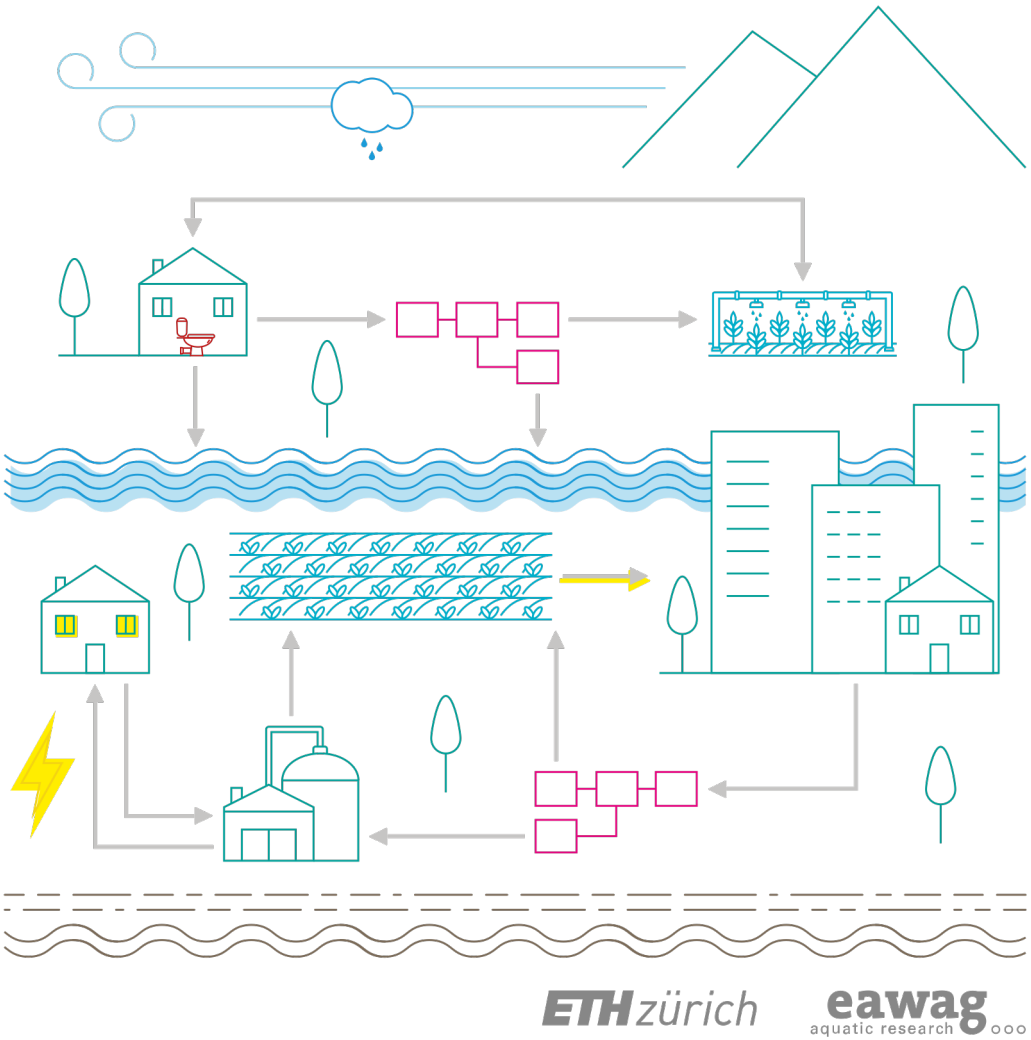


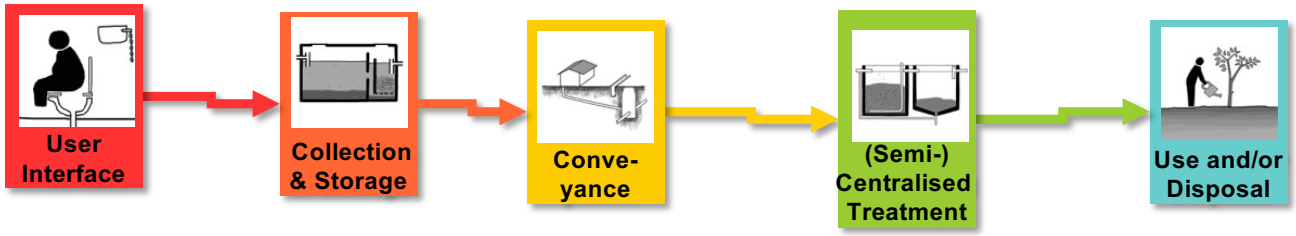
SaniChoice

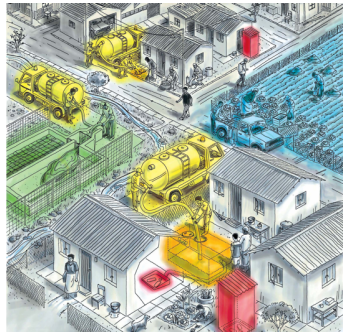
Sanitation technology and system choice for urban planning

Dorothee Spuhler • SuSanA WG1 Meeting •
August 2021

Sustainable Sanitation

HARDWARE: SANITATION SYTEMS





Processes

Planning – Financing – Implementing

Operation & Maintenance – Regulation & Enforcement

SOFTWARE: MANAGEMENT

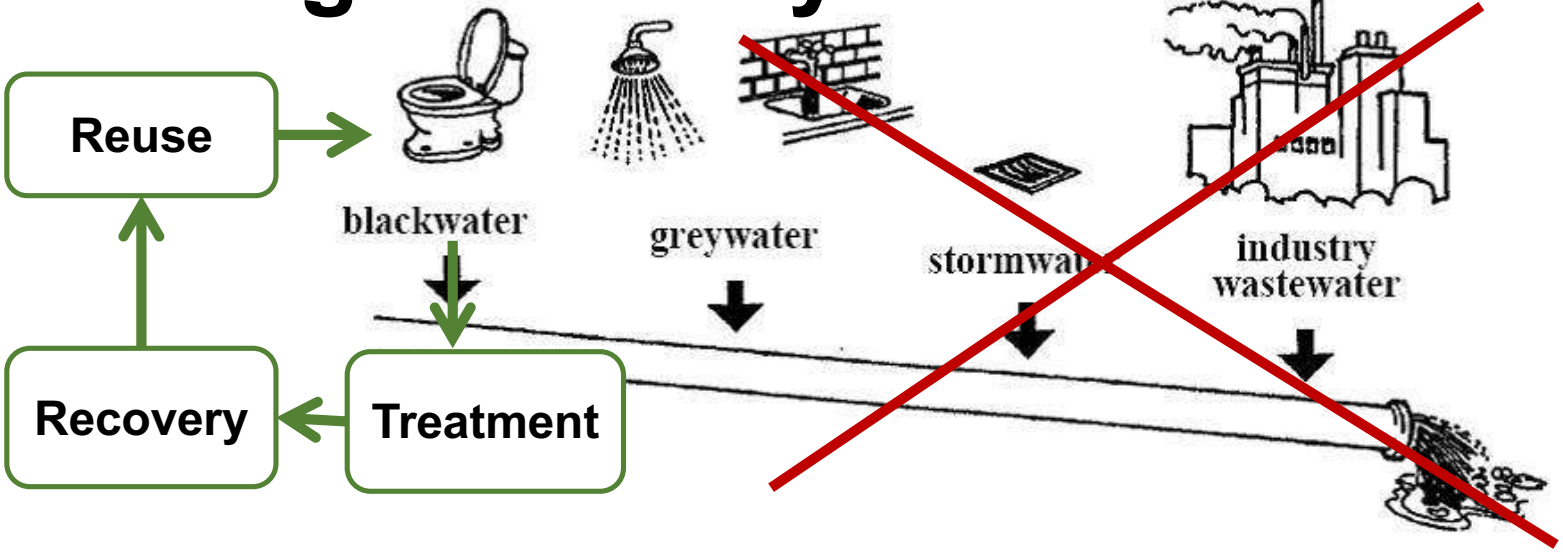
Still many failing projects...

