Student **Satria A. Permana**
1st Mentor **Luisa M. Calabrese/ Taneha K. Bacchin**
2nd Mentor **Denise Piccinini**
Graduation Board **Yung W.C.**

river *as* beings

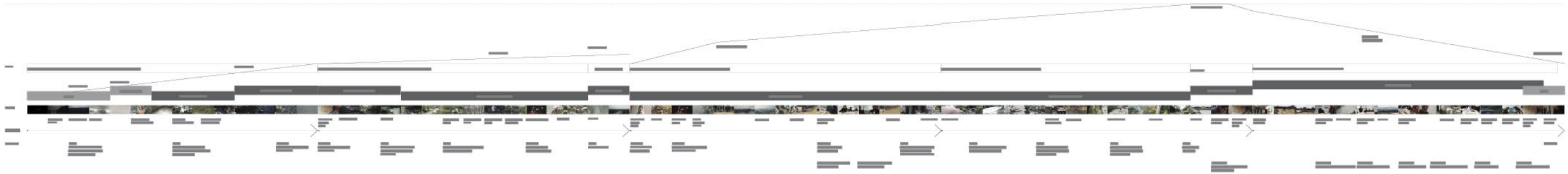
funded by

lpdp
lembaga pengelola dana pendidikan

EFL STICHTING

TU Delft Department of Urbanism
BK Bouwkunde

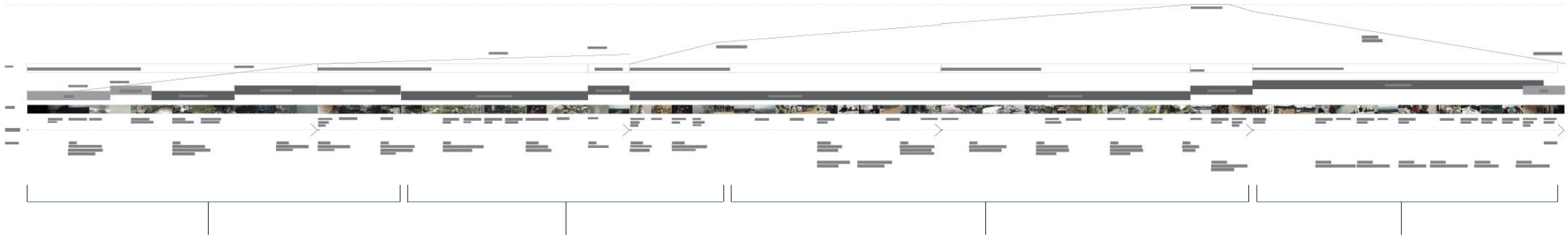
documentary – research framework – design as care – conclusions/reflections



“I am river, am I?” is a recollection of gathered river voices in Indonesia. The Anthropocene put the lifeline of our Earth, the river, in demand to restore its altered state. We do not see the river as we used before. Massive exploitation and irresponsible human actions change its life mentally and physically. Gathering all hope from our wisdom and current generations, this project seeks an absolution from the rivers.

for online attendees, in case your bandwidth is limited and will make the Zoom video stutter, you can try to stream through this QR code


I AM RIVER, I AM I?



part 01 – listening to river

rights of the river
research framework

part 02 – the new raw

altered river / altered people
semiotic analysis of river

part 03 – critical form

fine-tuning the river through systemic transects

part 04 – dialogue of care

reprojected fine-tuning
spatio-temporal assemblages

conclusion + reflections

part 01 – *listening to the river*

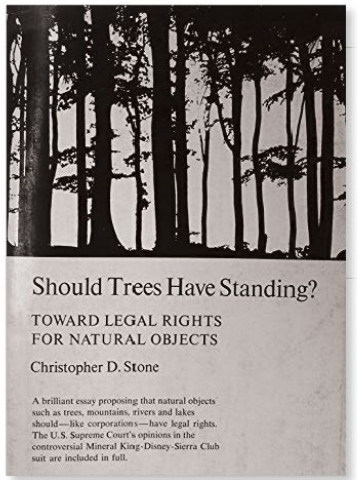
How rivers shaped the earth
(Dataset: Hydrosheds, 2023)

