Problem Statement:

Promoting sustainable practices, including recycling, is crucial to civic engagement in the AUCA community. However, understanding the factors contributing to successful sustainable awareness initiatives is complex. This project will conduct a comprehensive statistical analysis of CCE events at AUCA to assess their effectiveness in promoting sustainable awareness. The specific objectives of the project are to:

1. Identify the key CCE events and initiatives implemented to promote sustainable awareness.

2. Collect data on the participation and engagement of the AUCA community in these events and initiatives.
3. Analyze the data using statistical methods to identify trends and patterns.
4. Conclude the analysis and provide actionable insights for enhancing community involvement in eco-friendly practices.

Objectives:

To analyze historical data related to CCE events, focusing on sustainable awareness, including attendance numbers, participant demographics, event types, and participant feedback.

To assess the impact of sustainable awareness initiatives on event attendees and their subsequent behavior towards recycling and sustainable practices.

To provide recommendations for enhancing the effectiveness of CCE events aimed at sustainable awareness, visual design changes, and awareness campaigns.

The acquaintance with the public partner - AUCA CCE.

Problems:

- People throw trash incorrectly. (Is it necessary to change the number of boxes or arrange them differently so people throw garbage more correctly?)
- Ecological events. More people register, but fewer people come.
- The effect of ecological events on the AUCA community about waste utilization.

Setting the problem.

–The effect of ecological events on the AUCA community concerning waste utilization.

Ecological events are currently taking place. Does the AUCA community's behavior change in response to these events? Are people beginning to practice proper garbage disposal more consistently? Not everyone adheres to the established rules; some individuals may not be aware of them, while others may be reluctant to follow them.

DATA REPRESENTATION

We took data on 6 events that the CCE provided to us. We are focusing on how many people from AUCA attend eco events in order to improve their knowledge of garbage sorting.

№	Title of event	Dates	Number of registered people	Number of registered people (From AUCA Community)	Number of arriving people (From AUCA Community)
1	World Fish Migration Day	17.05.2022	64	6	4
2	Eco TEDx - 1	27.05.2022	43	2	4
3	Eco TEDx - 2	01.10.2022	No information		
4	Международный День Экоактивиста	14.10.2022	No information		
5	Экотур	15.10.2022	32	16	12
6	Конференція по Углеродної Нейтральності	20.10.2023	54	7	4
7	EcoMovieDay	04.11.2023	182	23	21
8	Eco TEDx - 3	11.11.2023	76	0	0

DEVELOPING MATHEMATICAL MODELS

K - number of arriving people

R - number of registered people from AUCA community

A - attendance

B - behavior

P - number of present people

Probability of Attendance given Registration:

- $P(\text{attendance}) = \text{Number of people arriving} / \text{Number of registered people from AUCA community}$
 $P(A) = K/R$

Changed Behavior Impact:

- $I(\text{behavior}) = \text{Number of registered people from AUCA community} \times P(\text{attendance})$
 $I(B) = R * P(A)$

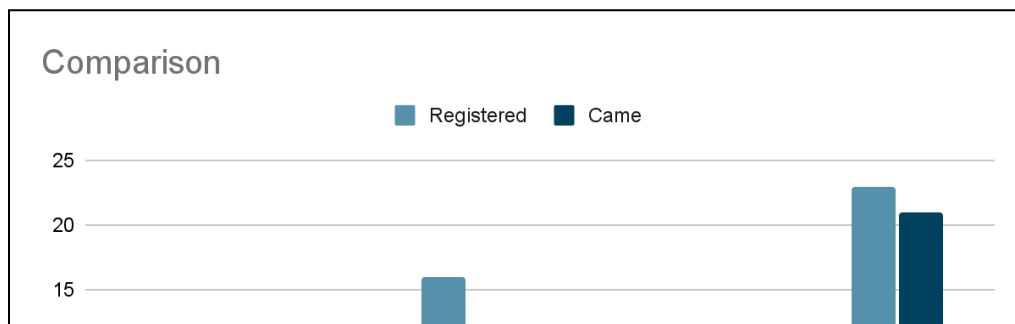
The attendance percentage is calculated by taking the number of people present and dividing it by the total number of registered people, then multiplying by 100 to express the result as a percentage:

- $A = R/P * 100$

DATA ANALYSIS

We compared the number of people registering and actually coming (from AUCA Community) to eco events. It has been observed that the number of people registering is more than the number actually coming.

