



How to Use Human-Centered Design for Sanitation Products

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INTRODUCTION

This document provides guidance on the skills, steps, and resources needed to conduct a rapid human-centered design (HCD) process for improved toilet products in rural areas. The lessons and tips shared are based on work done as part of a broader sanitation market development exercise in the Maradi and Zinder regions of Niger.



Community members look at design options during the co-creation phase.

HCD is a process for understanding people’s needs, preferences, and behaviors to enable working with them to implement the sustainable solutions they value. Using the HCD approach to develop product options allows incorporation of ideas and feedback directly from the people who need improved sanitation solutions to ensure that the final products will meet both the needs and preferences of potential customers. This is especially important when using a market-based approach, as people will be asked to spend their own money on toilets.

REQUIRED SKILLS

A multidisciplinary team with different skills and experience is needed to conduct a successful HCD process for sanitation products. The two most important skill sets are engineering and qualitative research.

The WASH engineer is an essential member of the team. Ideally, the team will consult with an engineer who can suggest designs that have been used successfully in other contexts. The engineer will design products that are structurally sound and meet environmental requirements. The engineer will produce drawings of these products, advise local masons on how to build them, and determine the costs of the products based on the required inputs, in a participatory manner.

The qualitative researcher with experience in HCD makes an important contribution to the process. The researcher provides guidance on the selection of participants, the content of group discussions, and ensures that the results can be fully analyzed and interpreted. The researcher ensures that principles of sustainability are properly applied in each phase of the activity.

In addition to the technical expertise above, community-level activities should be coordinated and led by people who know the communities for which the products are designed. These individuals can liaise with community leaders to identify and recruit participants at all stages of the process. At least one of the facilitators of HCD activities in each community should be a woman.

STEPS AND ACTIVITIES

There are a number of steps and activities required to undertake HCD for sanitation, as shown in Figure 1. In Niger, it took approximately four months to carry out this activity in six localities. However, this did not include the time required to import products. In Niger, SATO¹ products were not available and had to be imported. Importing a product, even in small quantities by air, can take one to two months. Before an HCD activity begins, it is important to confirm that all the likely inputs are available on the local market.

TABLE 1. Overview of the activities and duration of the HCD process in six localities in Niger

ACTIVITY	MATERIALS	EXPECTED RESULTS	WEEKS															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. INSPIRATION																		
<i>Identify the frustrations of the target population and possible solutions</i>	Camera	Photos and notes from observations																
2. CO-CREATION																		
<i>Formulate characteristics of high potential product</i>	Flip chart; photos; demonstration products	Workshop notes																
3. EXHIBITION																		
<i>Verification of the attractiveness of the selected products and the proposed price</i>	Prototypes; questionnaire	Verification of current prices; identification of the best products for the target market																
Design of medium-resolution prototypes	Local unit prices	Plans and bills of quantities (BOQ) and estimates of the prototypes																
Construction of medium-resolution prototypes	Location, materials, and labor	Prototypes																
Display of the medium-resolution prototypes	Exhibition places; tool for collecting feedbacks	Feedback from potential consumers																
4. IMPLEMENTATION AND VERIFICATION																		
<i>Refine selected products</i>	Prototypes	Finished products to introduce to the markets																
Installation of prototypes	Labor and prototype	Products set up in several houses																
Follow-up of prototypes and feedback collection	Data collection tools	Feedback on product performance in households																

¹ SATO (The name comes from SATO's desire to provide a Safe Toilet [SaTo] to everyone around the world.)

In each phase of product design, it is important to include a variety of respondents representative of different market segments. For example, people with and without toilets and people living in peri-urban and rural areas are likely to have different ideas and comments at each stage. Since the products will be marketed to a variety of consumers, it is also important to gather ideas and feedback from both men and women and from people of different ages and means.

