Sanitation Safety Planning to ensure RRR business models protect health



But first....a reminder of public health risk associated with reuse

Direct Health Effects

- Disease outbreaks
 (food, water and vector borne)
- Persistent diseases
 (e.g. intestinal helminth infections, diarrhoeal diseases)
- Non-communicable diseases (e.g. from industrial waste)

Indirect Health Effects

- Adverse impacts on the safety of drinking-water, food and bathing water.
- Positive impacts on household food security and nutrition



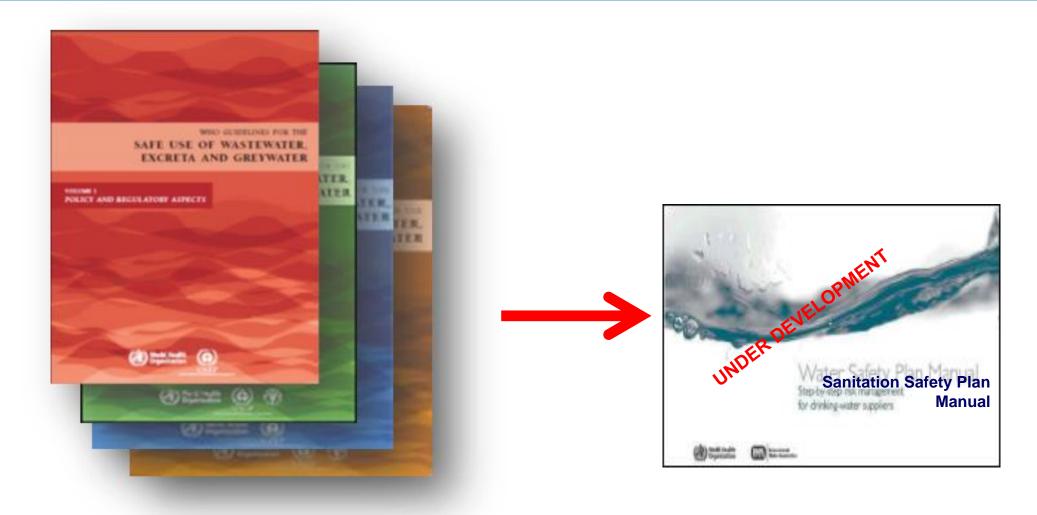
Fish concentrate microbes in their intestines



Ascaris in untreated wastewater and feacal sludge

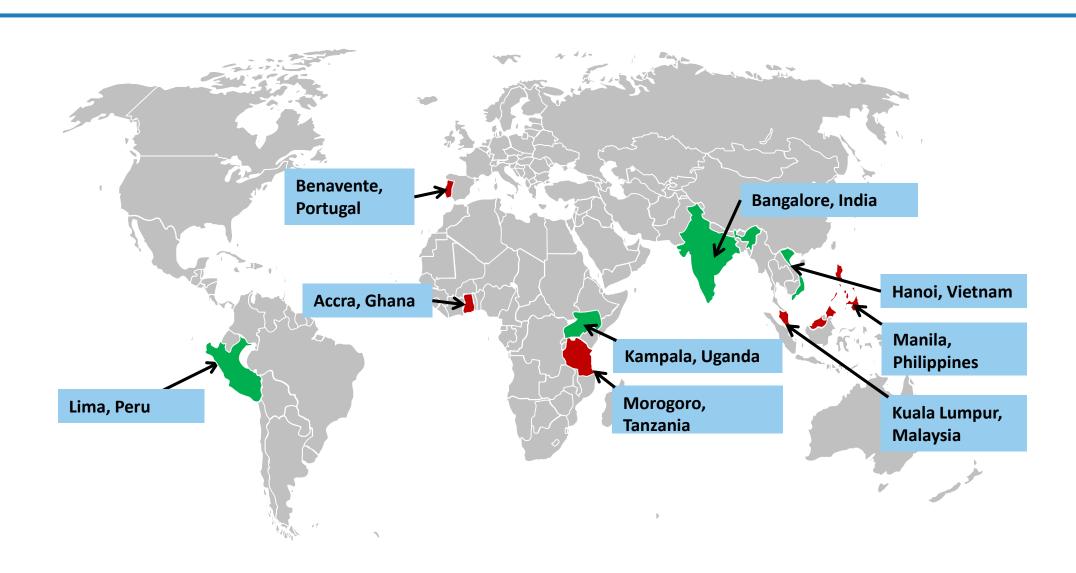


How can health protection be incorporated in RRR businesses?