- **World Fish Migration Day:** Attendance Percentage = $(4/6) \times 100 \approx 66.67\%$
- **Eco TEDx - 1:** Attendance Percentage = $(4/2) \times 100 = 200\%$ (more people came)
- **Экогур:** Attendance Percentage = $(12/16) \times 100 = 75\%$
- **Конференция по Углеродной Нейтральности:** Attendance Percentage = $(4/7) \times 100 \approx 57.14\%$
- **Eco TEDx - 3:** Since there were no attendees, the attendance percentage is 0%.
- **EcoMovieDay:** Attendance Percentage = $(21/23) \times 100 \approx 91.30\%$



Revealed the percentage of those attending eco-events(6 out of 8) from other universities, schools, organizations with AUCA Community.

- Percentage from Other Institutions = (Total number of registered people/Total number of people from other institutions) * 100
- Percentage from AUCA = (Total number of people from AUCA/Total number of registered people) * 100

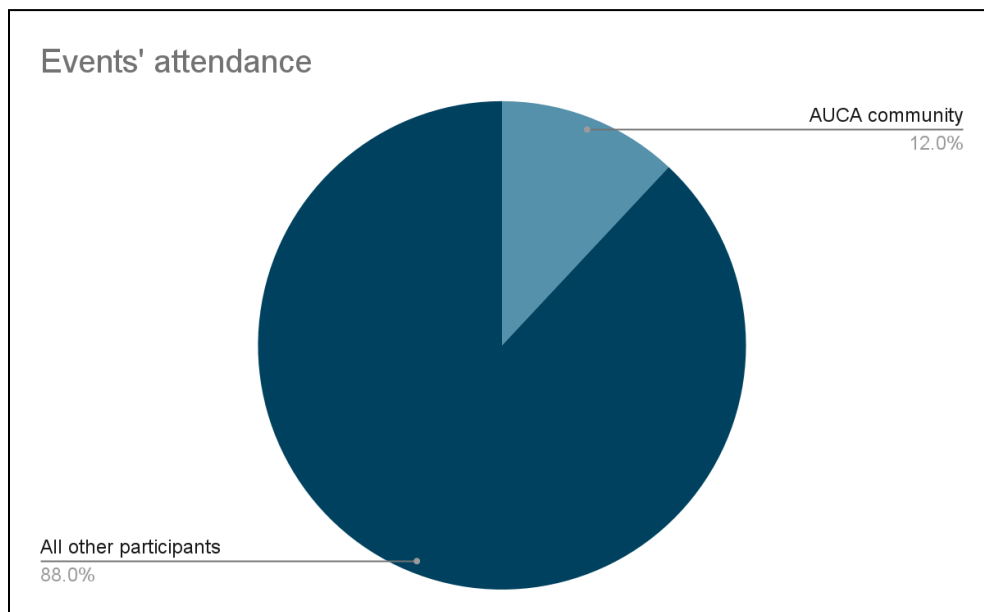
1. Total number of people from Other Institutions: 397

2. Total number of people from AUCA: 54

3. Total number of registered people: 451

- Percentage from Other Institutions = $(397/451) * 100 \approx 88\%$
- Percentage from AUCA = $(54/451) * 100 \approx 12\%$

