

IMPLEMENTATION OF THE NEW LEGISLATION FOR ON-SITE SANITATION IN FINLAND



Associate Professor

Dr. **Harri Mattila**

Principal Research
Scientist

Häme University of Applied
Sciences, HAMK

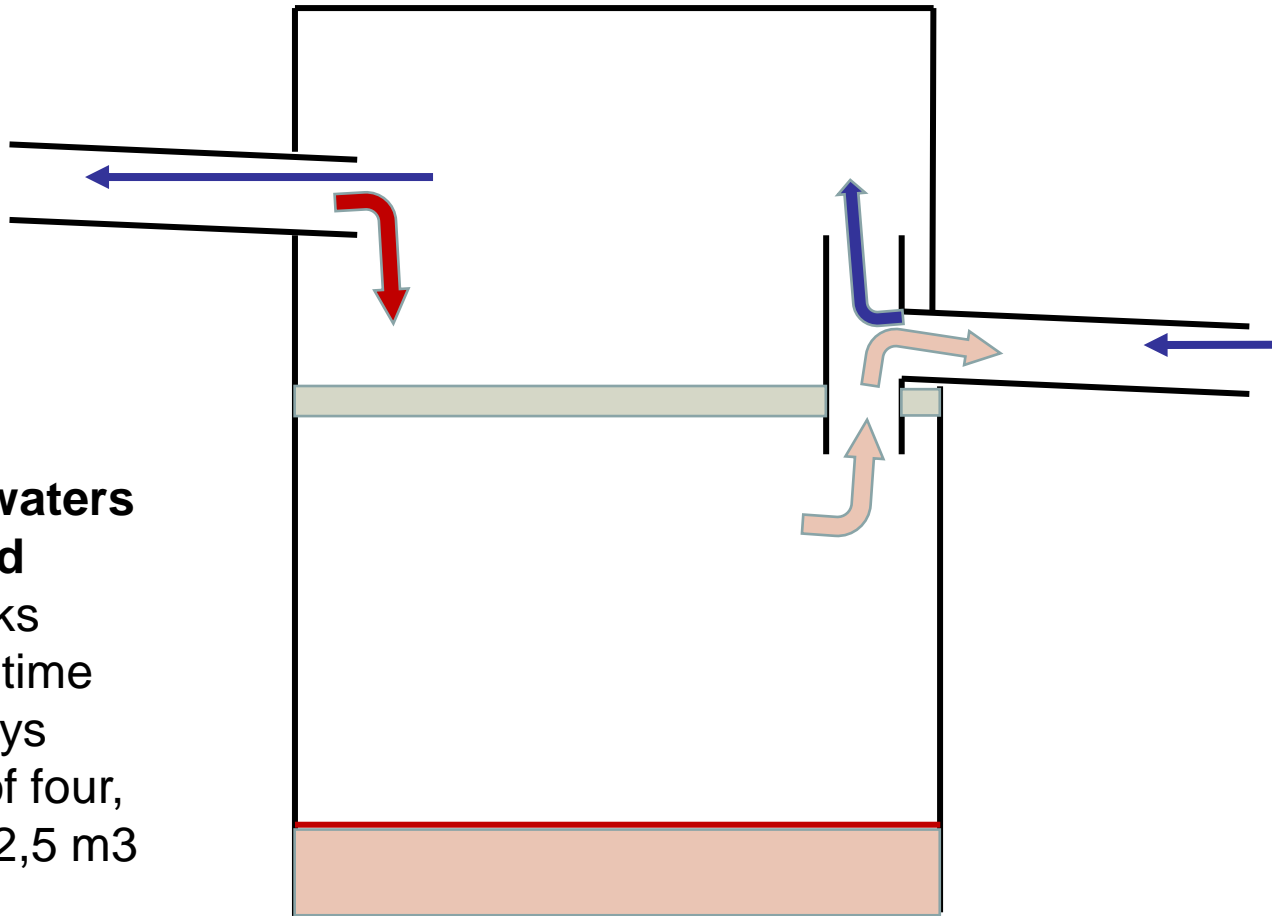
harri.mattila@hamk.fi



In the last century, septic tank treatment for wastewaters was considered to be efficient enough

**When WC-waters
are included**

- ⇒ three tanks
- ⇒ retention time
min. 2 days
- ⇒ if family of four,
capacity 2,5 m³





**PROPERLY WORKING
AND MAINTAINED
SEPTIC TANKS CAN
REMOVE A MAXIMUM
OF
70 % OF SOLID MATTER
ONLY**





**In Finland, 6/10
private wells are
not serving
properly**

**Some of them are
polluted by fecal
coliforms!**

In Finland, new legislation concerning on-site wastewater treatment (2004,....., 2017)

**Houses which
are not
connected in
sewers**



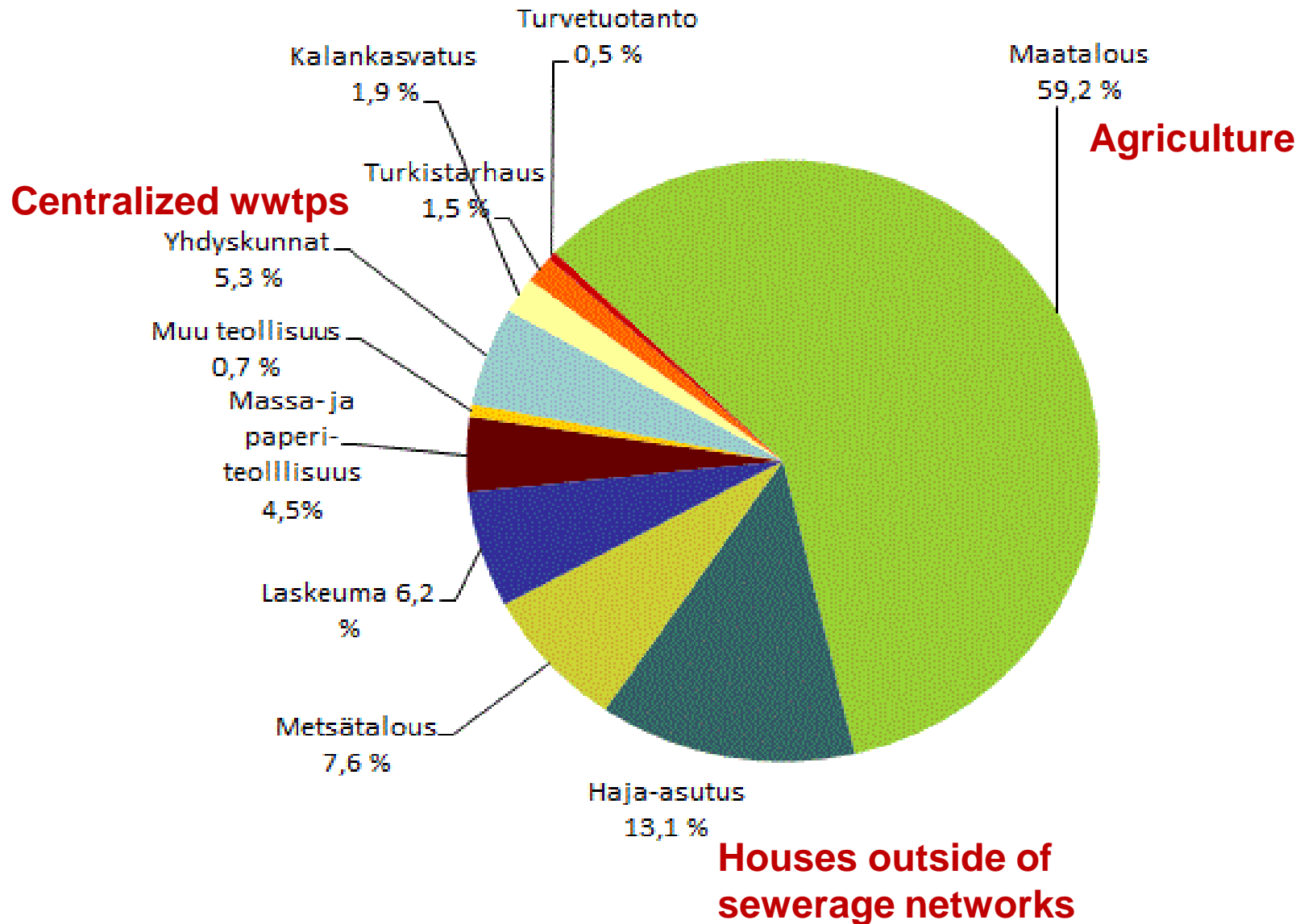


**Summer
houses**

... all premises producing wastewaters similar to household wastewater, if the activity is not requiring environmental permit ...