Developing urban areas

- Rapid growth
- High density
- Lack of human and financial resources
- No water and energy

UNDESA 2014 World Urbanization Prospects: The 2014 Revision, Highlights

Novel technologies and systems



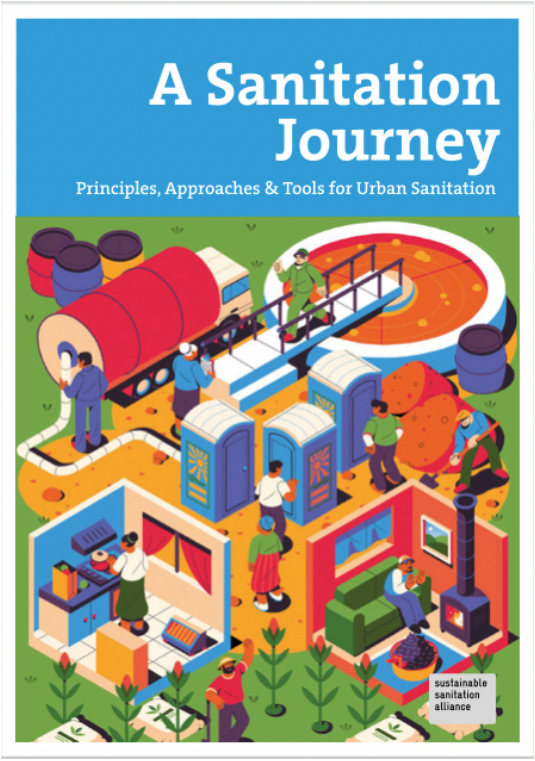
✓ **More appropriate**

- Independent from
  - sewer
  - water
  - energy
- Little space

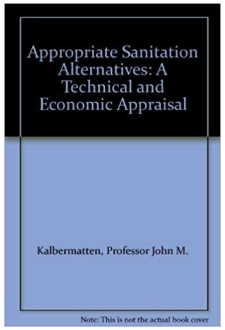
✓ **More sustainable**

- Recovery of resources
- Flexible

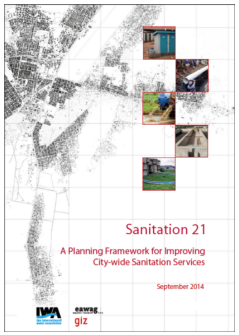
Strategic Planning



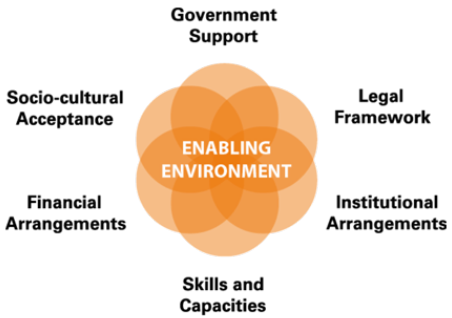
Schertenleib et al. (2021) A Sanitation Journey – Principles, Approaches & Tools.



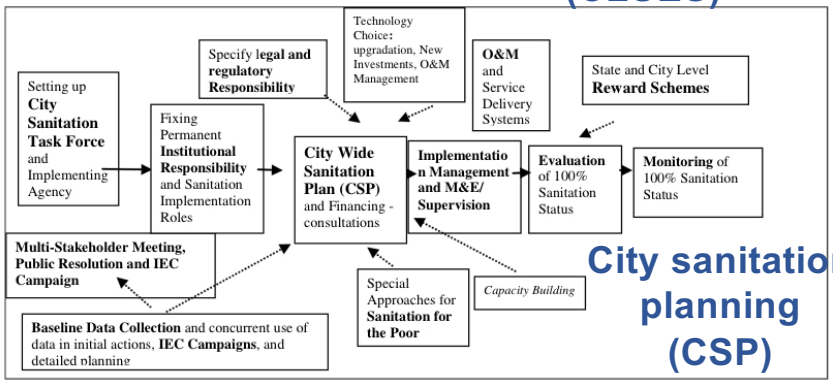
Strategic Sanitation Approach (SSA)



Sanitation21



Community-Led Urban Environmental Sanitation (CLUES)



City sanitation planning (CSP)

City-wide Inclusive Sanitation (CWIS)

CWIS principles

Manila Principles for CWIS

Equity

1. Everyone in an urban area, including communities marginalised by gender, social and economic reasons, benefit from equitable, affordable and safe sanitation services.

Environmental and Public Health

2. Human waste is safely managed along the entire sanitation service chain, starting from containment to reuse and disposal.

Hybrid Technologies

3. A variety of sewered and non-sewered sanitation solutions coexist in the same city, depending on contextual appropriateness and resource recovery potential.

eawag aquatic research

Manila Principles for CWIS

Comprehensive Planning

4. Planning is inclusive and holistic with participation from all stakeholders including users and political actors, with short- and long-term vision, incremental perspective and synergistic with other urban development goals.

Monitoring and Accountability

5. Authorities operate with a clear, inclusive mandate, performance targets, monitoring requirements, human and financial resources, and accountability.

Mix of Business Models

6. Sanitation services are deployed through a range of business models, funding sources, financial mechanisms to reach all members equitably.

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Co ision making problem

What technologies to consider?

How compatible are they?

And how can they be assembled into entire systems?

Multip

umber of

?

And which of these system is the most appropriate in a given context?

Health

Finance

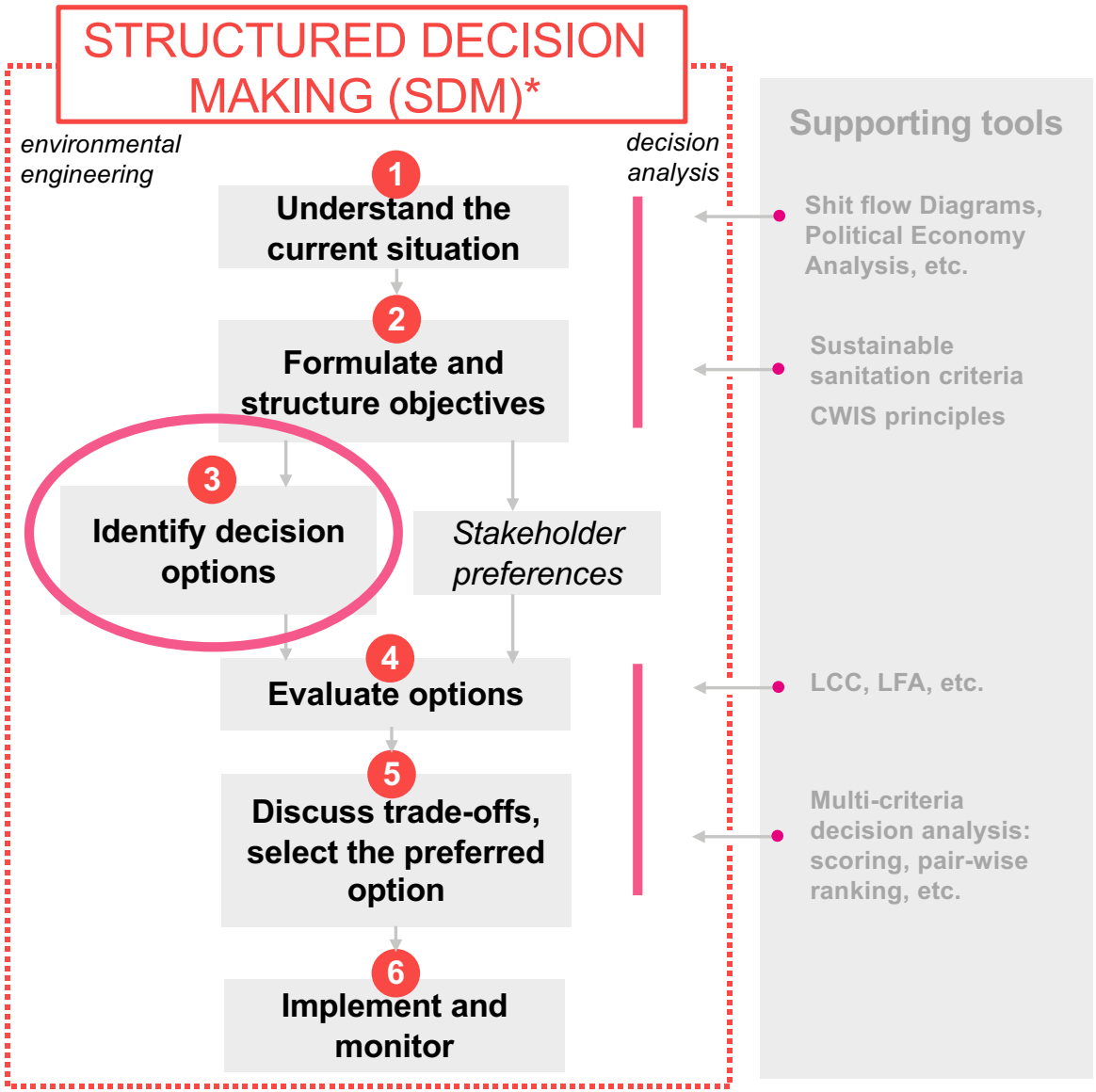
Institutions

And which is the most sustainable?