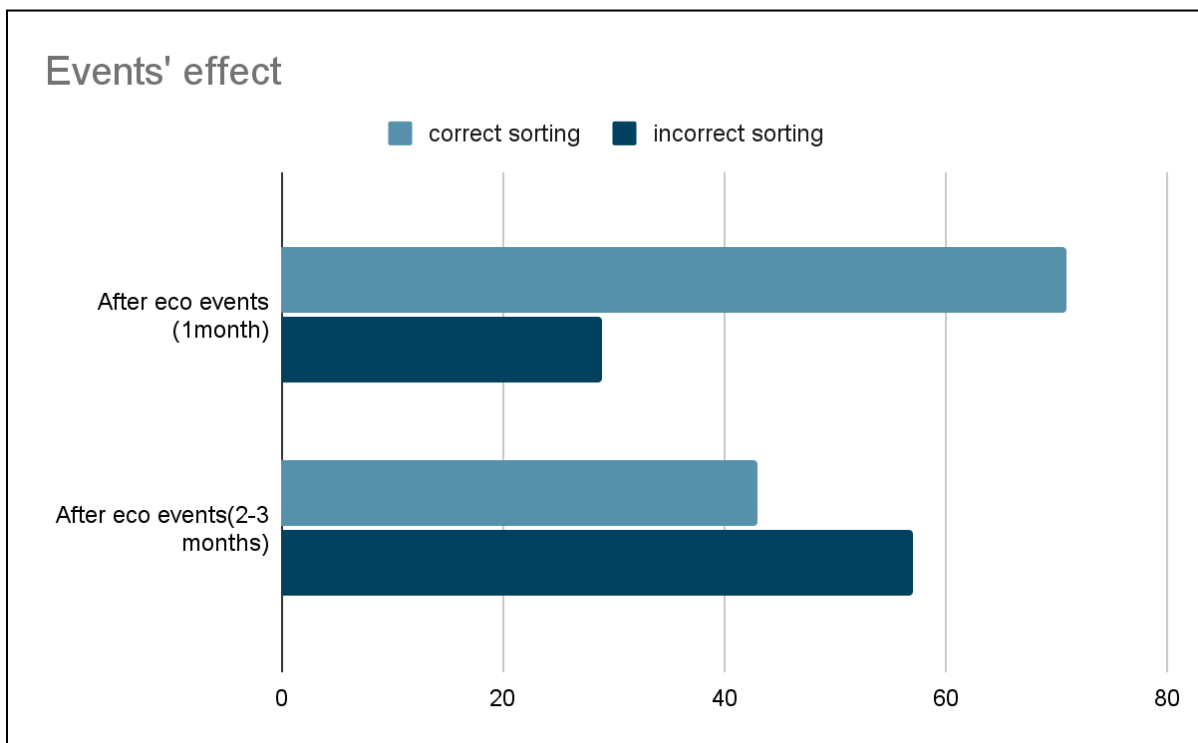
OBJECT



This suggests that there might be room for improvement in engaging the AUCA community in eco-events related to waste utilization.

Eco-events' impact on the AUCA community, influencing attitudes and behaviors related to proper waste sorting.

After the events, the correct sorting of garbage according to subjective observations increases. However, the effect is not long-term, and if eco events are not carried out for a long time, the number of people sorting garbage correctly decreases again.