Phosphorous load in water courses

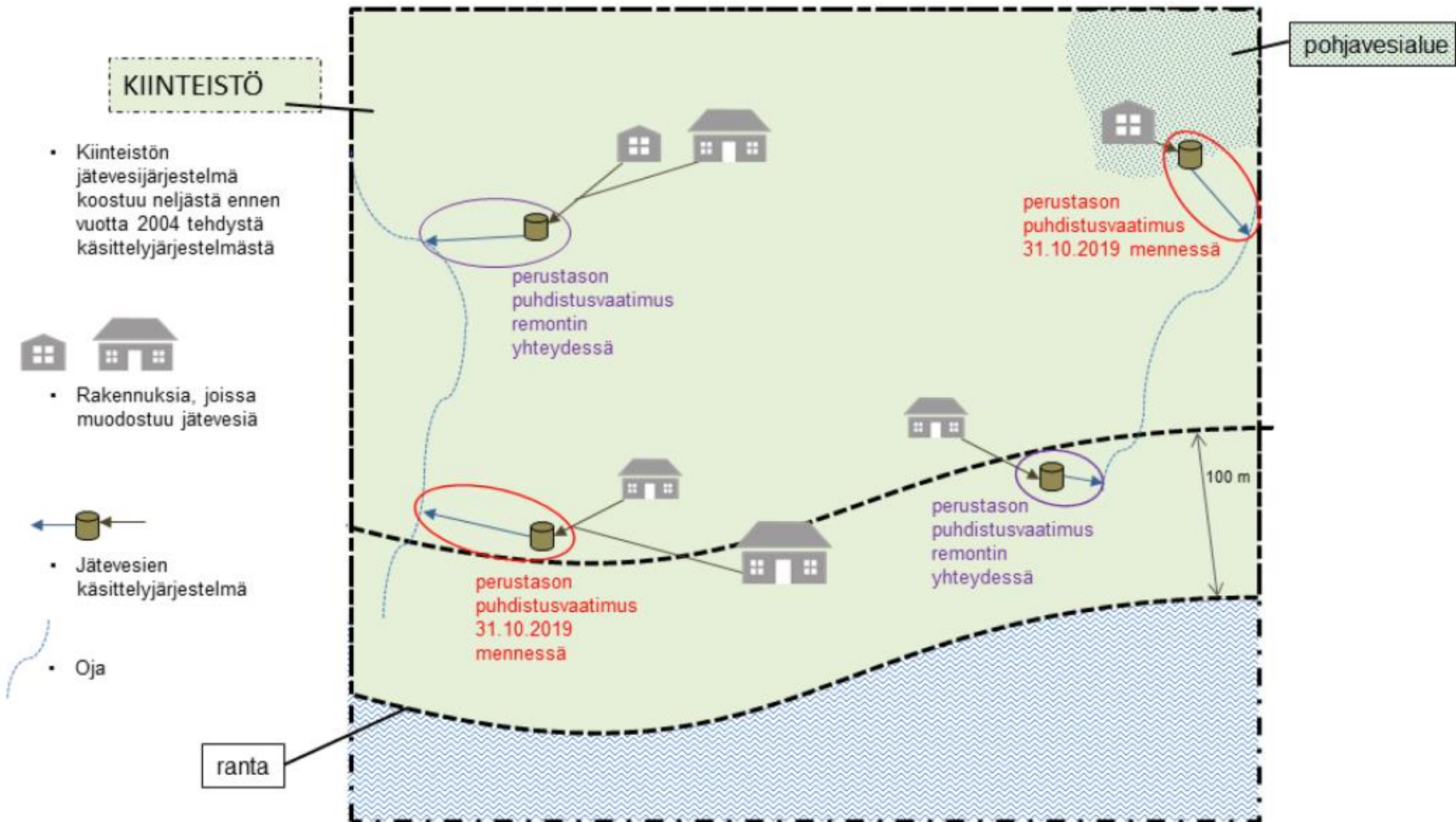


Description of the existing situation should be there already

If closer than 100 m from the shore or if on an area of ground water resources => 'dead line' 31.10.2019

Other areas: When renovations are done (no time limits)

Use the help of professionals! (note: This is the requirement by Land Use and Building Act as well.)



The Constitution of Finland

(731/1999)

Section 20 *Responsibility for the environment:*

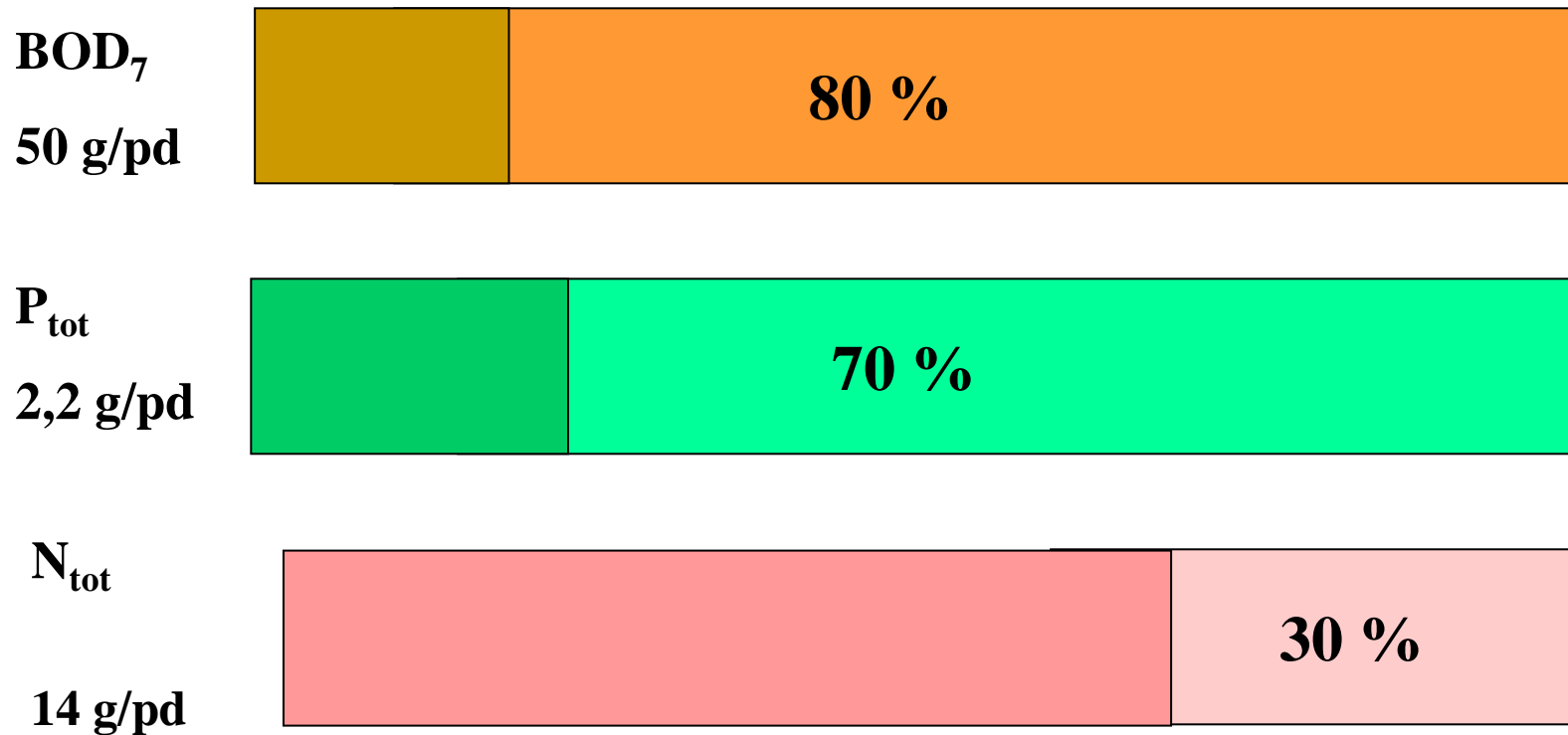
Nature and its biodiversity, the environment and the national heritage, are the responsibility of everyone.