Various stakeholder, differing preferences

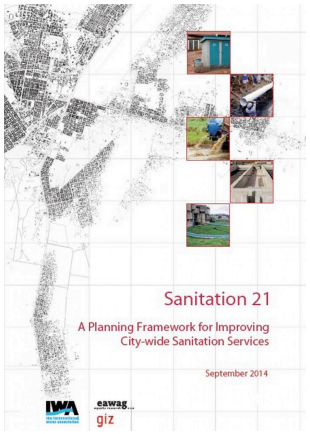
A lack of tools that can consider :

- the entire diversity of novel and conventional technology and system options and
- resource recovery



CLUES

Sanitation 21



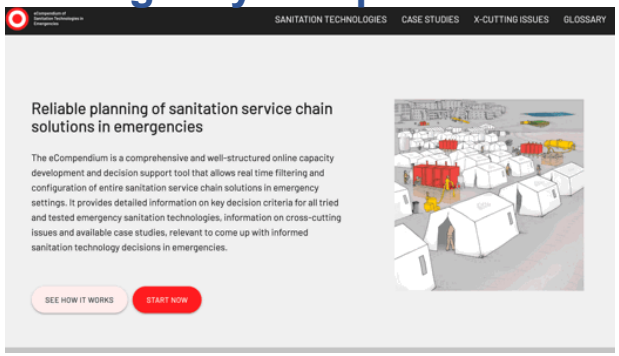
- Structured decision making framework
- Multi-stakeholder and multi-criteri

Based on previous experiences

Compendium

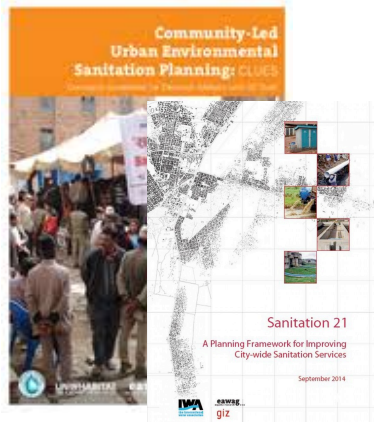
- Expert knowledge
- Generic definition of technologies
- Templates: systematic overview on all types of systems

Emergency compendium



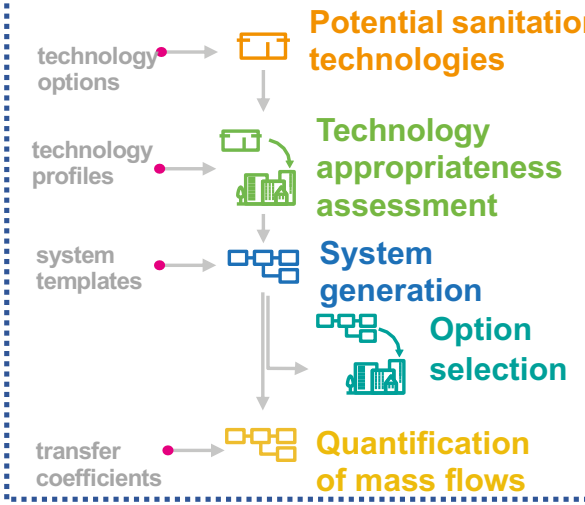
- Accessible
- Flexible
- Easily navigable
- First filter function (some sort of interactivity)

CLUES / Sanitaiton 21



- Structured decision making framework
- Multi-stakeholder and multi-criteria

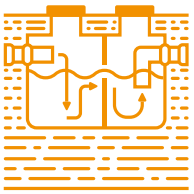
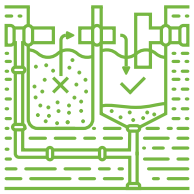
SANTIAGO *



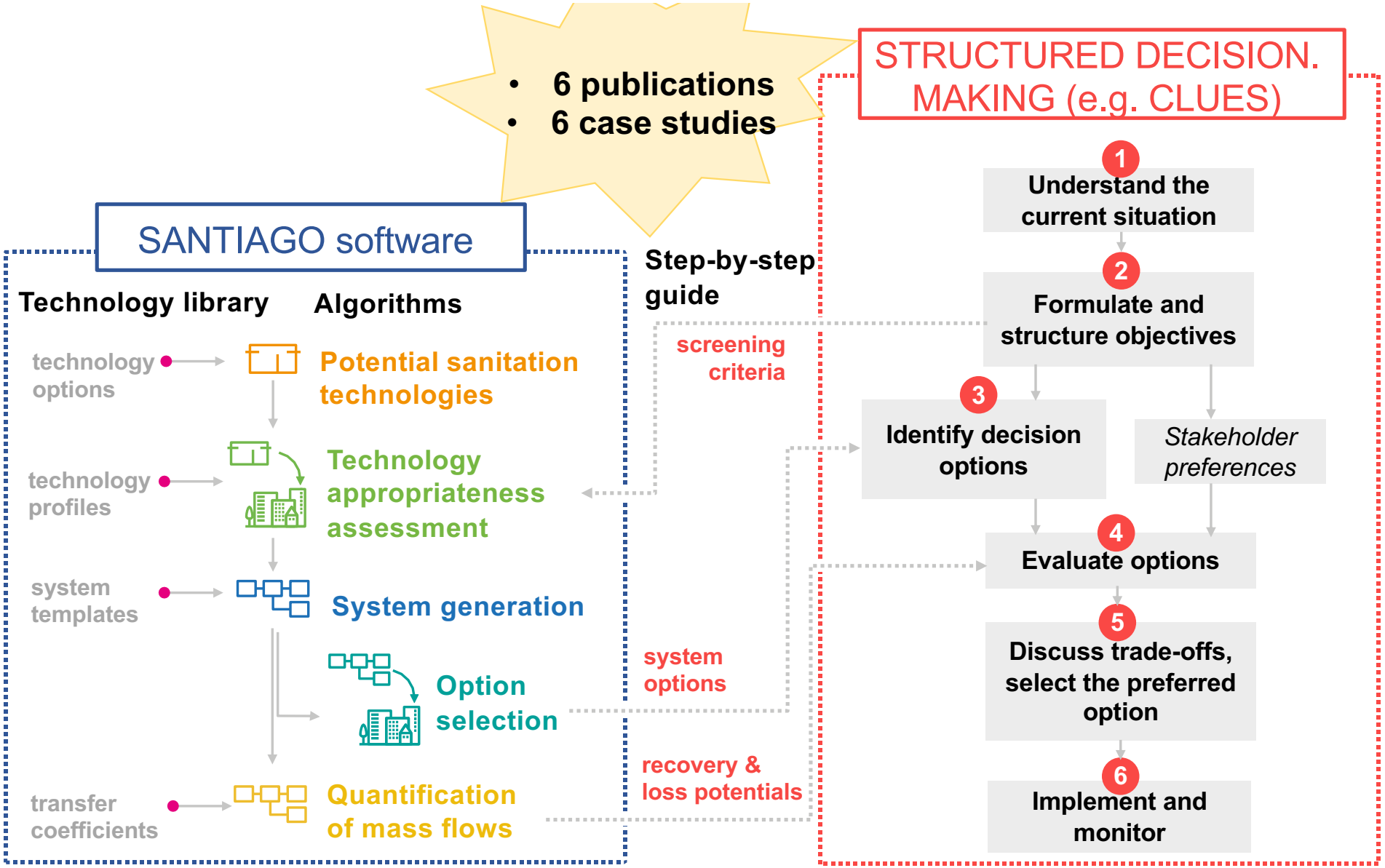
*SANitation sysTem Alternative GeneratOr

- Transparent and evidence-based evaluation of local appropriateness
- Enforcement to look at entire systems
- Resource recovery potentials as one evaluation criteria