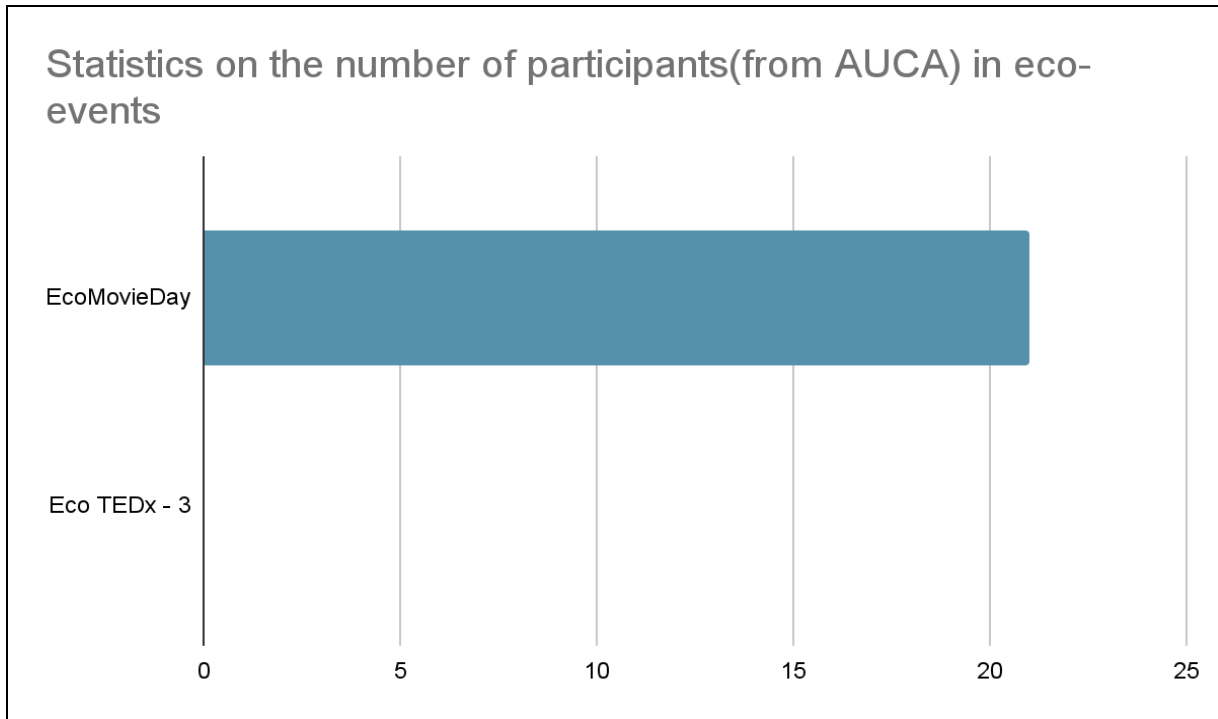
Increasing participation in eco-events can effectively promote correct sorting of garbage and raise awareness about sustainable waste management practices. Therefore, it's important to increase the number of participants and develop a strong strategy.

SOLUTION

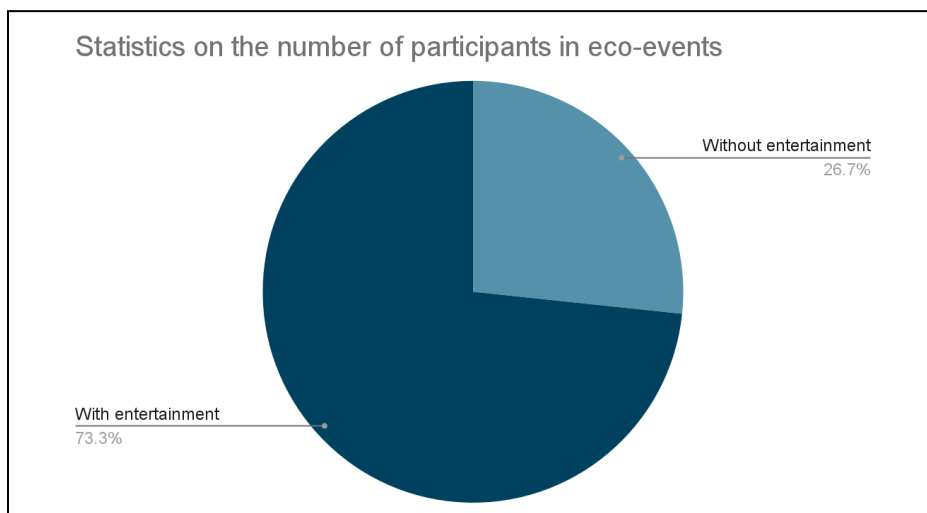
Comparing the theoretical results with practical ones.