Environmental Protection Act (86/2000)

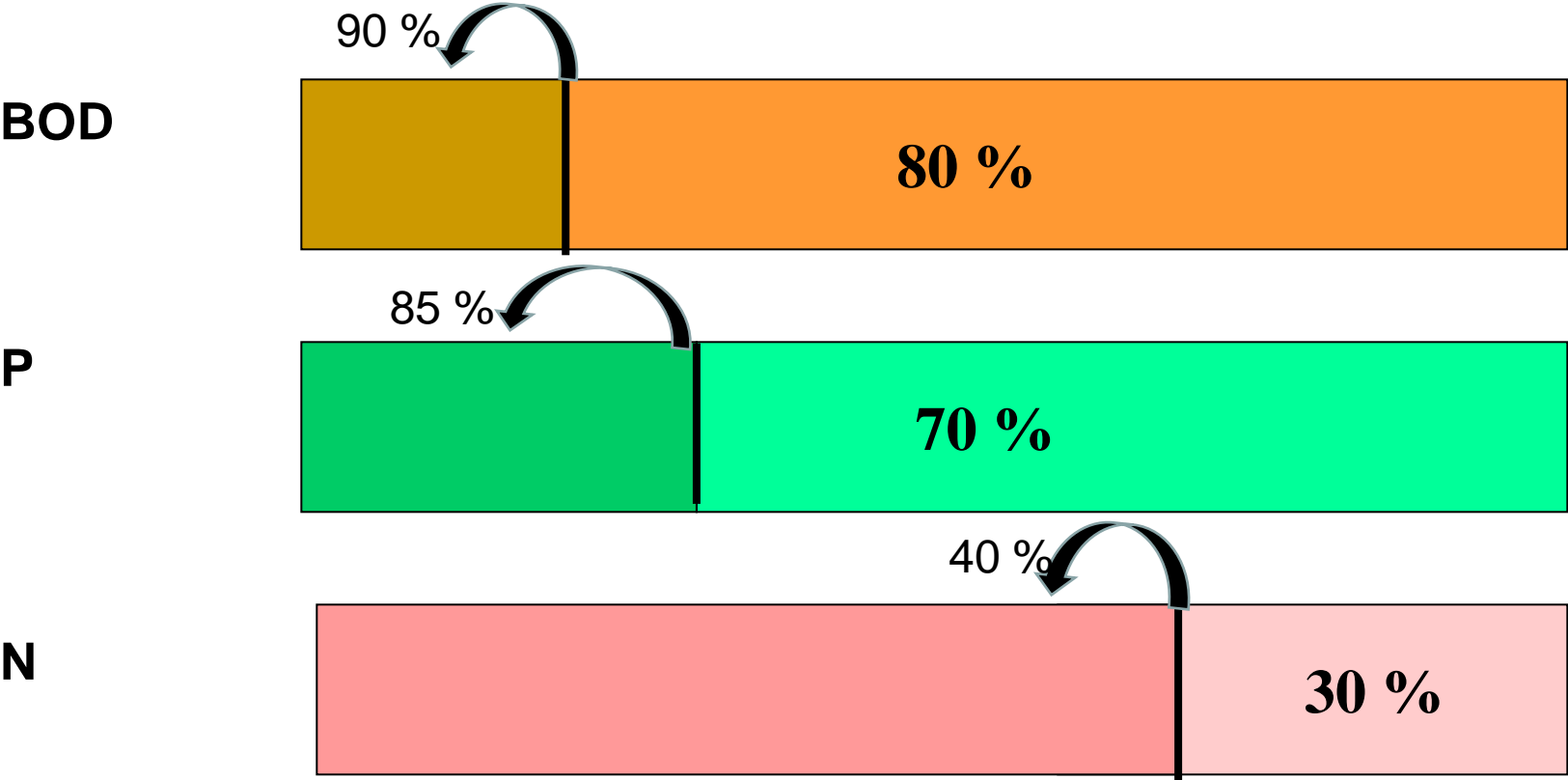
103 §:

Wastewaters in rural areas must be treated to the extent that they cannot create a danger of a negative impact on the environment.

HOUSE-SPECIFIC WASTEWATER LOAD AND WWT REQUIREMENTS



WWT requirements in sensitive areas



Waste Act (1072/1993)