In Niger, the prototyping work was carried out in three towns (Hannou Gazane, Kussa, and Bandé); three rural villages (Apke Talaméri, Sawawa Saboua, and Mai Karhi); and three weekly communal markets (Bandé, Guidimouni, and Guidan Roudji). Participants were selected on the basis of their profile, including their experiences in adding value to the prototyping and co-creation work. The selection was made during the inspiration phase in concert with village chiefs, religious leaders, and local masons.

Inspiration

The inspiration phase engages community members in a conversation about their challenges, aspirations, and preferences. Group conversations identify products with high market potential and formulate key characteristics to be retained for attractive products. During this phase, the following information is discovered:

- Acceptable prices and payment terms
- Degree of importance (primary, secondary, optional) given by households to each component of a toilet (stall, interface, pit)
- Feasibility of a self-build approach to toilet components
- Key elements to be guaranteed (privacy, security, ventilation, dimensions, roof, light, flushing, etc.)
- Construction material preferences
- Duration of use before the latrine deemed appropriate



Community members work together on design options during the co-creation phase.

Co-Creation

In the co-creation phase, various community members work together to define the features of potential toilet prototypes. Participants are asked to use their imagination and experience to come up with improved products. They are shown images of existing products and asked how they could be improved. Participants are also asked to draw their ideal toilet and explain its features. At the end of this phase, project leaders have an idea of potential improvements and key features of any new product that will serve as the basis for developing medium-resolution prototypes.

The main improvements suggested by the participants were as follows:

- have latrines with an interface that can be easily cleaned
- preferably have an interface with an obstruction (lid, flap, trap) to block out odors and insects
- have a shower with its latrine integrated into a cement floor
- provide a superstructure, even if it is made of straw, for the privacy of the users
- in the towns, all participants prefer flush toilets, while in the villages, some prefer dry toilets



Community members look at design prototypes displayed in a public area during the exhibition phase.

Exhibition

In the exhibition phase, product prototypes are displayed in a market or other public place to gather user feedback. It is important to note the characteristics of the respondents, such as gender and socioeconomic status, to inform the results. Special attention is given to whether people would be willing to purchase the product now or in the future. Questions asked include the following:

- How do you feel about the price of this product (expensive, cheap, reasonable)?
- Are you ready to buy this product at this price? At what price?
- Are you ready to buy this product now? Why or why not?
- Would you be interested in purchasing this product in the future? When would you be interested in buying this product?
- What is the ideal time to buy these types of products, in your opinion?
- What improvements would you suggest to these products?

Choice of prototypes to be developed for the exhibition phase

At this point, although many product ideas may have surfaced, it is important to narrow down the list of products to test, based on several factors.

A market analysis will provide insights into the types of products most likely to be needed or desired, and this information is supplemented by data collected during the immersion and co-creation phases. For example, the Niger market assessment revealed that while most people need a complete toilet solution, there is also a significant market for improved superstructures and pit covers, and there is a particular desire for flush latrines.

Even in the absence of a thorough market or consumer analysis, certain technical, health, and socioeconomic factors should guide the choice of products or product features to be tested. As part of the iterative process, input from men, women, and children can be useful in refining product offerings.

Potential Factors that Impact Products

- Soil stability
- Likelihood of flooding
- Hygienic characteristics—washable, hygienic storage system
- Availability of emptying services
- Availability of water

Implementation and Verification

In Niger, this phase of implementation of the finished products was carried out in three towns and three villages. In total, eight products were installed in the targeted villages and towns: two types of superstructures (Banco² and straw hut), four models of interfaces (SATO pit inlay, SanPlat slab with SATO pan, manual flush slab with PVC pipe, and SATO platform with concrete pit cover); and three models of pits (1.7 m³ pit made of Banco,

² bricks and clay dried in the sun

1.7 m3 pit made of stones, and 1.7 m3 pit made of mixed Banco and cinder blocks). After three to four weeks of use, researchers returned to the sites to verify the functionality and use of the products. The following questions were posed to the users:

- Do you use this product? If yes, how often?
- Who uses this product (e.g. males, females, neighboring households)?
- How satisfied are you with this product?
- Do you have any other comments or suggestions to improve this product?

