



Development of Bio-Toilet suitable for Mongolia's climate



MONGOLIA OPEN
INNOVATION AND
CO-CREATION FOR
SDGs-(MICS)-2024



STAR
スターエンジニアリング株式会社



The Nihon Wellness Sports University supports
the Sustainable Development Goals.

Project Rationale

Previous JICA research has shown that the toilet penetration rate in Mongolia is very low, at 29% in rural areas and 64% in the capital.

This indicates that 60% of the population lives without sanitation facilities, and despite the fact that Mongolia is a vast country, the penetration of modern toilets is limited, despite the fact that toilets are becoming more Western-style.



Project solution

🚫 We aim to develop and promote Mongolian-style bio-toilets using the "Asidro® Compost Decomposition Method (patented)" and create safe, environmentally friendly ecological sanitation facilities for everyone. We believe this is needed not only in Mongolia, but also in other Central Asian countries.

Our bio-toilet works well at -20°C, which is more suitable for the Mongolian environment, and because it works in an acidic environment, there is no ammonia smell.



Project team members



Anudari



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Jaraakhai



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Tomoya
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Gan-Od

Advisor



Project plan



Needs survey
On going



Usage research
On going

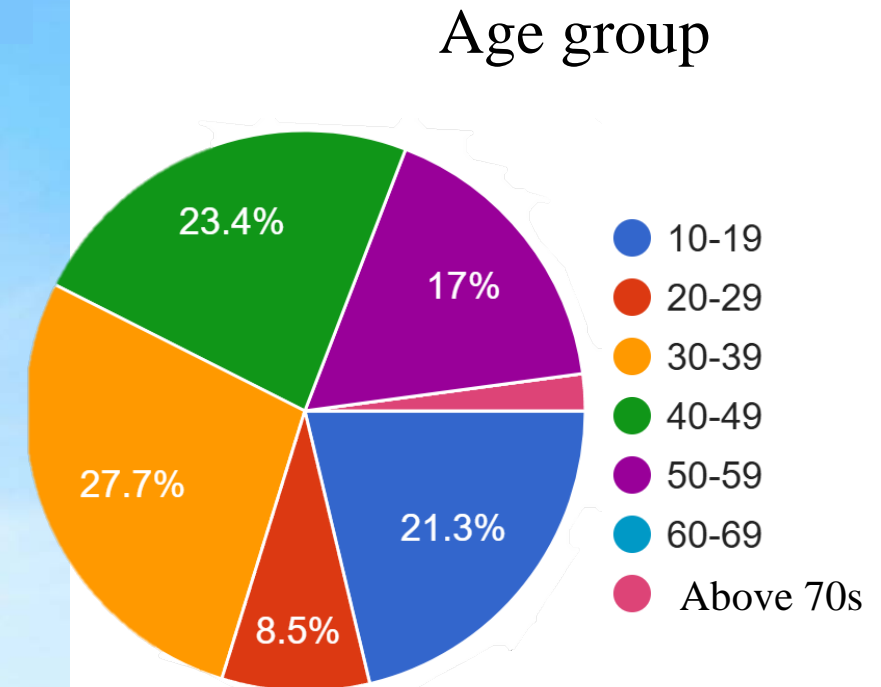
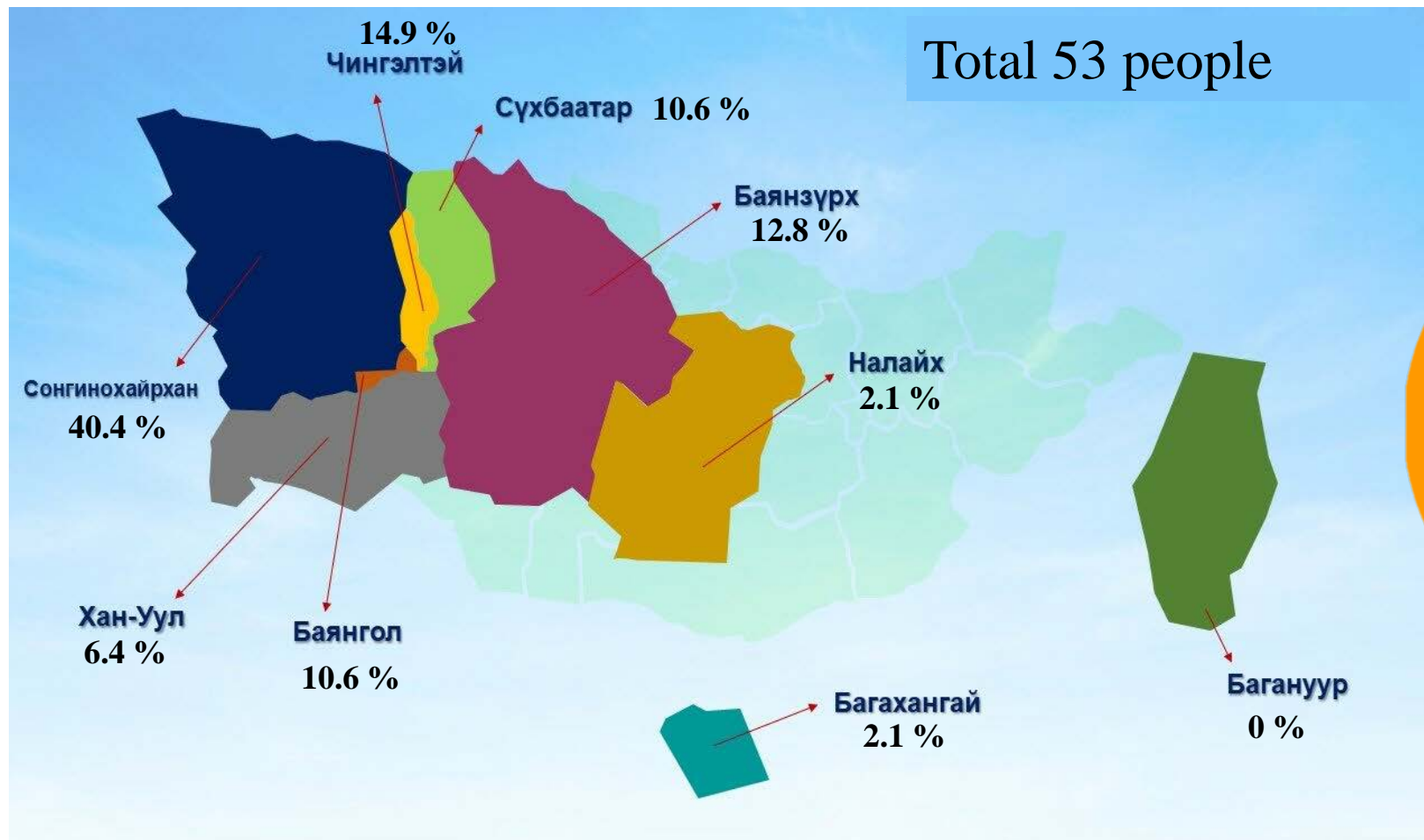