Compendium

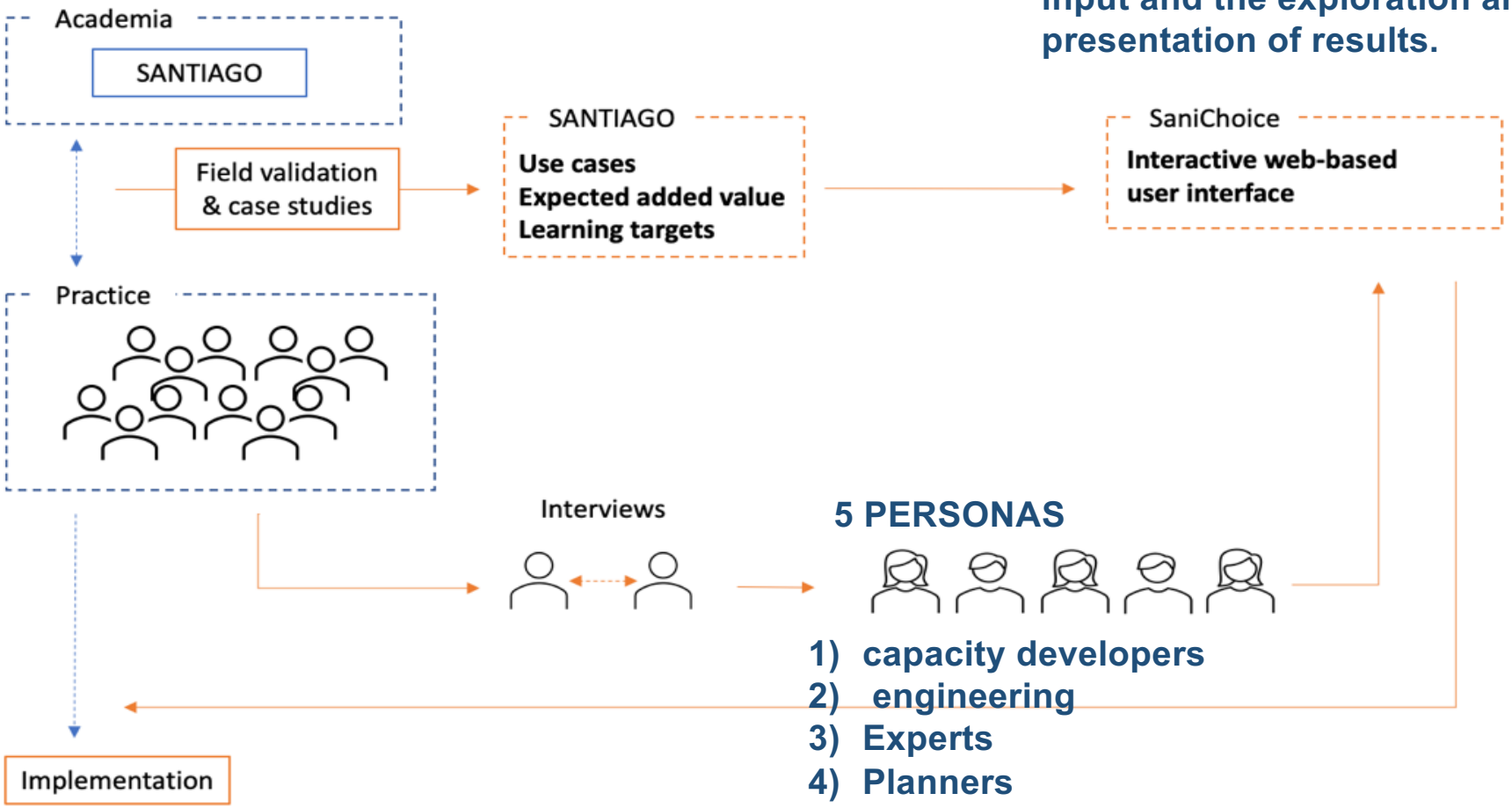
U	S	C	T	D
				
User interface	**Storage & treatment**	**Conveyance**	**(Semi-) centralized Treatment**	**Reuse or disposal**
6	**6**	**6**	**6**	**6**
•Dry toilet • Urine diverting Dry Toilet • Urinal • Pour-flush toilet • Flush Toilet • Urine diverting flush toilet • Etc.	•Single Pit • Single VIP • Dehydration vaults • Septic tank • Composting chamber • Anaerobic baffled reactor • Anaerobic Filter • Etc.	•Human-Powered emptying and transport • Motorized emptying and transport • Simplified sewer • Small-bore sewer • Conventional gravity sewer • Etc.	•Anaerobic Baffled Reactor • Anaerobic Filter • Waste Stabilisation Ponds • Activated Sludge • Constructed Wetland • Co-composting	•Application of urine • Application of stab. sludge • Irrigation • Aquaculture • Soak Pit • Leach Field • Land application • Surface disposal • Etc.

*** 6 * 6 * 6 * 6 = 7’776 systems**


• 6 publications
• 6 case studies
STRUCTURED DECISION. MAKING (e.g. CLUES)
1 Understand the current situation
2 Formulate and structure objectives
3 Identify decision options
Stakeholder preferences
4 Evaluate options
5 Discuss trade-offs, select the preferred option
6 Implement and monitor
SANTIAGO software
Technology library
Algorithms
technology options
Potential sanitation technologies
technology profiles
Technology appropriateness assessment
system templates
System generation
Option selection
transfer coefficients
Quantification of mass flows
Step-by-step guide
screening criteria
system options
recovery & loss potentials

From software to tool

facilitates data collection and input and the exploration and presentation of results.

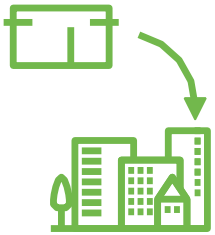


1) capacity developers
2) engineering
3) Experts
4) Planners
5) researchers, teachers and trainers.

SaniChoice Design considerations

- ✓ Enable the consideration of broad range of conventional and novel technology system options:
  - ✓ Generic and flexible to be applicable to any (new) technology and case

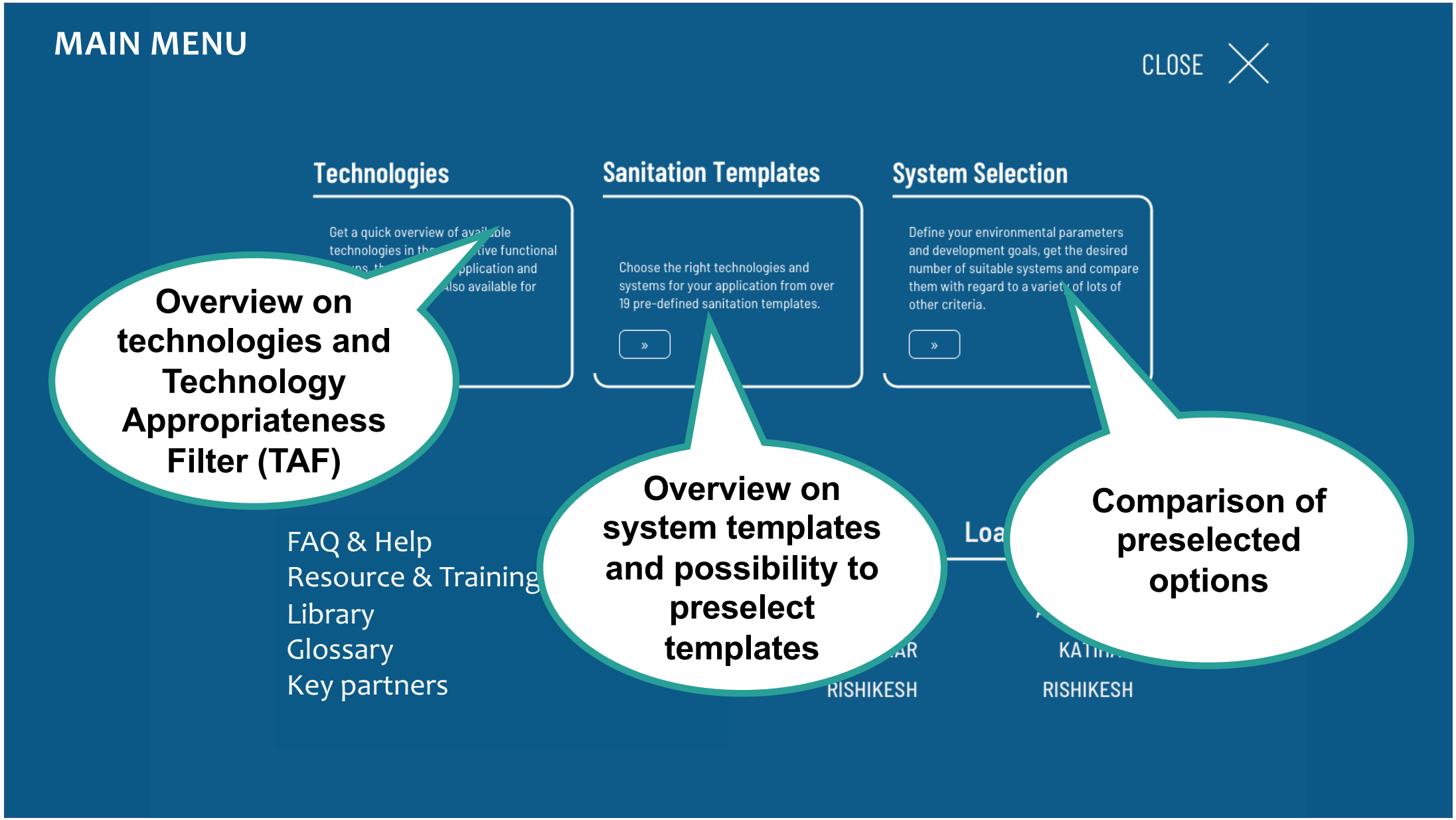
  - ✓ Enforces consideration of entire systems

