



CLARA SIMPLIFIED PLANNING TOOL

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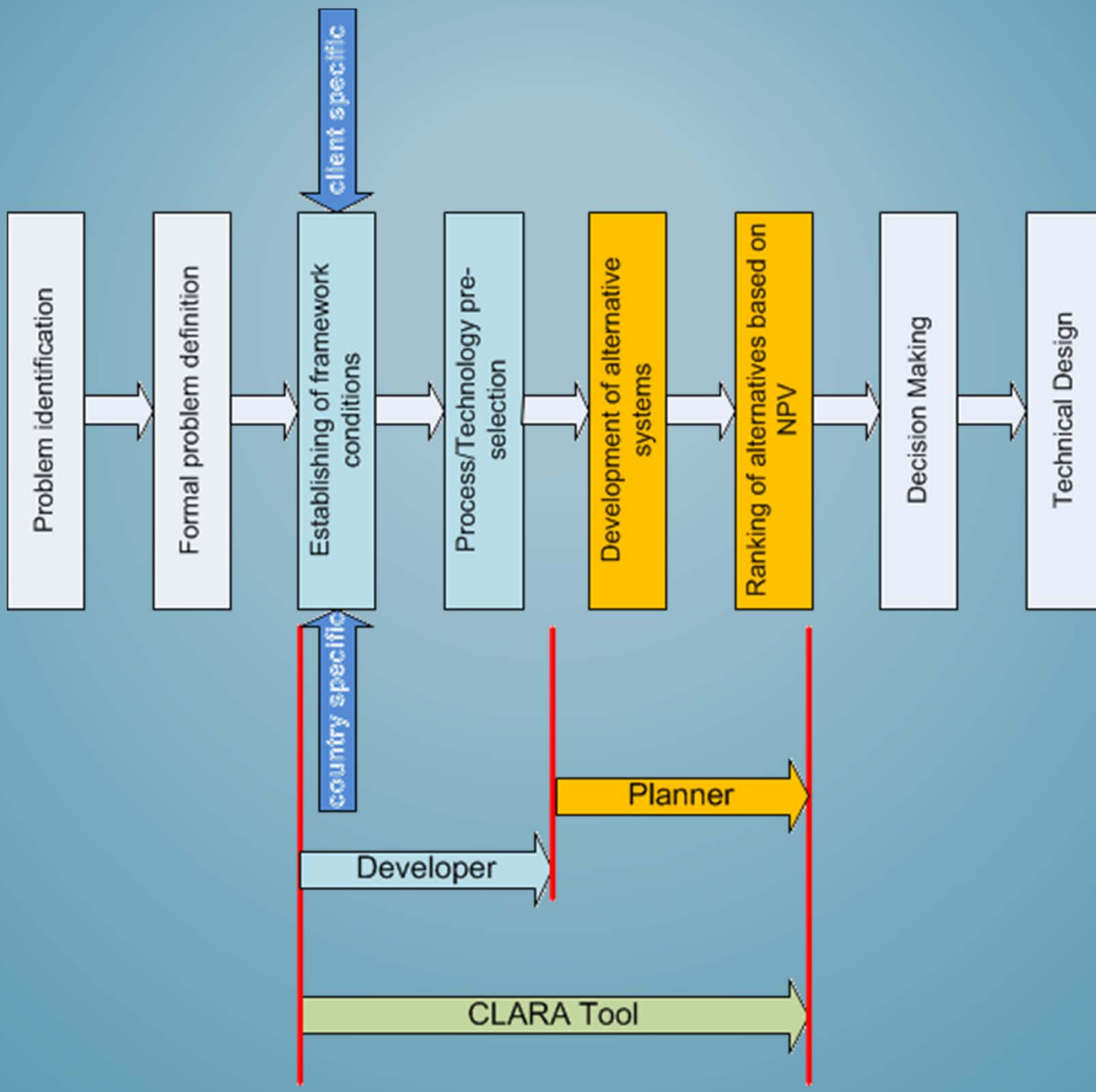
PURPOSE