Burgers, L., and den Outer, J. (2021). Rights of nature. Case studies from six continents (1st ed.). Embassy of the North Sea. ↓↑

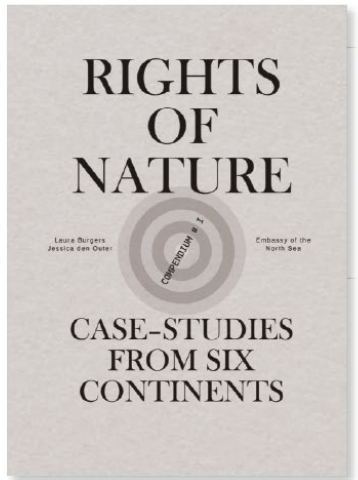
Stone, C. D. (2010). Should trees have standing? (3rd ed.). Oxford University Press. ↓↑

International River. (2020). Rights of Rivers: A global survey of the rapidly developing Rights of Nature jurisprudence pertaining to rivers. Cyrus R. Vance Center for International Justice, Earth Law Center, and International Rivers. ↓↑

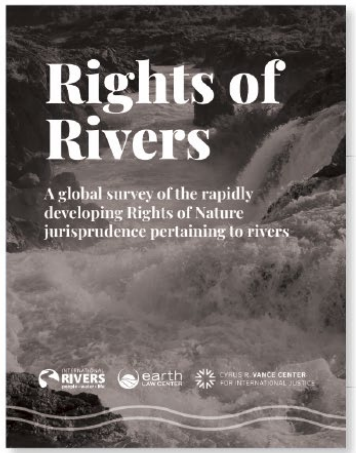
Shodikin, M.. (2023). Subjek Hukum Sungai Bengawan Solo (Urgensi dan Perluasan Subjek Hukum Internasional). Jejak Pustaka. ↓↑



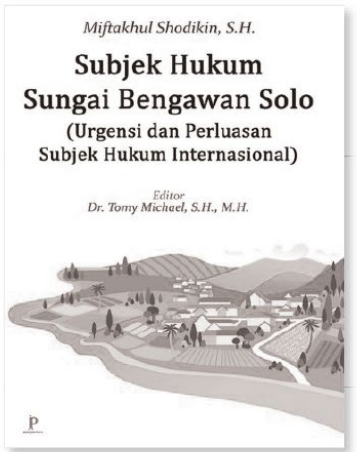
Stone, C. D. (2010). Should trees have standing? (3rd ed.). Oxford University Press. ↓↑



Burgers, L., and den Outer, J. (2021). Rights of nature. Case studies from six continents (1st ed.). Embassy of the North Sea. ↓↑



International River. (2020). Rights of Rivers: A global survey of the rapidly developing Rights of Nature jurisprudence pertaining to rivers. Cyrus R. Vance Center for International Justice, Earth Law Center, and International Rivers. ↓↑