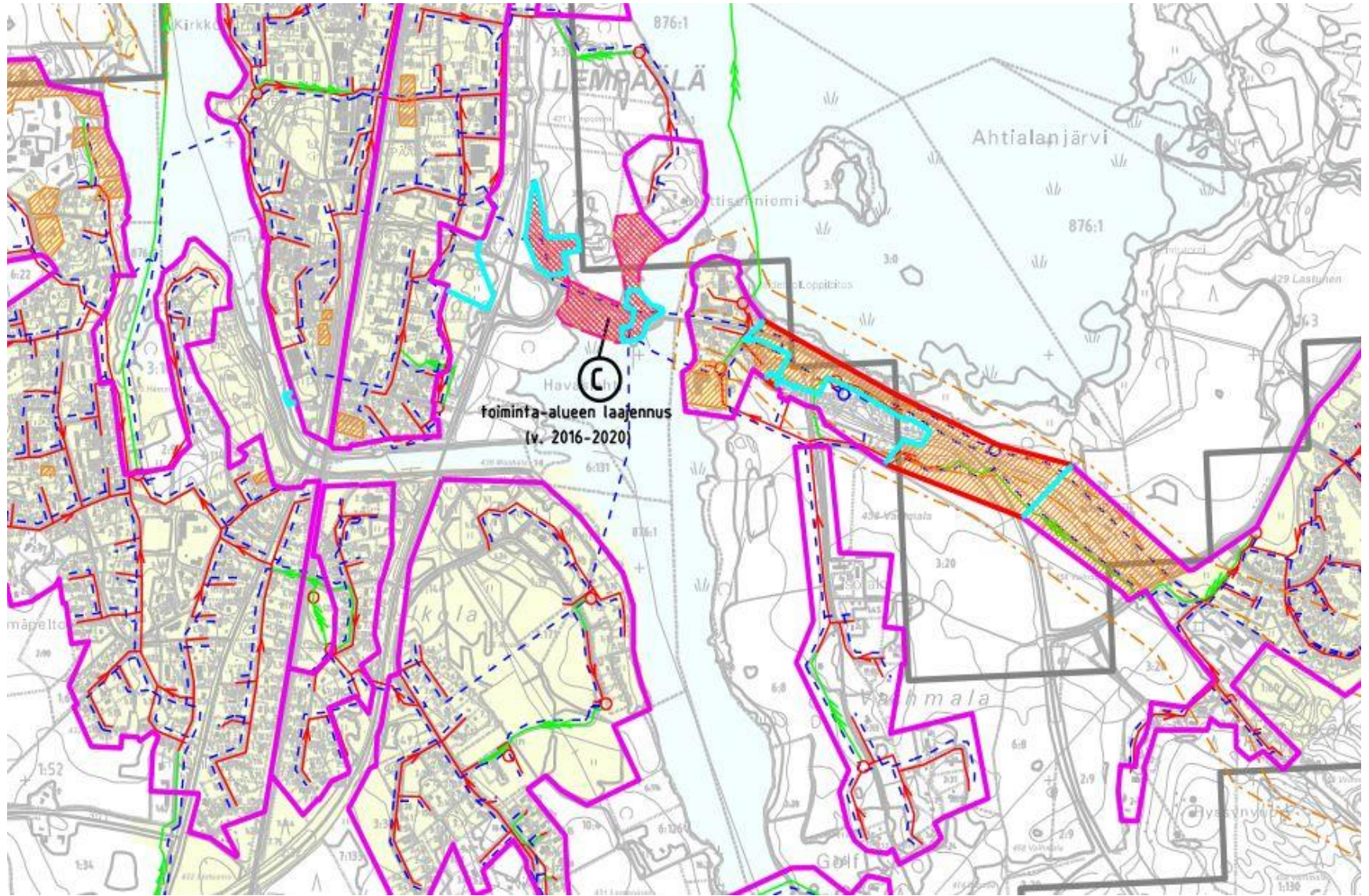


Septic tank sludge is like any other solid waste born in the household.

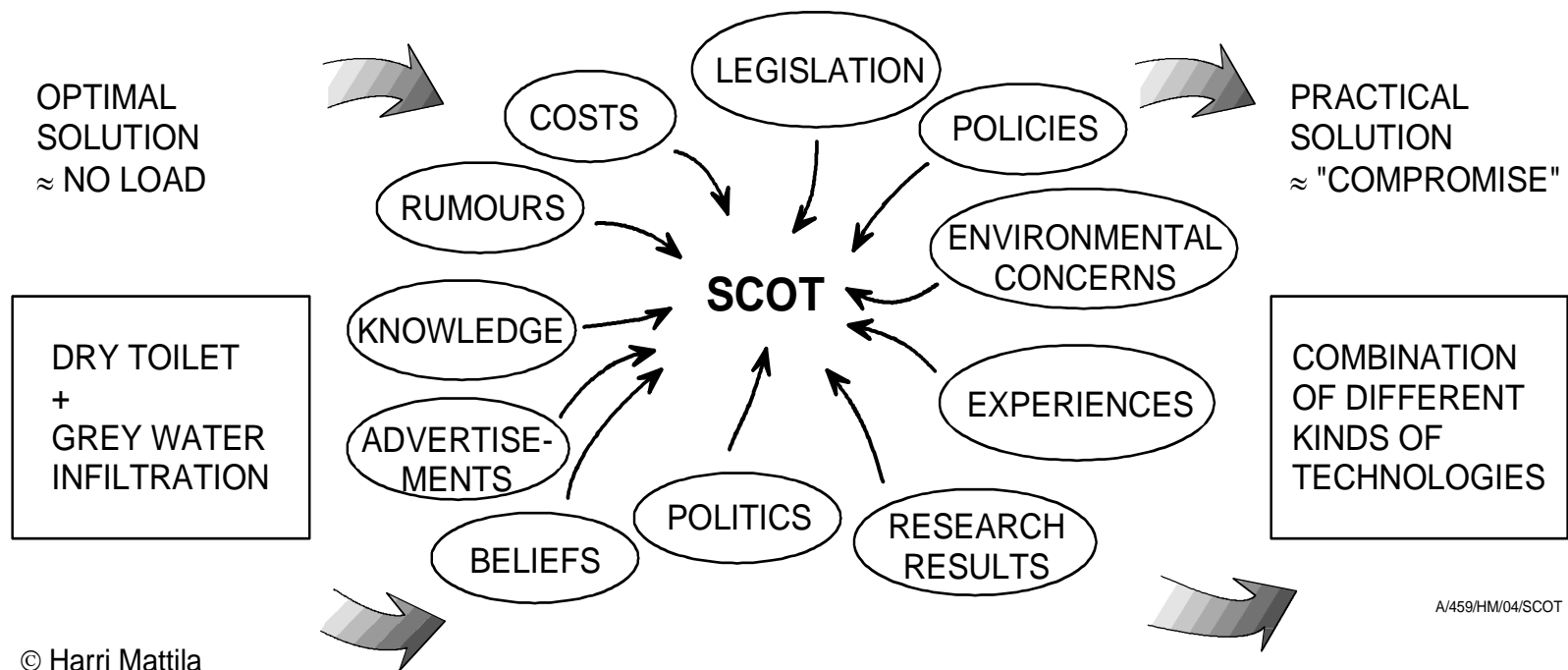
=> Only the authorized waste collector is allowed to collect it.

Act on Water Services

- Each municipality has a Development Plan for Water Services concerning the whole municipality, also the rural areas. => Property owners should know the time schedules for expansions of centralized services.
- Water services utilities are in charge of services within their operation areas
- Each house owner is responsible for water services at his/her own property.



Why the "second best" alternative is often selected?





Training !

- design engineers
 - users
 - authorities
- manufacturers
- O&M personnel
 - contractors
 - site managers
 - retailers
 - ...
 - ...

Open questions

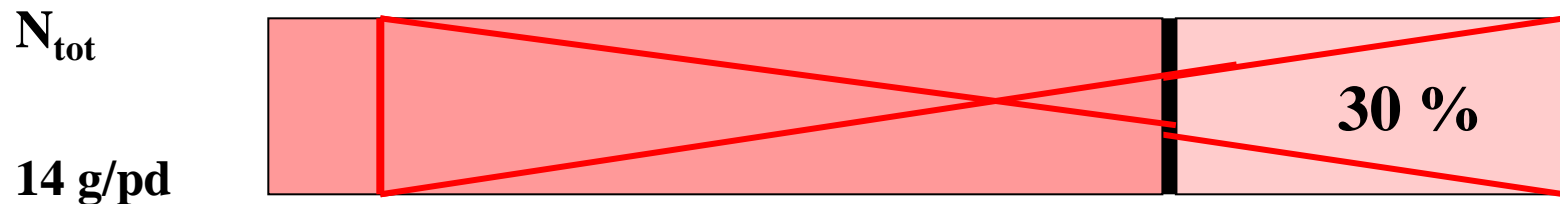
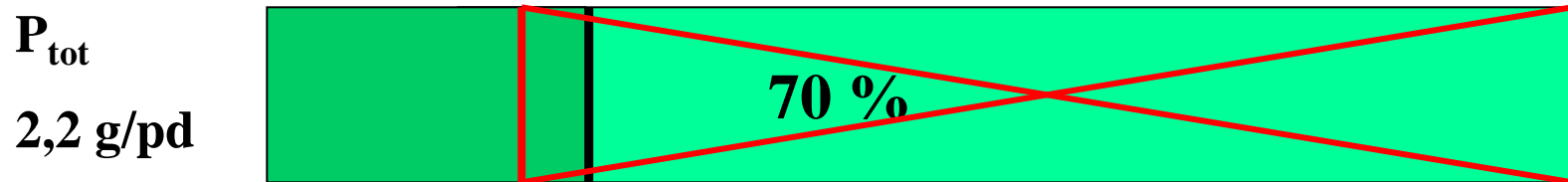
- How much is minimal amount of wastewater ?
- What to do with urine from a separating toilet ?
- Who is a qualified professional for engineering design ?
- What kind of designs of wwt are to be presented when applying a permit to build a house ?
- How to organise and control O&M activities ?

What are the components like?

origin	Organic matter BOD ₇		P (tot)		N (tot)	
	g/p/d	%	g/p/d	%	g/p/d	%
Feaces	15	30	0,6	30	1,5	10
Urine	5	10	1,2	50	11,5	80
Grey ww	30	60	0,4	20	1,0	10
All together	50	100	2,2	100	14	100

=> What is the content of wastewater to be treated ?