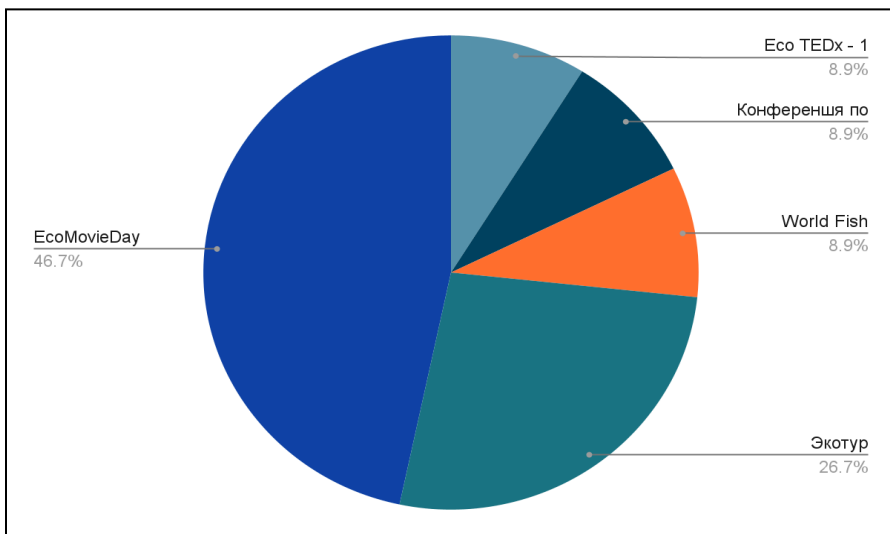
– The most effective solution involves enhancing the engagement and entertainment aspects of eco-events to draw increased participation from the AUCA community and conducting these events more frequently.

Based on the schedule of the last two events, one of them had no entertainment programs, while the other had a lot of interesting, people-pleasing programs.



1. **Participants Without Entertainment Program:** 12 participants
2. **Participants With Entertainment Programs:** 33 participants
 - Increase in Participation = $33 - 12 = 21$
 - Percentage Increase = $(\text{Participants Without Entertainment Program} / \text{Increase in Participation}) * 100$
 - Percentage Increase = $(21/12) * 100 \approx 175\%$

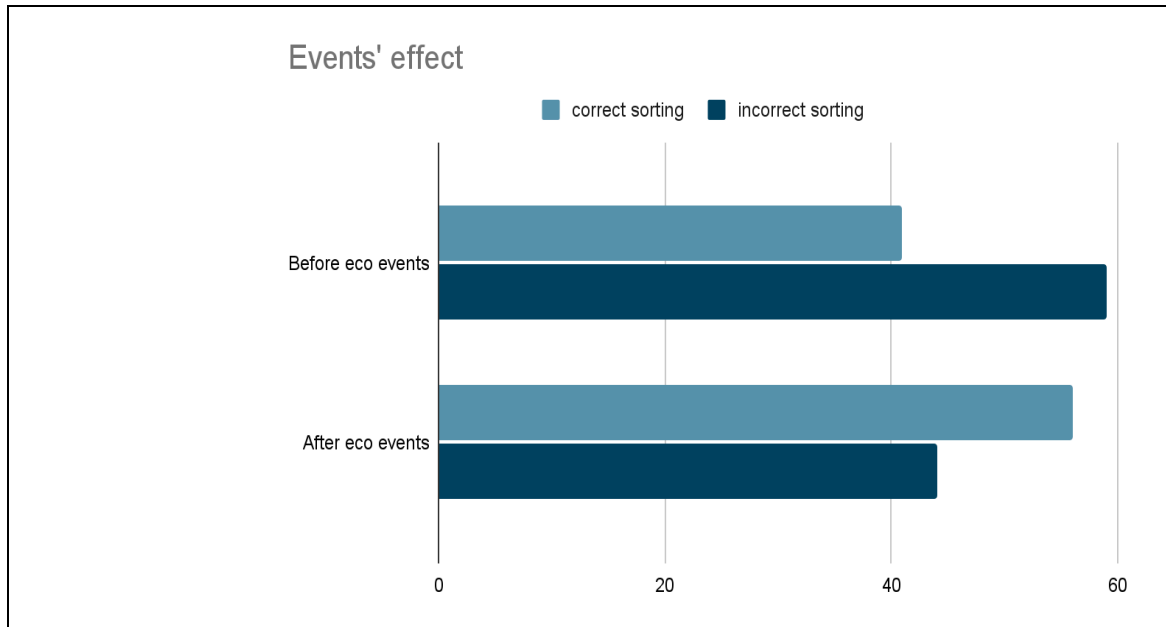




It is observed that the number of participants in eco-events tends to increase proportionally with the inclusion of engaging and entertaining programs. The events that have engaging and entertaining programs: EcoMovieDay, Экотур.

Predictions based on the solution.