SSP trial sites





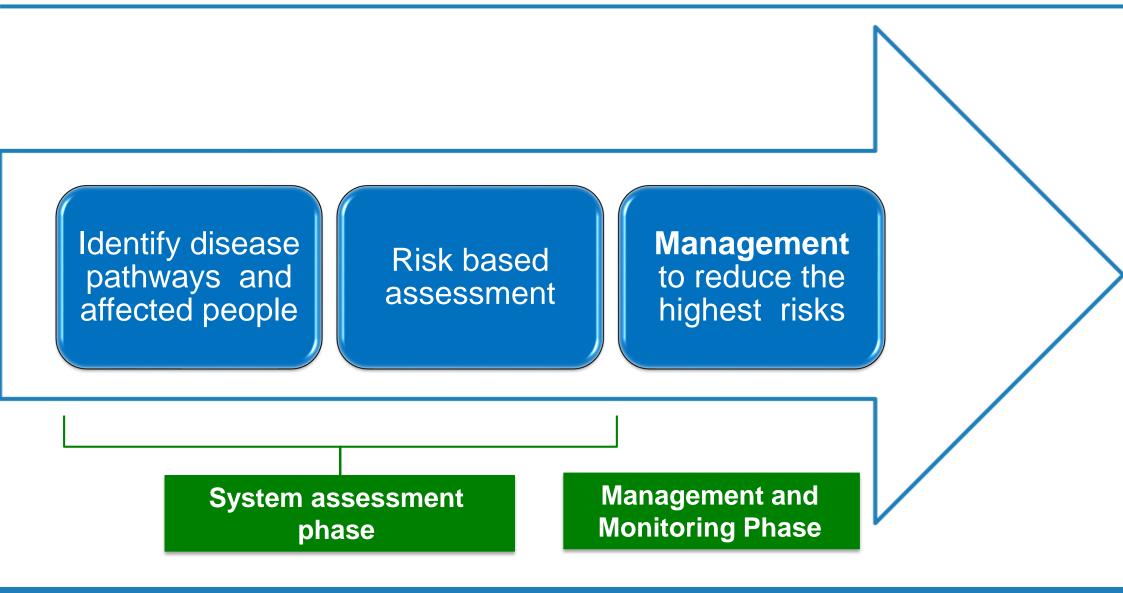
SSPs are a management tool to:



Relevant for Business Models but also Public Health Programmes

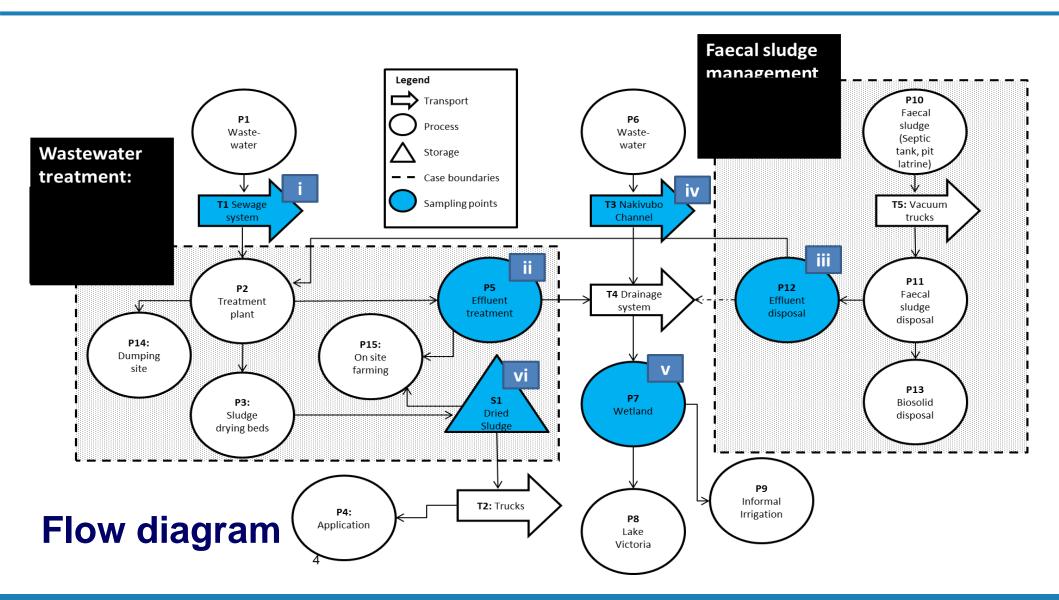


How do SSPs work?