- *compare alternative **sanitation systems** at an early stage of the planning process*
- *objectively and*
- *transparent*
- *encourage planners to compare systems and not technologies*
- *encourage planners & decision makers to include resource oriented sanitation system in the decision making process*
- *include o&m of systems*



TARGET GROUP

- *professional planners*
at the
- *pre-planning stage*





SANITATION SYSTEM

chain of

- *storage*
- *collection*
- *transport*
- *treatment*
- *reuse*
- *disposal*

processes / technologies



DEVELOPER

selects processes / technologies which can be combined to sanitation systems according to

- country-specific and
- client-specific requirements



EXAMPLE



Fridge:

- *Criterion 1: energy consumption < 310kWh/year*
- *Criterion 2: volume > 2 cfeet*



KWH/YEAR

10.3



CUBIC FEET



KWH/YEAR

2.9

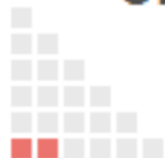


CUBIC FEET



KWH/YEAR

3.6



CUBIC FEET



FUNCTIONAL GROUPS	1,1	<i>Extraction from spring</i>
	1,2	<i>Groundwater extraction (Borehole)</i>
TECHNOLOGIES	1,3	<i>Riverwater extraction (+ screen)</i>
	2,1	<i>Surface Water treatment (Grit Channel + Slow Sand Filter)</i>
	2,2	<i>Flocculation and Sedimentation</i>
	2,3	<i>Chlorination</i>
	3,1	<i>Water Tank (Surface)</i>
	3,2	<i>Water Tank (Elevated)</i>
	3,3	<i>Water pumping station</i>



SPT STRUCTURE

- *Technology Descriptions*
- *Technical Drawings*
- *(Project references)*
- *Bills of Quantities*
- **Cost functions**

- *Alternatives*
- ΣNPV (invest. + o&m)
- *Comparison*



1.1 Sewer

Description

A sanitary sewer is used for transporting the sewage from houses to a treatment plant.

For inspection and renewal works manholes are placed at different points in the network. Flow by g

Design assumptions

- Minimum design flow rate 0.6 m/s
- 80 L/PE/d
- Excavation volume and type of trench according to pipe depth
- Pipe material PVC
- ave. manhole distance 35m

Input data (planner)

- (1) PE (wastewater disposed of via sewer)
- (2) Length [m]
- (3) Ave. depth [m]
- (4) Surcharge (e.g. road rehabilitation, excavation in rock, etc.) [%]

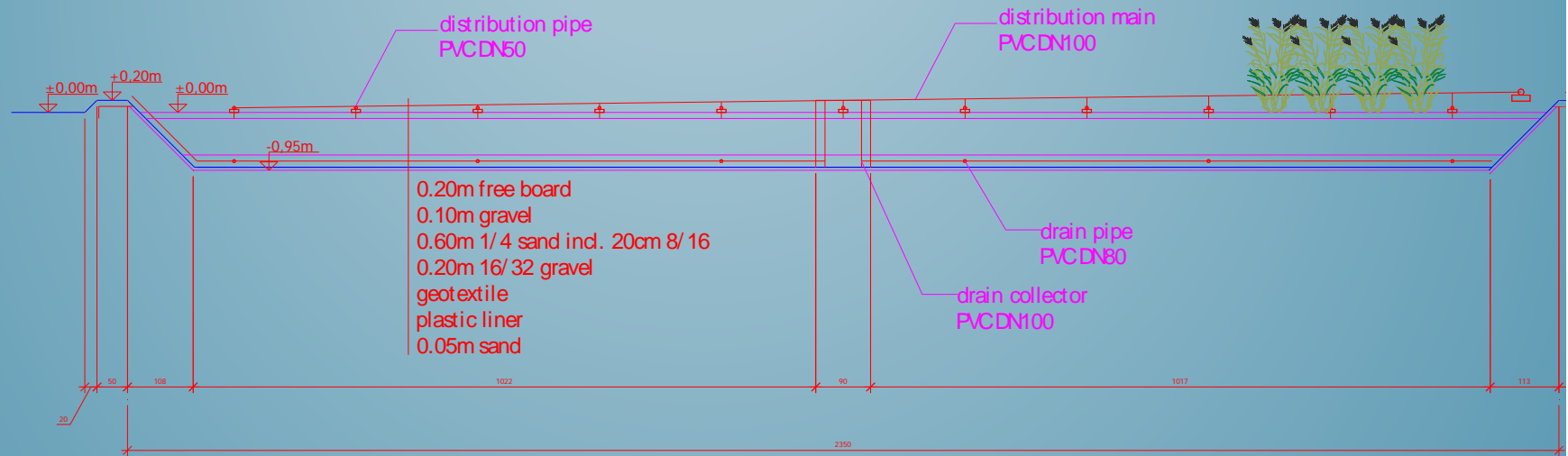
Input data (Cost function)