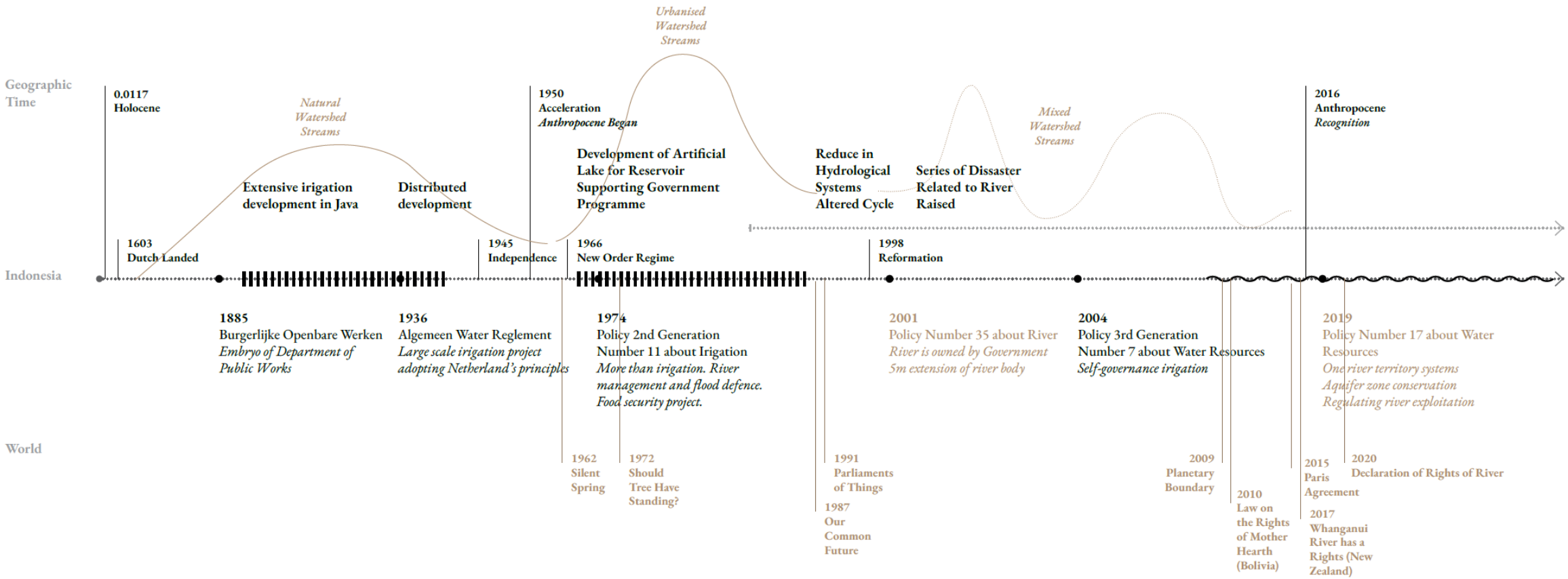


Shodikin, M.. (2023). Subjek Hukum Sungai Bengawan Solo (Urgensi dan Perluasan Subjek Hukum Internasional). Jejak Pustaka. ↓↑

Rights of rivers (International Rivers, 2020) consist of seven fundamental rights:

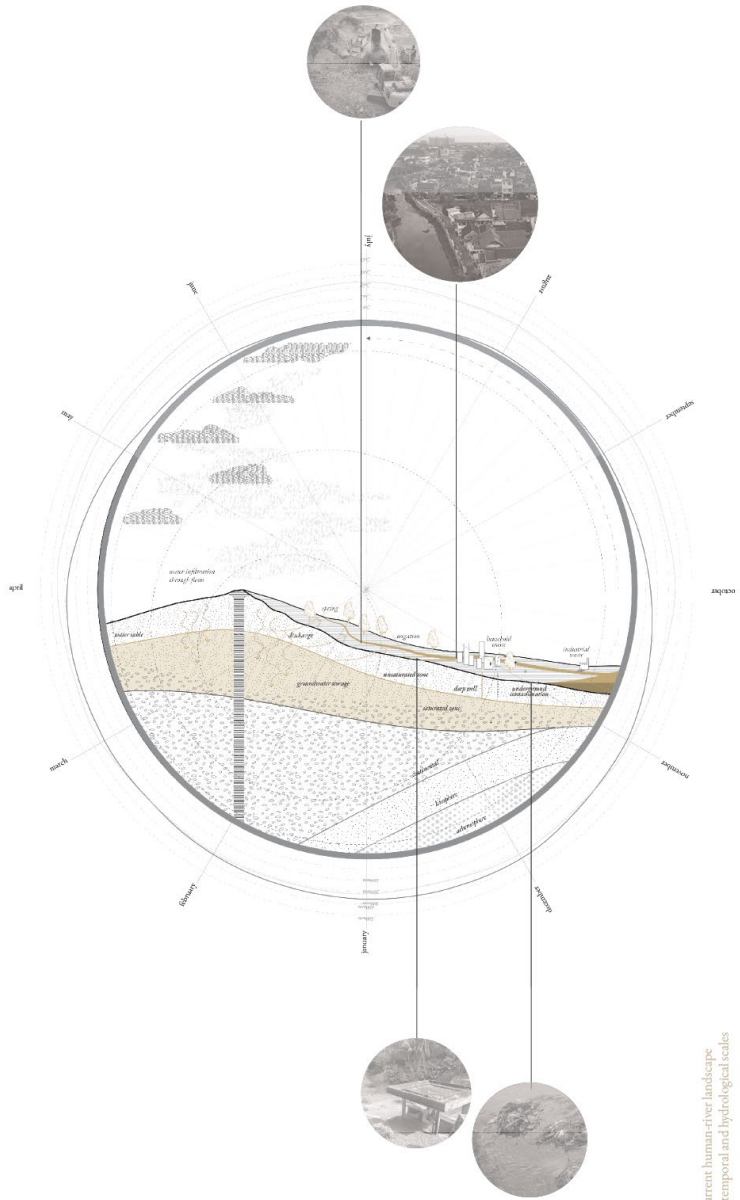
(1) The right to flow,
(2) The right perform essential functions within its ecosystem,
(3) The right to be free from pollution,
(4) The right to feed and be fed by sustainable aquifers,
(5) The right to native biodiversity,
(6) The right to regeneration and restoration, and
(7) The right to maintain lateral and longitudal connectivity.