HOUSE-SPECIFIC WASTEWATER LOAD AND WWT REQUIREMENTS



FAECES AND URINE IN WASTEWATER

Detailed description: A red bracket with two arrows pointing to the right, indicating the portion of each pollutant that is sent to wastewater. The top arrow points to the 80% BOD₇ segment, and the bottom arrow points to the 30% N_{tot} segment.



Raini Kiukas







**Where is the
sense in
diluting
toilet waste
into clean
water?**



Option 1:
**Can you enjoy
services offerd by
the wastewater
utility?**



010

CLARK

CLARK

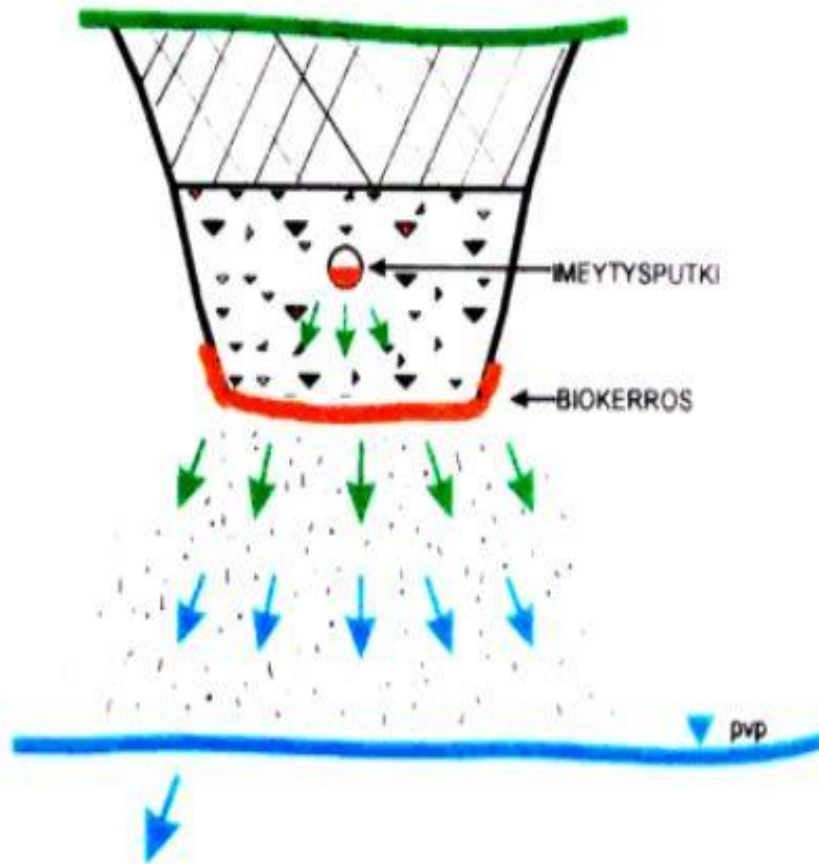
Montyraj
202
021999



Option 2:

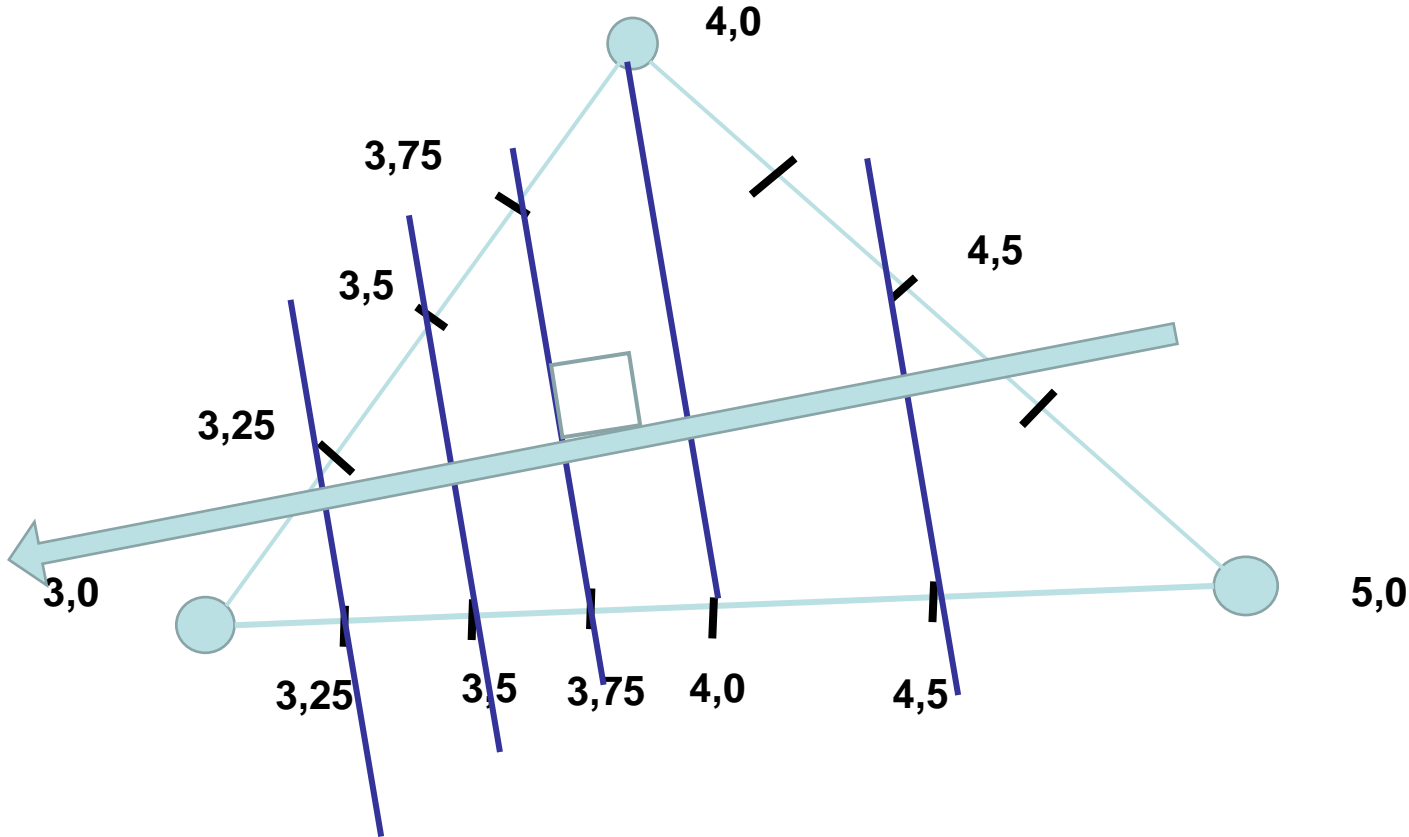
When constructing infiltration you need careful examination of the site.

- You cannot get a permit to pollute ground waters. (the one who pollutes also pays for rehabilitation)**
- Clay and tight moraine (and rock) do not take water fast enough.**