Develop
prototype
On going

Targeted funding\1,500,000 ¥ = \$ 9,665.99\

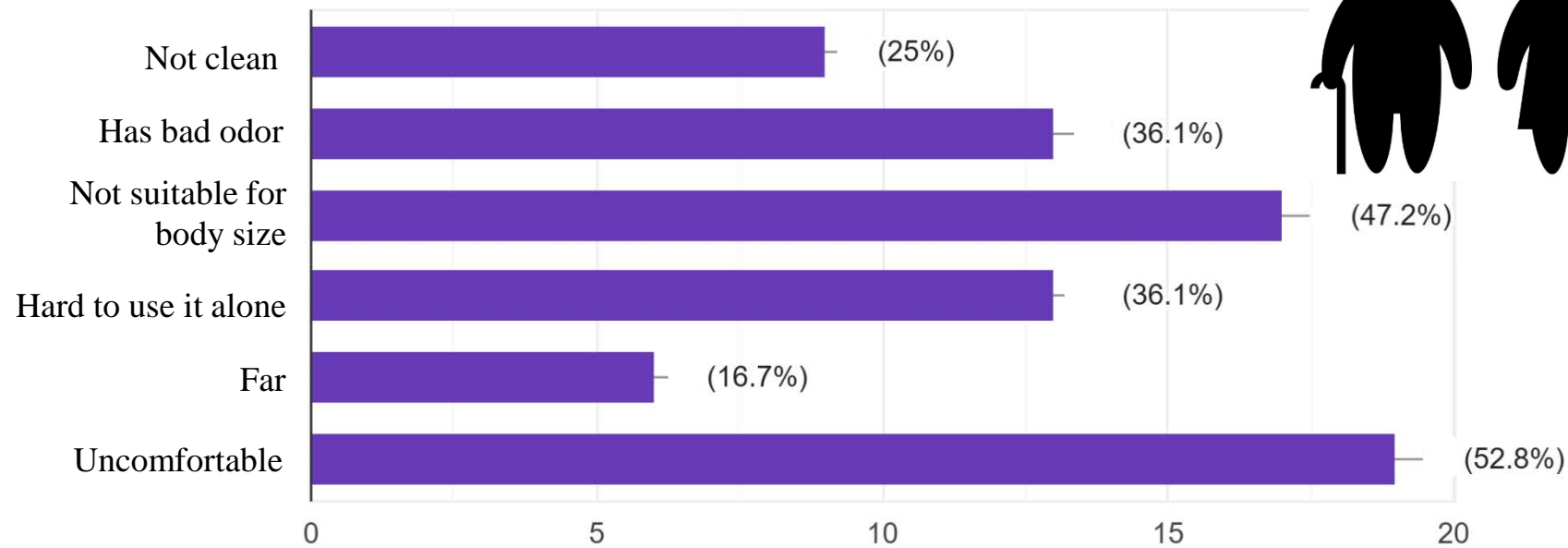


Results of needs survey

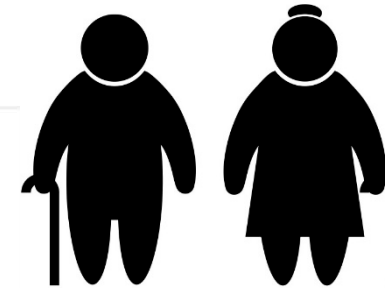


Results of needs survey

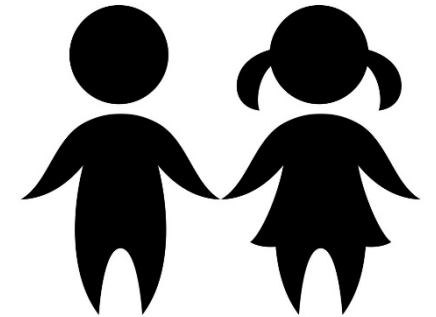
Difficulties for the elderly, kids below 5, and specially-abled people in using the toilet



35.7 %



66.7 %



19 %



Mongolian model bio-resource research

We began our research on bio-toilets on September 1st, involving 4th- and 5th-year students from Mongol Koosen College of Technology. Conducting the study within the college allows us to efficiently collect valuable data on usability, environmental factors (temperature & humidity), and functionality in Mongolia's harsh climate.

Challenges & Solutions:

- Issues: Initial challenges included unpleasant odors and sawdust accumulation due to low humidity.

- Solutions:

- Increased water content in the system to maintain moisture.
- Installed a drain pipe to dissipate odors.

These adjustments have significantly improved functionality and user experience, making the bio-toilet more suitable for Mongolian conditions.



Mongolian model bio-resource research

To determine whether the toilet can function in Mongolia's harsh climate, we tested it outdoors in temperatures as low as -31°C . The toilet successfully processed food waste without any issues. However, further testing in even colder conditions is needed to ensure its reliability in extreme climates.



Prototype development

Based on the results of the survey, we would like to produce a prototype model that can be used by children, the elderly, and people with disabilities. We are also looking for companies that would like to actually use our prototypes.

These include models tailored to the body size of children under the age of 5, as well as easy-to-use prototypes for elderly individuals and people with special needs. Each prototype is estimated to cost approximately **3.3 million MNT.(150,000 ¥)**



Prototype research

To create a model tailored to the body size of children under five, we integrated a child-friendly toilet seat atop the regular one, along with an adjustable footrest for added stability. We tested this enhanced design with children around the age of five, and they were able to use the toilet comfortably without any issues. This demonstrates a certain level of success in achieving our goal.



