



Integrated Water Resources Management – Model Region Mongolia –



MoMo Fact Sheet

iPiT® - integrated Personal innovative Toilet

SPONSORED BY THE



Federal Ministry
of Education
and Research



FONA
Sustainable
Water Management
BMBF

Authors:

Dipl.-Ing. Jürgen Stäudel
Bauhaus-Universität Weimar

B.Sc. René Seyfarth
Bauhaus-Universität Weimar

Prof. Dr. Jörg Londong
Bauhaus-Universität Weimar

Editors:

Prof. Dr. Dietrich Borchardt
Michael Schäffer
Dr. Daniel Karthe
Helmholtz Centre for Environmental Research



Background

2.6 billion people on this planet do not have access to a proper toilet. Each day hundreds of children are dying underage due to fecal-oral-transmitted diseases.

Many experts work on adapted solutions for the world-wide sanitary crisis, but a real breakthrough is not in sight.

The main objectives which still need to be considered are:

- development of standardized technical components
- better availability of adapted technology
- integration into an overall sanitation system
- economical sustainability
- stakeholder involvement

Under the guidance of Prof. Dr. Londong, the Bauhaus-Universität Weimar developed an innovative toilet, called the iPiT®.

The iPiT team tries to contribute to find solutions for the worldwide sanitary crisis by addressing the main objectives in their pilot project in Darkhan within the frame of the MoMo project.

iPiT development

The iPiT is a key component of an integrated sanitation system. Therefore it is specifically designed to match the specific needs of the overall system. The toilet and the containers have to function as a unit. Urine and feces are separately collected in 2 different containers. Replaceable, stackable and easily transportable containers are crucial components of the toilet.

Through separate collection of urine and feces it is possible to apply the most suitable way of treatment (biogas digester and composting) and value added reuse of nutrient-rich fertiliser in agriculture. The production of energy and fertiliser shall contribute to the economic sustainability of the system.



Fig. 1: Transport of new iPiTs.



Fig. 2: Emptying of an iPiT.

Another very important criteria in the development process of the iPiT® is the enhancement of the user comfort. The toilet should as well be safer and easier to use for children and elderly people. Most of the old latrines have wooden boards over the cesspit and in wintertime (with temperatures down to minus 40°C) these are very dangerous to use. Additionally the old latrines are very unhygienic, contaminate the soil and the groundwater and are therefore the main reason for the spread of faecal-oral transmitted diseases.



Fig. 3 (left): An old latrine. There is not exist any user comfort an in wintertime the ground is frozen.



Fig. 4 (right): The new iPiT with an toilet seat. The comfort is much better and the toilet is much safer than the old latrine.

iPiT as a part of the integrated sanitation system

The iPiT is one main component of the integrated sanitation system with following research objectives:

- development of the iPiT as part of the integrated sanitation system, which is suitable for a large scale implementation in Mongolia
- emerge business opportunities for local services which include iPiT production, collection, transport and treatment of the organic matter
- identification of the potential for optimization in terms of acceptance, comfort and maintenance of the toilet technology
- identification of the potential for optimization of the integrated sanitation system in terms of material flows, energy flows and cash flows

Integration of the toilet user

From the beginning of the project the families, which use the toilets and other stakeholders were integrated in the whole planning process. Capacity development for all stakeholders is essential for the acceptance of the new toilet system.

Toilet Use	ЖОРЛОНГ ЗӨВ ХЭРЭГЛЭХ НЬ	Toilettenbenutzung
<p>Please sit down on the seat, it is necessary for a good separation</p> <p>Help the kids to use the toilet seat</p>	<p>Тэг суултуур ашигтахад бие зэрэгтэй Илгээхээр таны өгвөн шигээн сайн ялгарна</p> <p>Балч нарын хүүхдэд үүрээний суултуур хэрэглэх нь тохиромжтой</p>	<p>Um eine gute Trennung zu ermöglichen, setzen Sie sich bitte auf die Kiste</p> <p>Helfen Sie Kindern den kleineren Sitz aufzuliegen</p>
<p>Make sure to throw the toilet paper in the rear part</p> <p>Don't flush waste into it - Call the MoMo Team in case of blockage</p> <p>Make sure that it is clean, and close the toilet please</p>	<p>Хэргэсэн 30 м цагаарын бооцууруу хана руу</p> <p>Зорлонг нь 30СС болонд, Жорлонг бөмбөгөөр бооцааг байнга хэргэснэ</p> <p>Жорлонг танин а цэвэрлэх, татанг нь ургаж ханаг байлгана</p>	<p>Bitte werfen Sie das Papier in den hinteren Teil</p> <p>Bitte helfen Sie die Toilette sauber! Kontaktieren Sie das MoMo-Team!</p> <p>Bitte schließen Sie immer den Toilettendeckel</p>
<p>Don't throw medicine, chemicals or grey water in the toilet</p> <p>Don't throw leftovers, cans, plastic or packages in the toilet</p>	<p>Ысгалтай биеийн хэвдэгдэл хэр нэгдэл, бөмб, ус, бусад хэргэснэ ургаж хана руу</p> <p>Холын үлдэгдэл, галт түүхэн хэр, пластик хэр хангам, хавцалдаг болон хуучирсан сав сууцна хэрэгсэл ургаж хана руу ханаг</p>	<p>Schützen Sie bitte keine Chemikalien, Medizin oder Abwasser in die Toilette.</p> <p>Entsorgen Sie keine Abfälle, Bese, Plastik oder andere Verpackungen in der Toilette.</p>
<p>Cleaning Information</p>	<p>Жорлонг цэвэрлэх заавар</p>	<p>Säuberungshinweise</p>
<p>wipe the toilet seat with water or cleanser</p> <p>clean toilet inside and the underside of the toilet seat</p> <p>clean the toilet inside the rear and the fore part</p> <p>take care of the separation part</p> <p>CONTACT PARTNER: Gansaatir Hirelbaatar - 99397930</p>	<p>Шавартай биеийг ариусгаж чанартай ариусгагч суултуургаар ариусгаж өгнө</p> <p>Суултуурны дотор талыг бооцаж өгнө</p> <p>Суултуурны доод талыг бооцаж өгнө. Бооцаагчид ариусгагчартай</p> <p>Туслахын талыг бооцаж өгнө</p> <p>Холбоо барих хүн: Х. Ганбаатар утас 99397930</p>	<p>Reinigen Sie den Deckel mit kaltem Wasser</p> <p>Reinigen Sie die Deckelinnenseite und den Toilettenrand</p> <p>Reinigen Sie den Boden und die unteren Toilettenflügel</p> <p>Achten Sie auch auf die Trennwand</p> <p>KONTAKT PARTNER: Gansaatir Hirelbaatar - 99397930</p>

Fig. 5: Information sheets „Toilet Use“ in different languages.

Preliminary results

- children stop open defecation and start to use the new toilets
- improvement of hygiene - toilet user keep their toilets clean
- high demand for the iPiT® among neighbours and guests
- high level of acceptance
- demand for fertiliser made from urine and feces is increasing significantly

Key Data

Location:	Darkhan, Mongolia Latitude: 49°30'31" N, Longitude: 105°55'34,5" E
Developer:	Bauhaus-Universität Weimar
Type of pilot measure:	Urine diversion dry toilet and service company for operation
Size of the pilot project:	At 12 families the iPiT® is currently used and optimised

Project Partners & Contact Information

Bauhaus-Universität
Weimar



Dipl.-Ing. Jürgen Stäudel

Chair of Urban Water Management and
Sanitation

e-Mail: juergen.staedel@uni-weimar.de

Internet: www.ipit.eu