Soil infiltration

Start level 10,0 m



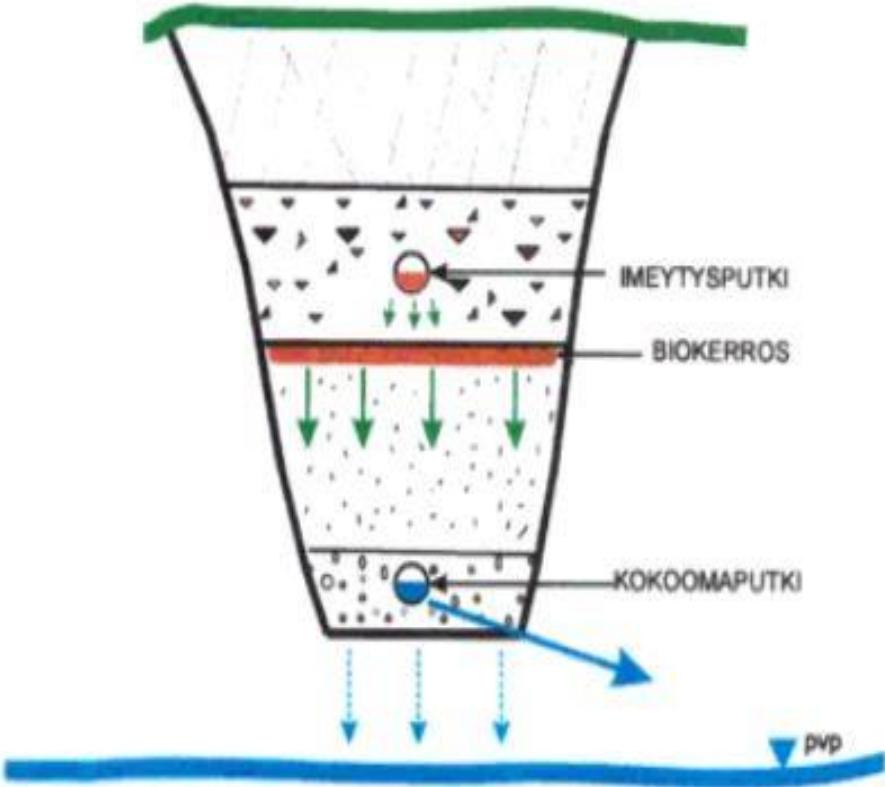
Option 3:

**Soil filters have to be designed and constructed carefully.
Septic tanks are to be maintained regularly.**

Do you need extra (chemical) treatment for P ?



Soil filtration





Option 4:

Small wastewater treatment units are easier to manage and control.

But you need some skills and interest to operate them.

Costs

- A single household 0 – 10 000 €
 - Together with the neighbour - 40 %
 - If the system is operating ~15 years, the costs / year are in the same range with all alternatives - including a connection into a centralized system (note the exceptions: the infiltration is the cheapest and the collection tank might be very expensive)
- => Be careful in desing and construction. And remember to maintain the system!**

**There is the best option (BAT, BEP)
for each and every premises.**

The system MUST be taylor-made!





**Water co-operatives
have been formed
and long networks
constructed without
proper consideration
of life cycle costs.**

Pönttökin tietää mitä varten on roskis

Vältä viemäri vahingot ja säästä
yhteisiä rahojamme.



Poissa silmistä, poissa mielestä?

Sinne on niin kätevää heittää kaikenlaista. Pönttö nielaisee vain varta pumpulipuikot, terveystiteet, sukkahousut, kondomit, kahvinporot ja tupakantumpit, ruoantähteistä puhumattakaan. Eikä kukaan edes tiedä, että olet heittänyt ne vessanpönttöön – niin kauan kunnes eräänä päivänä asuintalosi viemäriverkosto saa kyllikseen ja iskee takaisin.



Asuintalosi ja Sinun onneksi ne tulevat useimmiten meille asti. Jätevedenpuhdistamomme poimii viemäri vedestä vuosittain 1000 tonnia kiinteää jätettä, kännyköistä alushousuihin, luottokortteista tekohampaisiin. Emme me niitä voi mereenkään päästää, olemmehan tunnettuja siitä, että pidämme osaltamme Suomenlahden mahdollisimman puhtaana.



Sinä voit auttaa meitä, tehdä pienen ekoteon. Samalla varjelet asuintalosi viemäreitä tukkeutumiselta ja säästät kaikkien kaupunkilaisten rahoja.

Käytä vessanpönttöä vain siihen, mihin se on tarkoitettu. Ja heitä loput – tietysti lajiteltuna roskikseen.



**Responsibility is
the key word!**

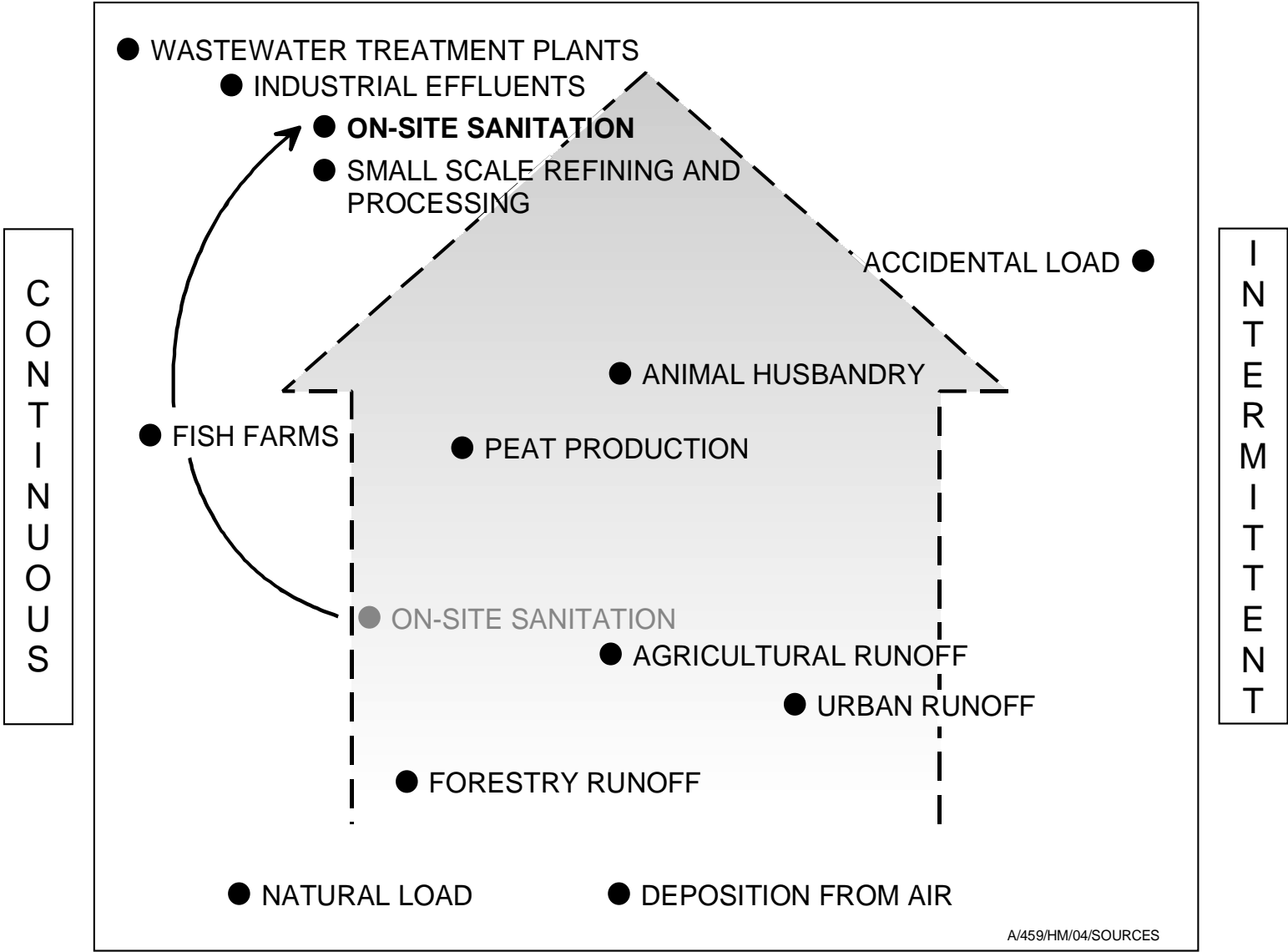
**When long pipes
are constructed the
wastewater load is
taken far away
downstream of the
water course.**