All the products were well appreciated by the customers, but the most appreciated was the manual SATO flush.

“ Many people here in the village come to me and ask me to build them the same thing. I recently held a big wedding ceremony without any fear. ”

Preparations

Develop a table of the different products with potential to be confirmed with the different targets in the intervention area. An example from Niger is shown below in figure 2:

TABLE 2. Range of potential products to be evaluated

PRODUCT	OVERVIEW	TARGETS	FEATURES	ESTIMATED COSTS
SUPERSTRUCTURES				
Banco		Urban and rural households with toilets Households with toilets without a durable superstructure	Toilet and shower 2 x 2 x 2	50,000 West African CFA franc (FCFA)
INTERFACES				
Integration of PVC pipe bowl		Urban and rural households with non-improved toilets	Manual flush, local product	6,500 FCFA
SATO pan bowl integration			Manual flush, imported product	3,000 FCFA
PITS				
Stone masonry pit		Urban and rural	Diameter : 1 m Depth : 1.5 m	20,000 FCFA

It is necessary to work with masons or contractors to draw up the BOQ and estimates to determine the costs of each option.

Budget Estimates for HCD

The budget will vary considerably depending on the number of locations each phase of co-creation is conducted. If the project covers a geographically diverse area in terms of cultural, socioeconomic, or environmental factors, testing may be needed on more types of prototypes. The table below shows the costs of the design process in Niger. This budget does not include the cost of staff (see the section Required Skills above) or any training that may be required for staff or partners.

TABLE 3. Costs of the HCD process in Niger

ITEM AND ACTIVITY	UNIT COST (FCFA)	QUANTITY	# OF TIMES OR DAYS	TOTAL COST	COMMENTS
TRAVEL EXPENSES					
Inspiration, per diem	45,000	3 people	15	2,025,000	2 days of immersion per village and per town
Co-creation workshops, per diem	45,000	2 people	15	1,350,000	2 days of ideation workshop per village and town
Exhibition, per diem	45,000	2 people	8	720,000	1 day of exhibition of the prototypes per village and weekly market
Implementation, per diem	45,000	2 people	10	900,000	1 day of product implementation per village and town
Vehicle rental for co-creation, exhibition and implementation mission / Product exhibition in the villages / communes	60,000	1 vehicle	48	2,880,000	
Fuel and tolls for the vehicle for the ideation, exhibition and implementation mission / Exhibition of the products in the villages / communes	500,000	1	1	500,000	
CO-CREATION WORKSHOPS					
Room rental for workshops in villages and towns	30,000	6 workshop rooms	2	360,000	
Transportation and cab costs for participants in the village and town co-creation workshops	3,000	20 participants	12	720,000	
Coffee breaks for participants in the village and town workshops	2,000	20 participants	12	480,000	
MATERIALS					
Design costs for intermediate prototypes (materials and labor)	30,000	9 prototypes	1	30,000	Training can be provided to technicians on the design of preferred latrine types, if necessary
Construction and implementation costs of intermediate products (materials and labor)	50,000	9 prototypes	1		
SATO import fees (including air freight and customs fees)	1,489,684				
Total	2,344,684 FCFA or around 3,974 USD				

CONCLUSION

Implementing an HCD co-creation design process requires careful planning and diversified technical skills that must work in synergy with sufficient material and financial resources. The process has been challenging in Niger because of the lack of local experience in conducting this type of research for sanitation products. Providing mentoring and distance learning on engineering and design processes was time consuming and difficult. However, the process provided feedback from potential customers on several new products that had not yet been introduced to the market in Niger, as well as on how to improve existing, locally manufactured products. The results allowed the team to recommend the products most likely to succeed for a variety of market segments.

PHOTO CREDITS

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ABOUT PRO-WASH

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