By introducing more entertainment programs into eco events, more people will start attending these events. Accordingly, more people will be informed about the correct sorting of garbage, which in turn will lead to a more correct sorting of garbage. The effect of eco-activities is visible immediately, people start sorting garbage more correctly, but the effect is short-lived, so if you conduct eco-activities more often, the effect will be more obvious and lasting.



CONCLUSION

In conclusion, the analysis of eco-events within the AUCA community highlights the need for a strategic and engaging approach to enhance participation and promote sustainable waste management. The data also underscores the importance of infusing entertainment elements into events, with a notable increase in participation observed when engaging programs are incorporated. Addressing the short-lived effects and ensuring lasting change require a combination of frequent eco-events, strategic planning, and entertainment-rich programming. By adopting these measures, the AUCA community can foster a more sustainable and environmentally conscious culture.

RECOMMENDATIONS

Diversify Event Formats:

– Explore various event formats, such as panel discussions, workshops, hands-on activities, and exhibitions, to cater to different learning preferences within the AUCA community.

Create Educational Materials:

– Develop visually appealing and informative materials, such as brochures, posters, and online resources, to reinforce the key messages from eco-events and serve as ongoing references.

Establish Eco-Ambassador Program:

– Recruit and train eco-ambassadors from the AUCA community who can actively promote and encourage sustainable practices among their peers.

Gamify Waste Sorting:

– Introduce gamification elements to waste sorting, such as challenges, competitions, or reward systems, to make the process more engaging and enjoyable.

Host Regular Feedback Sessions:

– Conduct feedback sessions after each eco-event to gather insights, address concerns, and involve the AUCA community in shaping the content and format of future events.

Facilitate Campus Clean-Up Initiatives:

– Organize regular clean-up initiatives on the AUCA campus, combining environmental awareness with practical actions to keep the campus clean and promote a sense of ownership.

Proposed changes to eco-boxes:

1. Change height

– Change the height of the boxes to make it more convenient for people to throw garbage. We learned that the height of the boxes at AUCA does not exceed 70 cm. As we learned, the optimal and most comfortable height of eco-boxes for a person is from 80 to 100 cm. (The idea was not implemented due to the fact that boxes are ordered and to order at least one box you need to request funds, but for the sake of the experiment AUCA will not allocate funds even for one box. The second option was to put the box on something to make it higher, however, there were difficulties with this idea. When cleaning up garbage, the cleaners move the boxes and, due to the rush, do not always place them correctly since they have a certain time for cleaning all floors, so any stand would slow down the cleaning process)

2. Large holes

– Make larger holes in the boxes where garbage is thrown out (this idea was not implemented due to the fact that we were forbidden to damage the eco boxes in any way. They could not be holed, cut, or glued to anything)

3. Completely paint

– Paint all the boxes completely in the color of the lid so that they catch the eye (again, you cannot perform any actions with the box)

4. Ribbons

– Place tapes under the boxes that match the color of the box so that when cleaning up the garbage, the cleaners put the boxes in their places, since they often change the places of the boxes when cleaning up the garbage. And we wanted the boxes to always be placed in the same place, so that people, even intuitively in a hurry, without looking at the box, would know what to throw away and where (unfortunately, we could not be provided with the means or materials to implement this idea)

5. Tables0

– Make signs with pictures and an inscription of what can and cannot be thrown into the box and stick it on top of the box to the wall at eye level, so that people can better understand what can be thrown and what cannot (as it turned out, it was also impossible to glue or draw on the walls other manipulations so as not to spoil anything)

6. Tables1

– We decided to offer an alternative to the previous option and make the tables on a stick and glue them to the boxes on the back of the pack. (we didn't find a suitable material as a stick and didn't find an option on how to glue it so as not to spoil the box)

7. Remove the plastic box

– They suggested removing the plastic box. On some floors of the campus, next to the cardboard boxes with holes in the lids, there is a plastic waste disposal box with an opening lid. After watching garbage thrown out for several days, we came to the conclusion that few people throw garbage into these boxes because they are less convenient compared to boxes with lids, which have a hole where you don't have to make any effort to throw out garbage.

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