**If the load is on
your own yard, you
are more likely
taking care of it.**

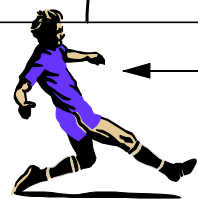
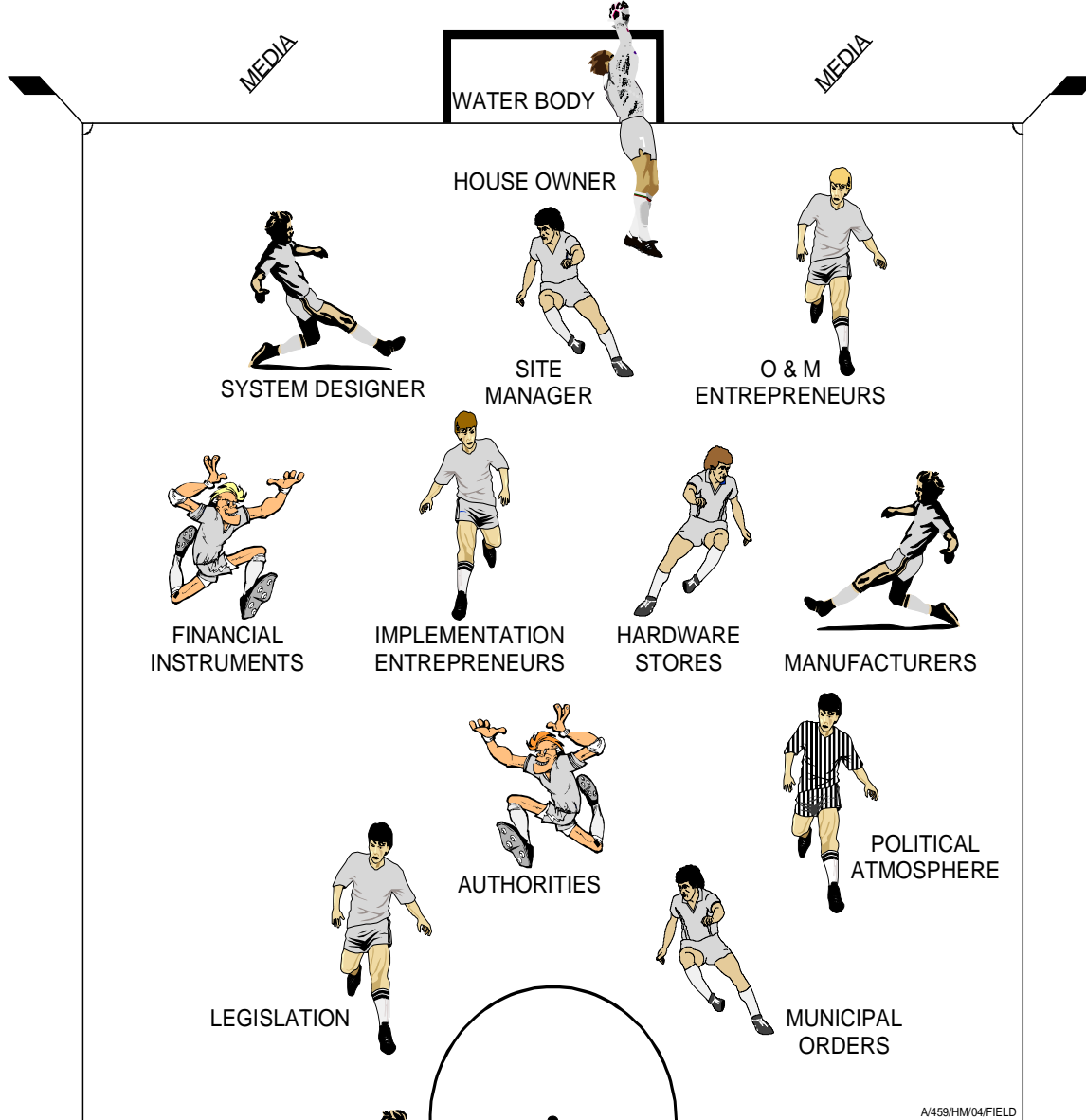