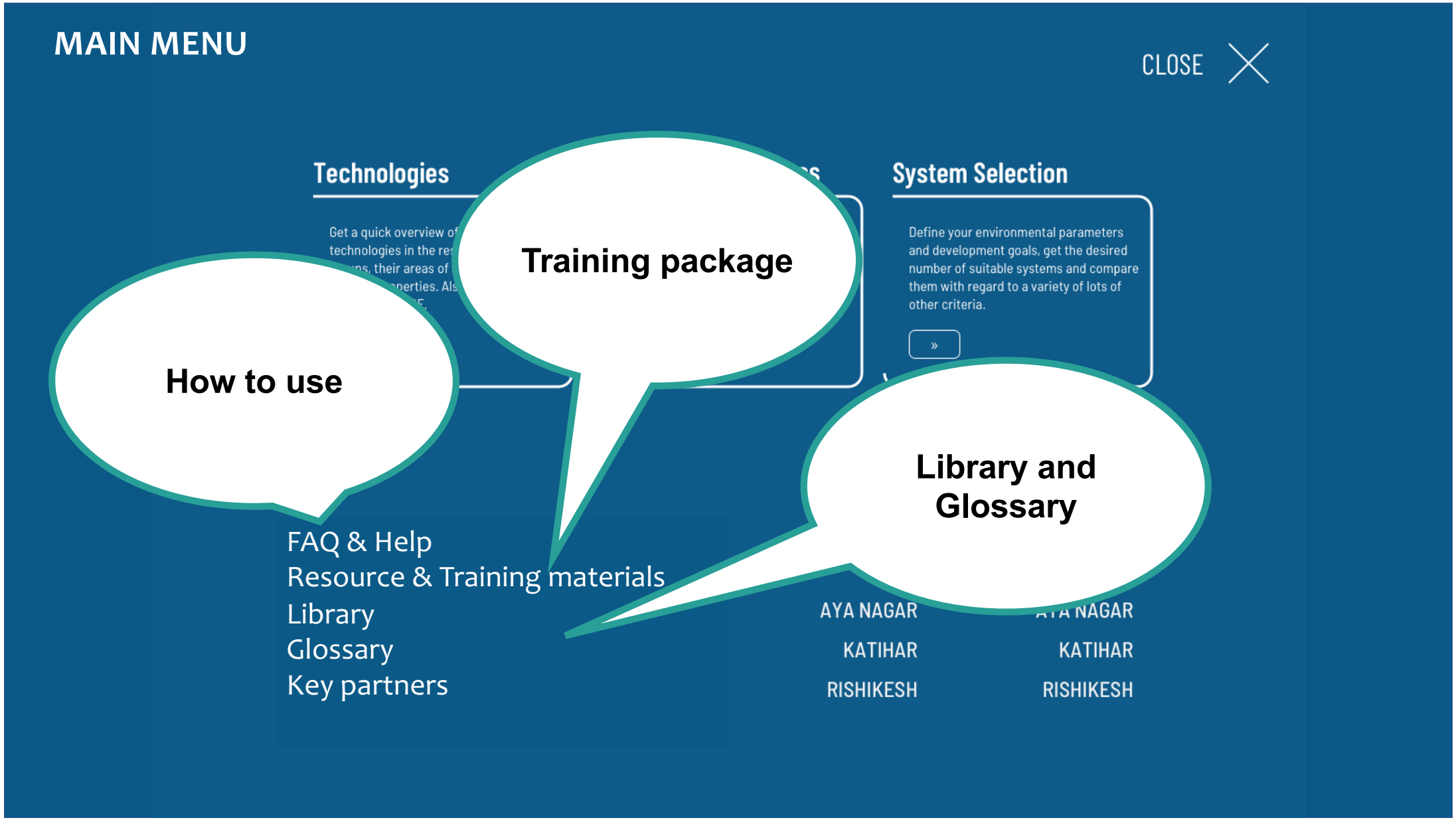


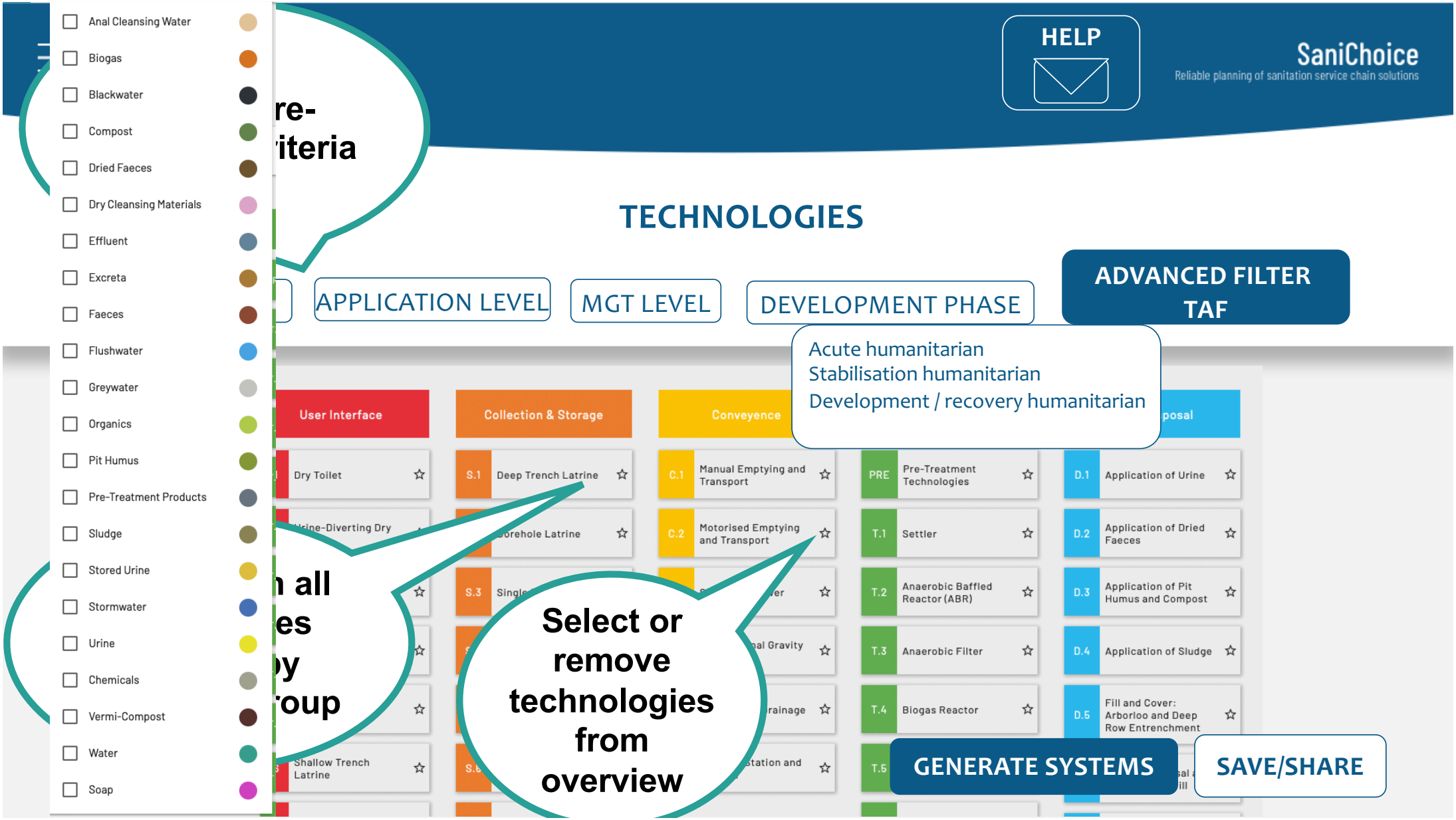
    - ✓ Streamlining planning process by enabling pre-selection of appropriate and sustainable options
      - ✓ Systematic and thus transparent, no black box solution provision but informed choice
        - ✓ Consideration of specific local conditions
        - ✓ Evidence based on international literature and expert knowledge