Excavation volume

Lifespan



Section A-A





	Item no.	Short text		Quant.	Quant.	Quant.	Quant.	
		size	m2	8	20	100		
LG	02	PREPARATORY AND FINISHING WORKS						
U1	0202	Preparatory and finishing works						
020201A		Clearing area	m2	32,55	54,16	166,84	52	
Total 02		PREPARATORY AND FINISHING WORKS						
LG	03	EARTHWORK						
U1	0302	Topsoil						
030201A		Remove topsoil	m3	3,26	5,42	16,68	5	
U1	0303	Excavation						
030331A		Pit excavation with inward-sloping	m3	7,36	18,70	97,42	41	
U1		Backfilling						
035101D		Gravel 8-16 mm	- for protection layer on top	m3	1,52	3,08	12,33	4
035101D		Gravel 4-8 mm	- intermediate layer to prevent	m3	0,80	2,00	10,00	4
035101D		Gravel 16-32 mm	- for drainage layer (0.2m thick)	m3	0,61	2,30	15,82	7
035101A		Sand 1-4 mm washed	- filter material (0.6m)	m3	3,67	9,78	53,10	23
035101A		Sand 1-4 mm washed	- sand levelling layer underneath	m3	0,76	1,54	6,16	2
030710A		Dam embankment		m3	3,76	5,36	10,75	2
U1	0309	Geotextiles						
030901A		Filter and drainage geotextile	m2	43,75	72,34	208,77	61	
Total 03		EARTHWORK						
LG	11	CONCRETE WORKS						
U1	1108	In situ manholes, small concrete structures						
110801A		In situ manholes, small concrete structure	- outlet structure	m3	0,64	0,65	0,67	
111902A		Ribbed steel <10mm	- outlet structure	kg	64,33	65,01	67,31	7



Project Information

Save

Save As...

Open SPT Manager

Check

Project Title

Meaningful Project Title

Period of Consideration [Years]

50

Net Interest Rate [%]

3

Expected Annual Growth [%]

0,5

Justification/Source:

Add argumentation here....

Change in cost since release 2013 [%]

5

Alternative Labels/Names

Alternative #1

Alternative #2

Alternative #3

Alternative #4

Technology Documentation Folder



E:\Dropbox\CLARA\2_cost functions\

2

Online Documentation Folder



http://clara.boku.ac.at/images/doc/xxxx

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CLARA SPT Draft Version 1.1.2



RECOMMENDATIONS FOR USERS

- *don't assume*
- *don't eliminate alternatives because of perceived deficits, e.g. capacities for o&m, rather reflect lack of local capacities by increasing cost for o&m (buy external expertise)*
- *use tool for sensitivity analyses*



COST
FUNCTION
(INVESTMENT +
O&M)

$$\text{cost} = f(\text{input parameters } a-z)$$