PURKU-
PUTKI

POINT SOURCES



NON-POINT SOURCES



MANAGEMENT PROCESS NEGOTIATING THE BALL THROUGH THE DEFENCE

ON-SITE SANITATION

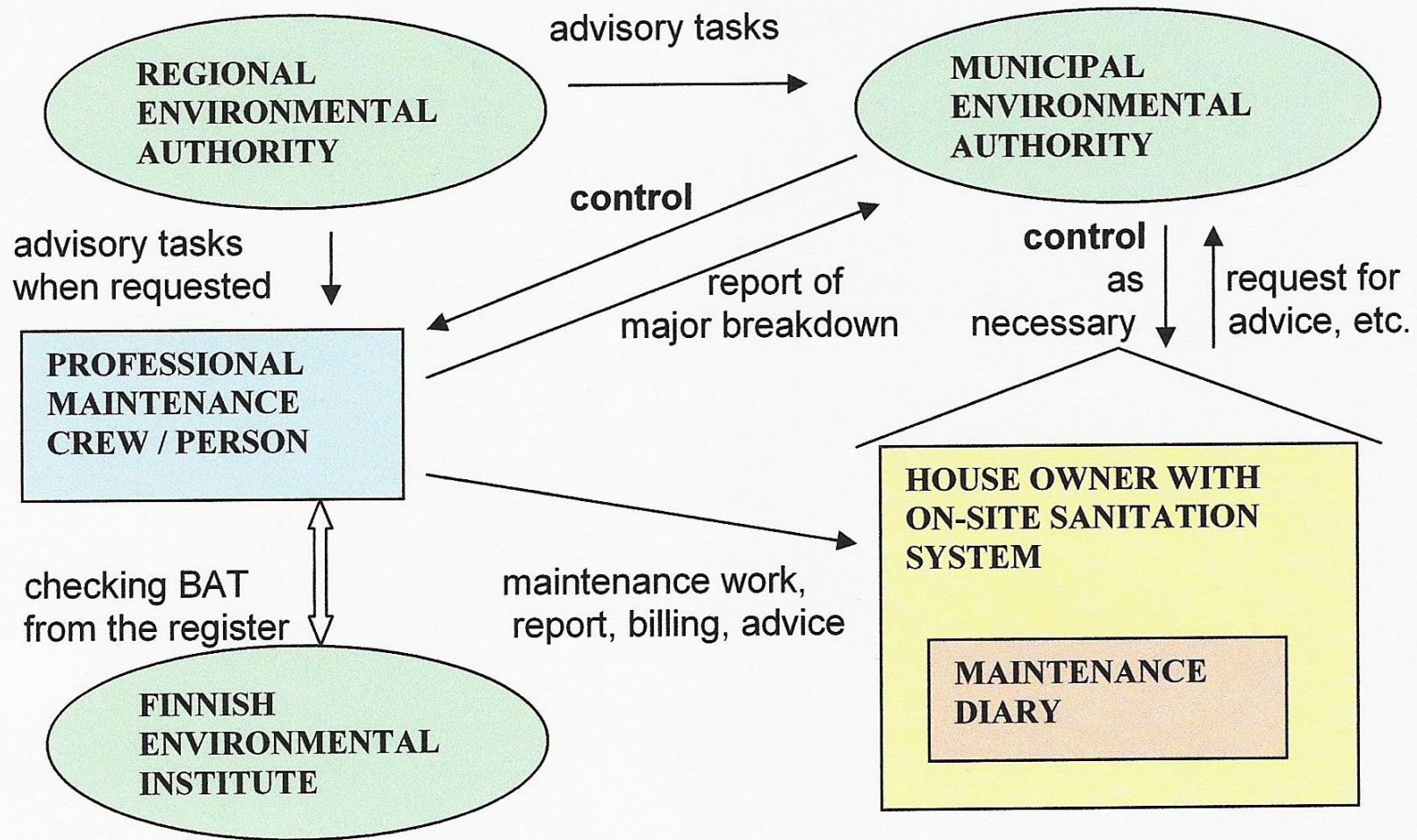
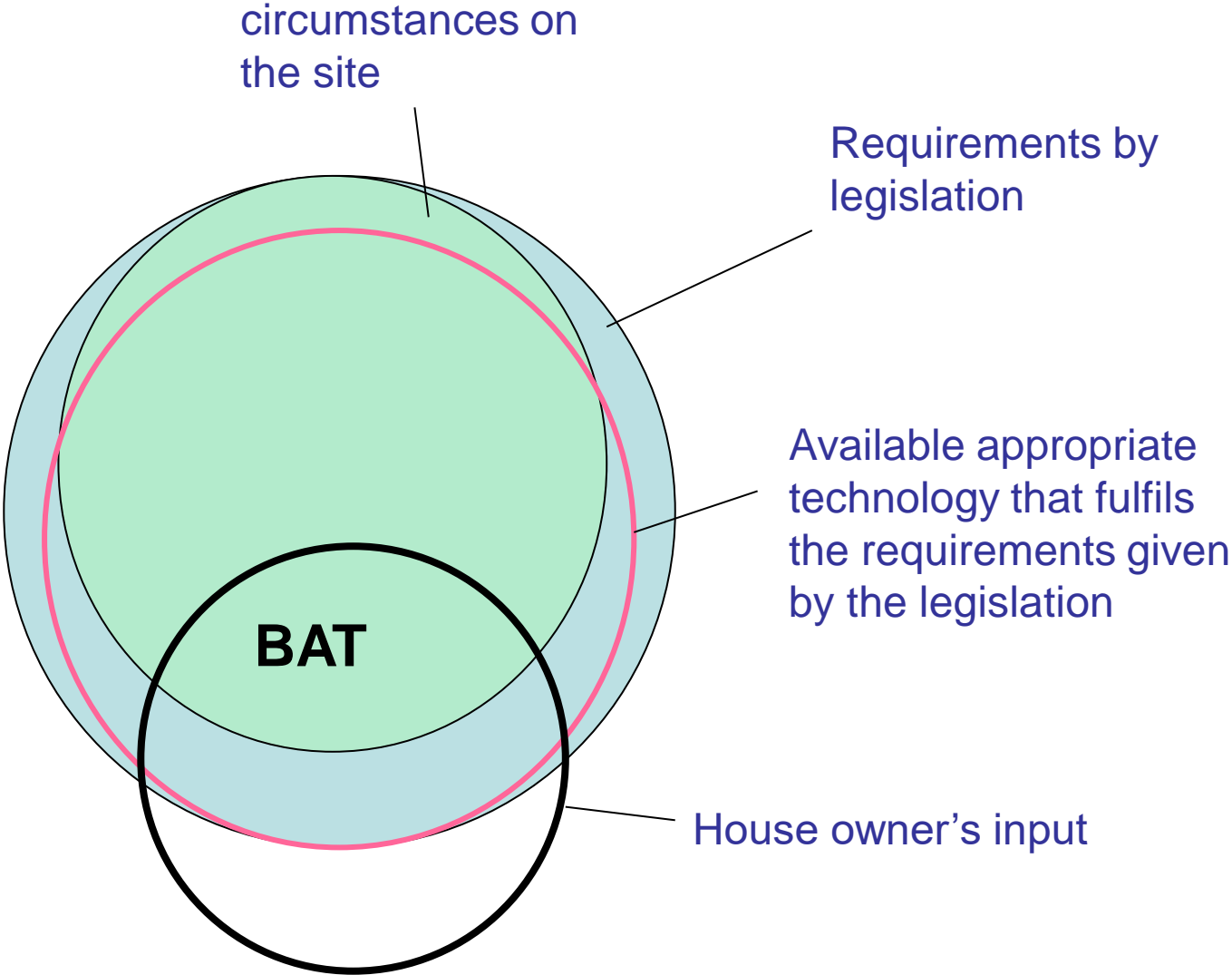
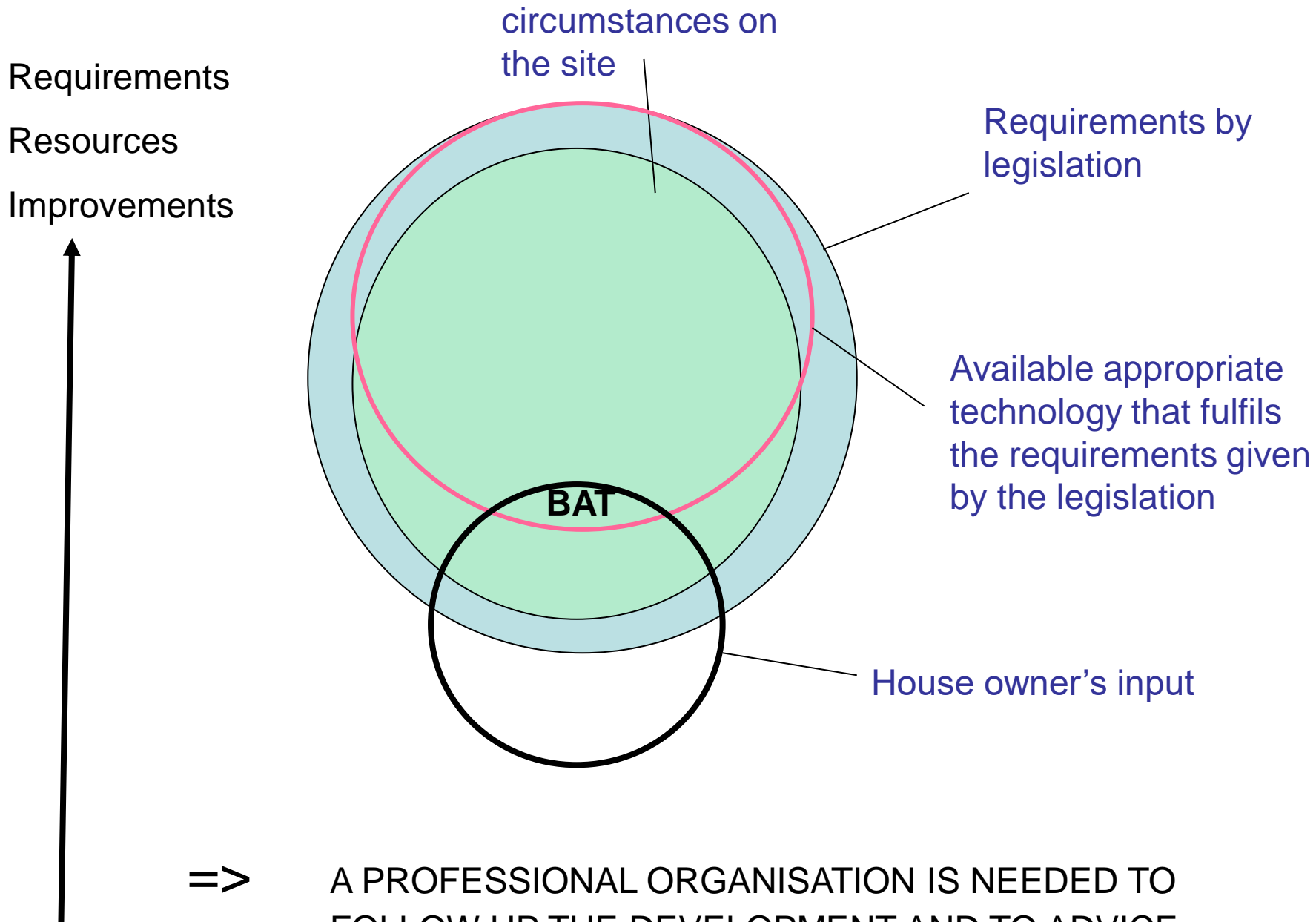


Figure 1. Proposed control system for on-site sanitation (proposal by the author)

Requirements
Resources
Improvements





⇒

A PROFESSIONAL ORGANISATION IS NEEDED TO FOLLOW UP THE DEVELOPMENT AND TO ADVISE HOUSE OWNERS

Number of professionals of on-site systems will increase.





In the long run, the new legislation will raise up the value of real estates and houses.