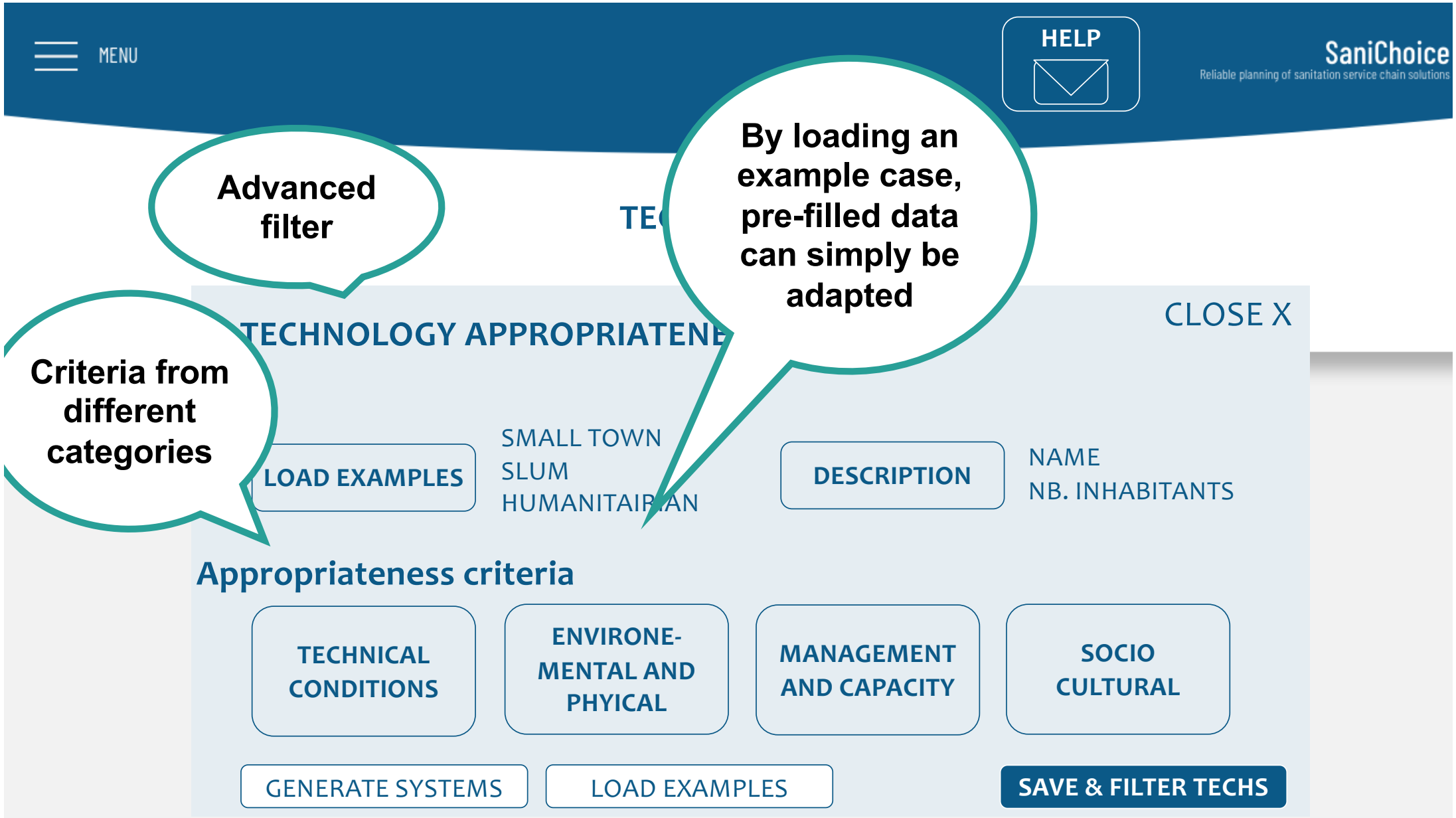
- ✓ Easy to use: from simple and quick information to complex planning support
- ✓ Possibility to share results


MENU
HELP
SaniChoice
Reliable planning of sanitation service chain solutions
Four main services
www.SANICHOICE.info
Sanitation technology and system choice for urban planning
SaniChoice is a capacity building and decision support tool that enables informed Sanitation Technology and System choice for Strategic Planning.
1. Find appropriate sanitation technologies for the community and city level
2. Build entire and valid sanitation value chains
3. Compare different options to find your preferred solutions
4. Share your results in workshops and reports
eawag aquatic research
sustainable sanitation alliance
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Agency for Development and Cooperation SDC
Contact | Legal Notice | Privacy Policy


MAIN MENU
CLOSE
Technologies
Get a quick overview of available technologies in the ...tive functional ...pplication and ...lso available for
Sanitation Templates
Choose the right technologies and systems for your application from over 19 pre-defined sanitation templates.
»
System Selection
Define your environmental parameters and development goals, get the desired number of suitable systems and compare them with regard to a variet of lots of other criteria.
»
Overview on technologies and Technology Appropriateness Filter (TAF)
Overview on system templates and possibility to preselect templates
Comparison of preselected options
FAQ & Help
Resource & Training
Library
Glossary
Key partners
Loa
RISHIKESH
RISHIKESH