SSP outputs: What is the system?





SSP outputs: Who's is at risk?

Table 1	Table 1 – Exposure groups of the WWTP						
Exposure group: WORKERS (W) number							
No.	Exposure sub-group	individuals					
W1	Worker who operate the plant	25					
W2	Worker who are located in the office or labs	25					
W3	Worker who clean the sewage system	30					
W4	Worker who collect and transport the faecal sludge 100-200						
W5	Worker who buy and transport the dried sludge	Worker who buy and transport the dried sludge 100-200					
Exposu	Exposure group: Farmers (F) number of						
No.	Exposure sub-group	individuals					
F1	Farmers who work on site of the plant	40					
F2	Farmer who work downstream of the plant and	Up to 1000					
	occupy the wetland						
F3	Farmers who use the dried sludge	500					
Exposu	Exposure group: Local Community (C) number of						
No.	Exposure sub-group	individuals					
C1	Community in close proximity to the plant	1000					
C2	Community exposed to effluent of the plant	5000					
C3	Community scavenging on solid wastes	50-100					
C4	Community along sewage transport routes	Above 5000					

Exposure groups



SSP outputs: How significant is the risk?

Risk Assessment

	Table 3 – risk analy	sis matrix for	rrisk ranking		SEVERITY (S)	Major		strophi			
	(R) = (L) x (S) Very high Risk High Risk 13 - Medium Risk 7	2 32 32	Insignificant	Minor impact 2	Moderate Impact 4	impact 8		16			
	Low Risk <6 Very unlik	ely 1	1 2	2 4	8	16		32 48			
Sanitation Element	Unlikely Possible	3	3	ors a	re rar	ıkin	g t	he	ontro e; R=F	l Risk level	Comments justifying risk assessment or effectivenss of the control
	Hazardous Risk	ass	sess icks	as ob	ojecti	vely	as	5	c	R	
onds)	Exposure to raw sewage in populant operation and maintenanillness	ith r eibl	isks e US	ing th	eir					М	Handwashing and washing of equipment after emptying activities is generally practiced
ibilization P										м	
P3 WWTP Operations (Waste Stabilization Ponds)	Bad odours causes unease	k m	atrix	: sev	erity a	and				M	Plant is overloaded and as a result there are high odours. Face masks are seldom worn.
erations	Improper design or overloading p quality effluent	eliho	od							VH	Plant is overloaded and effluent quality is well below standard
мть ор	Falling into ponds	pathogens	railing into	rvegrigible	workers by themselves	W3	3	16	48	VH	
P3 W	Ingestion of contaminated groundwater due to leakage from ponds in Treatment Plant	Diarrhoea	Ingestion	Site is fenced	Observation No data at present	LC3	3	16 8	32 24	н	Need to ascertain impact on surrounding groundwater

Key Output: What can be done about it?

Improvement Plans

What to do to improve the system, and when to do it – selected according to risk level



Key Output: How do we know is working?

A Monitoring Plan

- What to regularly monitor
- Who monitors it
- Where it is monitored
- When it is monitored
- How it is monitored

 What to do if monitoring shows a possible problem





Operatonal monitoring	g for WSP including Maturation Pond						
Operational Limits	Limits Operational Monitoing of the Control Measure:			Corrective action when the operational limit is exceeded			
	Control Measure: Treatment Plant (WSP) including maturation pond					
Flow: < design flow m3/day (to be determined) BOD: less than design limit (to be determined based on		Flow rate and BOD		Do additional verification monitoring to check on key performance indicators. If verifiaiton parameters are exceeded, do additional test and to determine reason for poor perfoarmance and take corrective action. Depending on levels observed, advise farmers to take additional persoanl protection measures and for additional washing of produce in clean water before leaving farm gate until the issues is resolved			
	Flow: Parshall flume BOD: sample						
pond design and detention times)	Where it is monitored	Flow: Inlet BOD, Inlet and Outlet	Who takes the action	Utility's Re-use Manager			
deterration times)							



Emerging benefits of SSPs

- Understanding risk leads to greater uptake of health protection.
- Targets resources at the highest risk areas incremental improvement.
- SSP implementation breaks down silos, stimulates national dialogue, and can lead to changes in policy and regulation.