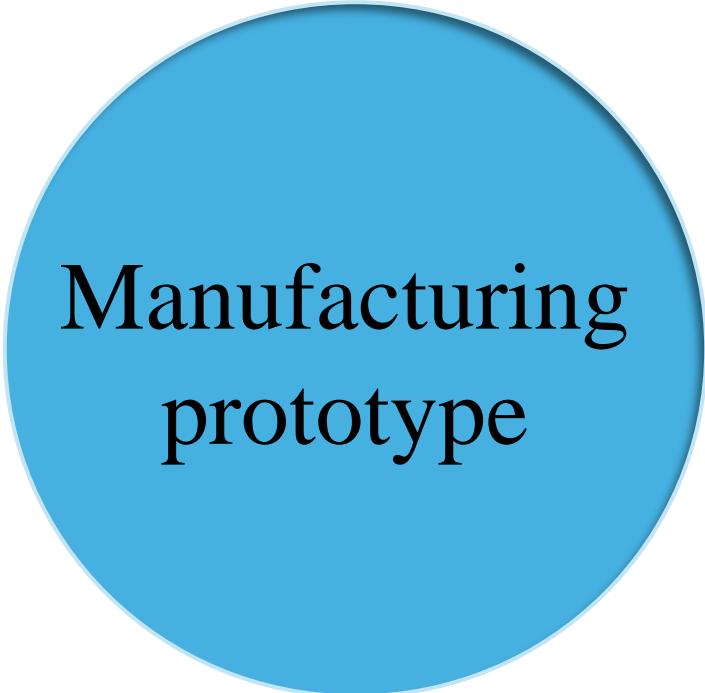
Prototype research

To create an easy-to-use prototype for elderly individuals and people with special needs, we added support handles on each side for enhanced stability. We tested the toilet by placing it in the home of an 85-year-old woman who has difficulty walking, sitting, and standing due to multiple joint surgeries. After using it for five days, she reported that it was very pleasant, easy to use, and had no issues. This suggests that the design can effectively address similar challenges faced by others with comparable conditions.






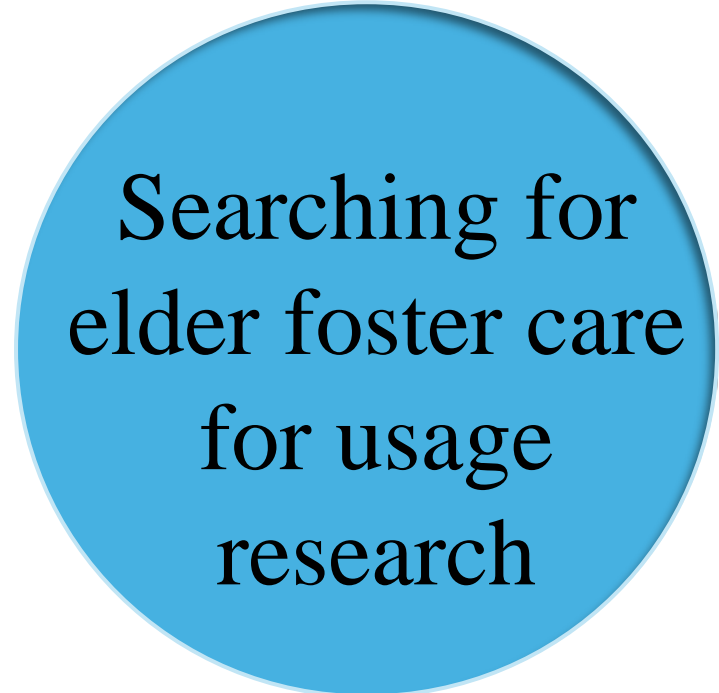
Future plan




Manufacturing
prototype



Usage research
on multiple
subject



Searching for
elder foster care
for usage
research



We hope you will support our project and
help spread the suitable toilets that
Mongolia deserves.



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