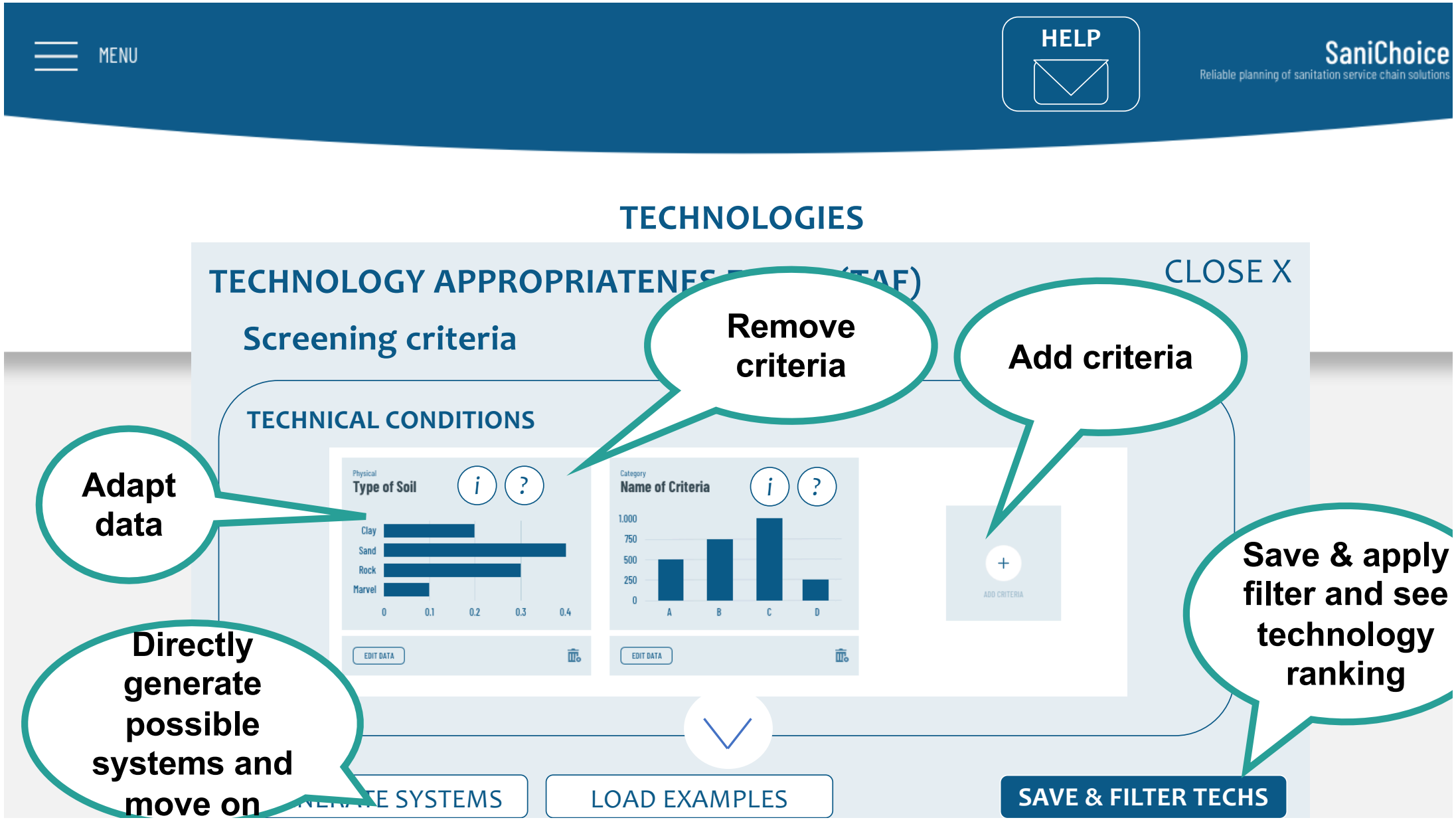

MAIN MENU
CLOSE
Technologies
Get a quick overview of technologies in the re
ps, their areas of
perties. Als
System Selection
Define your environmental parameters and development goals, get the desired number of suitable systems and compare them with regard to a variety of lots of other criteria.
»
Training package
How to use
Library and Glossary
FAQ & Help
Resource & Training materials
Library
Glossary
Key partners
AYA NAGAR
KATIHAR
RISHIKESH
AYA NAGAR
KATIHAR
RISHIKESH


HELP
SaniChoice
Reliable planning of sanitation service chain solutions
re-
iteria
TECHNOLOGIES
APPLICATION LEVEL
MGT LEVEL
DEVELOPMENT PHASE
ADVANCED FILTER TAF
Acute humanitarian
Stabilisation humanitarian
Development / recovery humanitarian
Anal Cleansing Water
Biogas
Blackwater
Compost
Dried Faeces
Dry Cleansing Materials
Effluent
Excreta
Faeces
Flushwater
Greywater
Organics
Pit Humus
Pre-Treatment Products
Sludge
Stored Urine
Stormwater
Urine
Chemicals
Vermi-Compost
Water
Soap
h all
es
y
roup
User Interface
Collection & Storage
Conveyence
posal
Dry Toilet
Deep Trench Latrine
Manual Emptying and Transport
Pre-Treatment Technologies
Application of Urine
Urine-Diverting Dry
Borehole Latrine
Motorised Emptying and Transport
Settler
Application of Dried Faeces
Anaerobic Baffled Reactor (ABR)
Application of Pit Humus and Compost
Anaerobic Filter
Application of Sludge
Biogas Reactor
Fill and Cover: Arborloo and Deep Row Entrenchment
Shallow Trench Latrine
Select or remove technologies from overview
GENERATE SYSTEMS
SAVE/SHARE


MENU
HELP
SaniChoice
Reliable planning of sanitation service chain solutions
Advanced filter
By loading an example case, pre-filled data can simply be adapted
Criteria from different categories
TECHNOLOGY APPROPRIATENE
CLOSE X
LOAD EXAMPLES
SMALL TOWN
SLUM
HUMANITAIRIAN
DESCRIPTION
NAME
NB. INHABITANTS
Appropriateness criteria
TECHNICAL CONDITIONS
ENVIRONE-MENTAL AND PHYICAL
MANAGEMENT AND CAPACITY
SOCIO CULTURAL
GENERATE SYSTEMS
LOAD EXAMPLES
SAVE & FILTER TECHS

Currently implemented criteria

TECHNICAL CONDITIONS	ENVIRONE-MENTAL AND PHYICAL	MANAGEMENT AND CAPACITY	SOCIO CULTURAL	HUMANI-TARIAN
• Water Supply • Water Volume • Electricity Supply • Fuel Supply • Frequency of Operation and Maintenance (O&M) • Pipe Supply • Pump Supply • Concrete Supply • Spare Parts Supply	• Temperature • Flooding • Vehicular Access • Slope • Soil Type • Groundwater Depth • Excavation • Surface Area (Onsite) • Surface Area (Offsite)	• Drinking Water Exposure • Construction Skills • Design Skills • Operation and Maintenance (O&M) Skills • Cleansing Method	• Cleansing Method	• Expected Lifetime • Speed of implementation for toilet structure • Speed of implementation for treatment • Scalability • Construction parts supply


MENU
HELP
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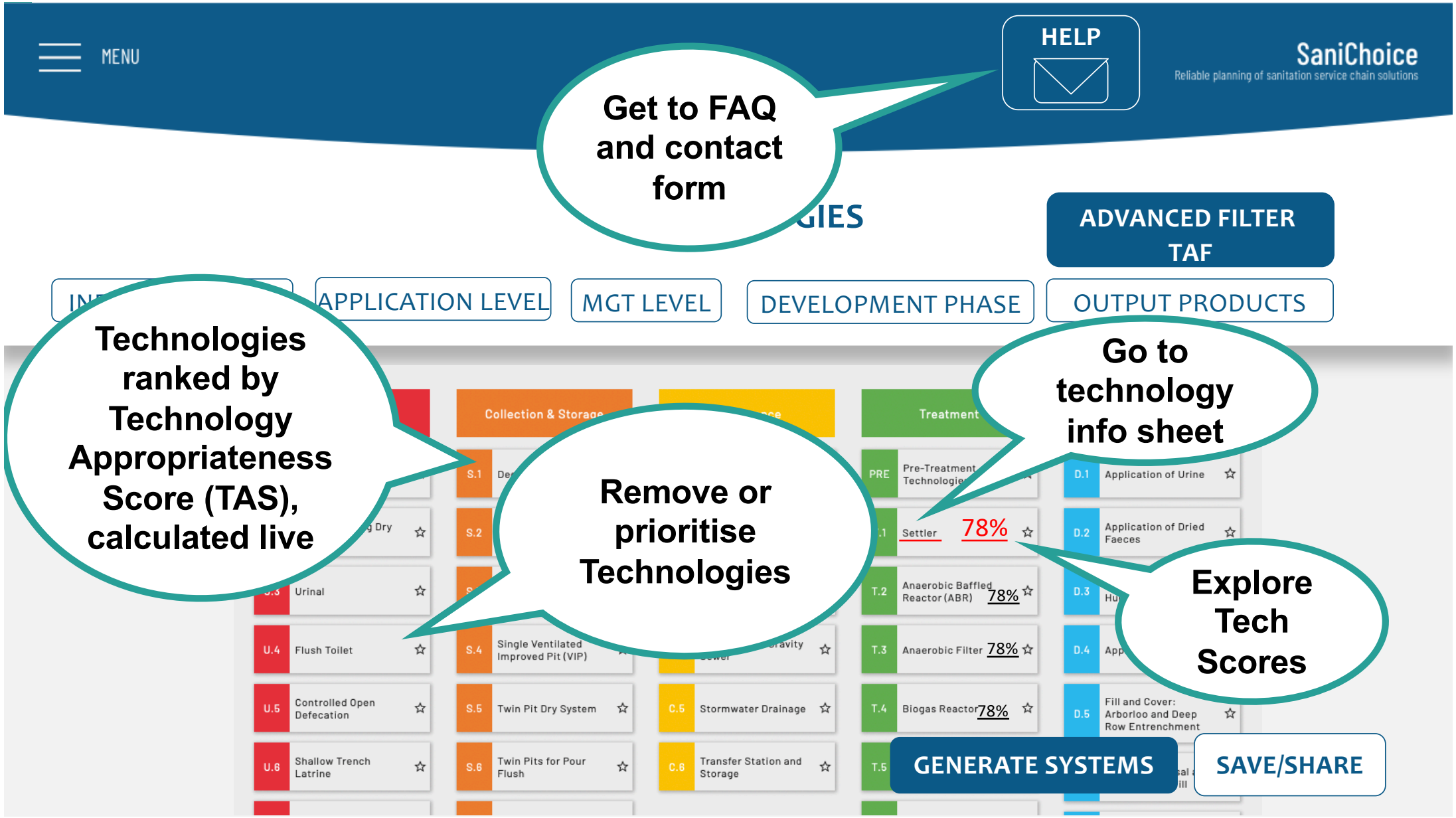
Reliable planning of sanitation service chain solutions
TECHNOLOGIES
TECHNOLOGY APPROPRIATENES (TAF)
CLOSE X
Screening criteria
TECHNICAL CONDITIONS
Remove criteria
Add criteria
Adapt data
Physical
Type of Soil
Clay
Sand
Rock
Marvel
0
0.1
0.2
0.3
0.4
EDIT DATA
Category
Name of Criteria
1.000
750
500
250
0
A
B
C
D
EDIT DATA
ADD CRITERIA
Directly generate possible systems and move on
Save & apply filter and see technology ranking
LOAD EXAMPLES
SAVE & FILTER TECHS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Get to FAQ and contact form
GIES
ADVANCED FILTER TAF
APPLICATION LEVEL
MGT LEVEL
DEVELOPMENT PHASE
OUTPUT PRODUCTS
Technologies ranked by Technology Appropriateness Score (TAS), calculated live
Remove or prioritise Technologies
Go to technology info sheet
Explore Tech Scores
Collection & Storage
Treatment
U.4 Flush Toilet
U.5 Controlled Open Defecation
U.6 Shallow Trench Latrine
S.4 Single Ventilated Improved Pit (VIP)
S.5 Twin Pit Dry System
S.6 Twin Pits for Pour Flush
C.5 Stormwater Drainage
C.6 Transfer Station and Storage
PRE Pre-Treatment
T.1 Settler 78%
T.2 Anaerobic Baffled Reactor (ABR) 78%
T.3 Anaerobic Filter 78%
T.4 Biogas Reactor 78%
D.1 Application of Urine
D.2 Application of Dried Faeces
D.5 Fill and Cover: Arborloo and Deep Row Entrenchment
GENERATE SYSTEMS
SAVE/SHARE

MENU

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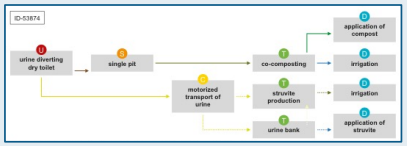
SYSTEM SELECTION

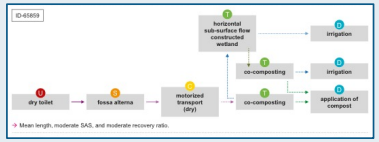
Compare systems

COMPARE & EVALUATE SYSTEMS

CLOSE X

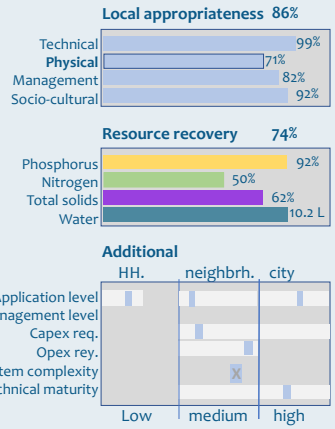


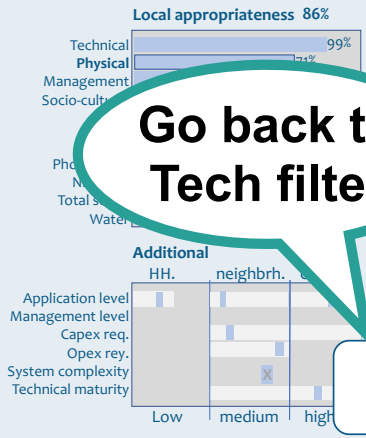
ST.8
Sys 12001



ST.12
Sys 901

ST.16
Sys 1111





Go back to Tech filter

Details comparison

Save for later or share online or for reports

ADAPT TAF

DASHBOARD

SAVE/SHARE

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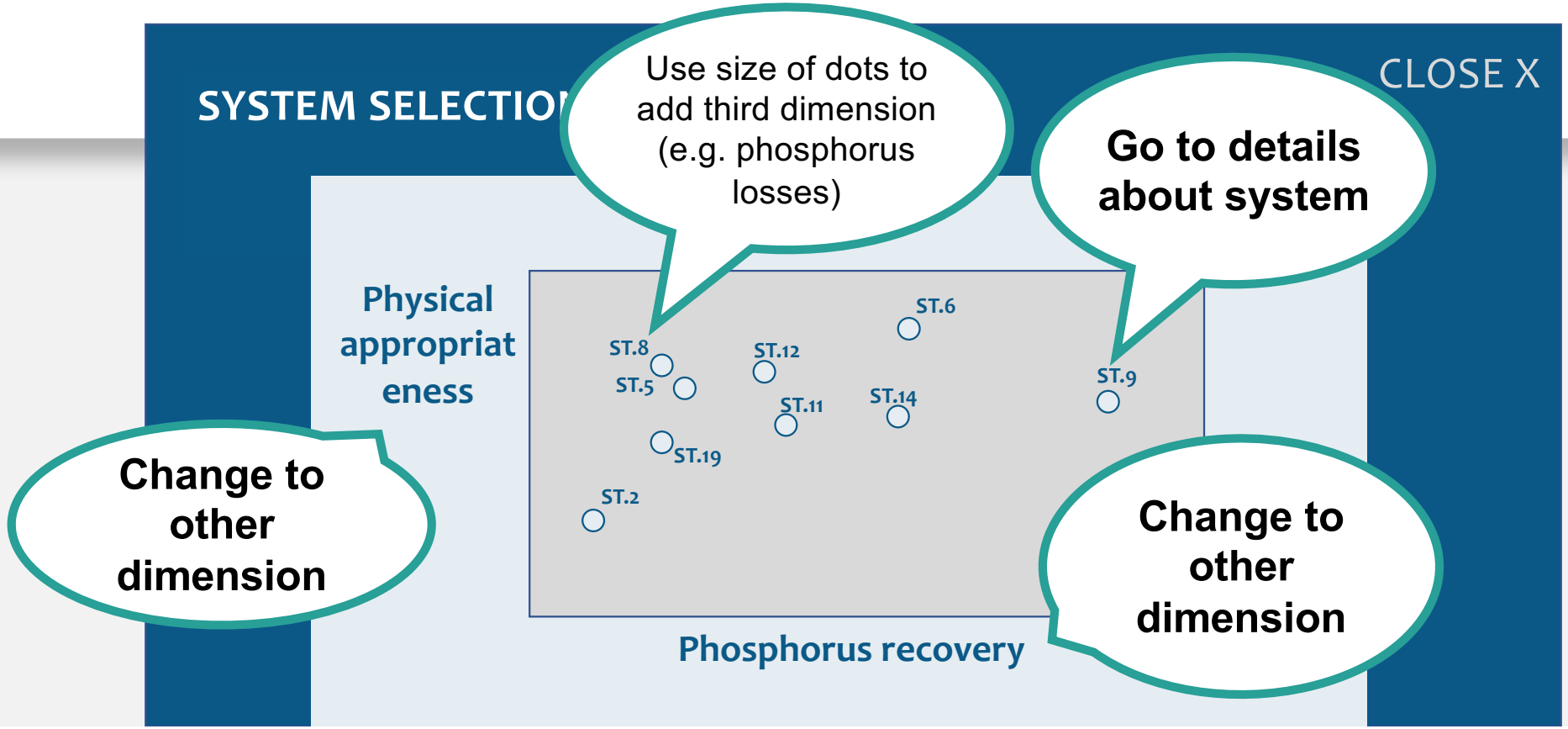
SYSTEM SELECTION



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Reliable planning of sanitation service chain solutions

www.SANICHOICE.info
Sanitation technology and system choice for urban planning

- ✓ **Large and diverse range** of conventional and novel technologies and systems
- ✓ International literature & expert knowledge accessible for **more evidence-based** planning
- ✓ **Interactive** to consider local conditions systematically and transparently
- ✓ Applicable with data available at a **pre-planning phase** considering uncertainties
- ✓ **Flexible** to include (future) technologies and any case
- ✓ Provide options that one might not have thought of based on experience alone to **think out of the box**
- ✓ Allows to easily **extract and** share results transparently

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sustainable sanitation alliance

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

SaniChoice Use Cases

PLANNING AND DECISION MAKING

- Compare technologies
- Developing mix of sanitation system for city sanitation plan
- Compare options and balance for trade-offs

TRAINING AND CAPACITY DEVELOPMENT

- Technology and system options
- Appropriateness criteria and relevance of contextualized evaluation
- Multi-criteria decision making

AWERENESS RAISING

- Diversity of viable options
- Relevance of technology interaction
- Possibilities for resource recovery

MENU

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SaniChoice
Reliable planning of sanitation service chain solutions

www.SANICHOICE.info
Sanitation technology and system choice for urban planning

- Launch in October 2021
- Stay tuned!
- Contact us to become a test user: dorothee.spuhler@eawag.ch
- Thank you!

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sustainable sanitation alliance

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Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

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