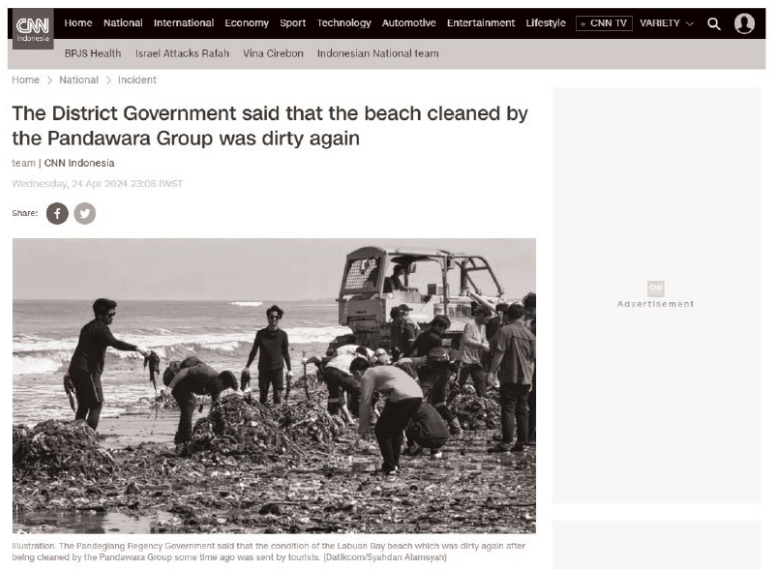
How rivers shaped the earth
(Dataset: Hydrosheds, 2023)


Geographic Time
Indonesia
World
0.0117
Holocene
1603
Dutch Landed
Natural Watershed Streams
Extensive irigation development in Java
Distributed development
1945
Independence
1950
Acceleration
Anthropocene Began
Urbanised Watershed Streams
Development of Artificial Lake for Reservoir Supporting Government Programme
1966
New Order Regime
Reduce in Hydrological Systems Altered Cycle
1998
Reformation
Series of Dissaster Related to River Raised
Mixed Watershed Streams
2016
Anthropocene
Recognition
1885
Burgerlijke Openbare Werken
Embryo of Department of Public Works
1936
Algemeen Water Reglement
Large scale irigation project adopting Netherland's principles
1974
Policy 2nd Generation Number 11 about Irigation
More than irigation. River management and flood defence. Food security project.
2001
Policy Number 35 about River
River is owned by Government
5m extension of river body
2004
Policy 3rd Generation Number 7 about Water Resources
Self-governance irigation
2019
Policy Number 17 about Water Resources
One river territory systems
Aquifer zone conservation
Regulating river exploitation
1962
Silent Spring
1972
Should Tree Have Standing?
1987
Our Common Future
1991
Parliaments of Things
2009
Planetary Boundary
2010
Law on the Rights of Mother Hearth (Bolivia)
2015
Paris Agreement
2017
Whanganui River has a Rights (New Zealand)
2020
Declaration of Rights of River


major Java's river basin territories

changes in river cycles





↑
News about the dirtiest beach cleaned by Pandawara is dumped again (Source: CNN Indonesia, 2024)

	Regulations	Key regulations	Rights of rivers alignment	Logic	Mechanisms	Calibrations
	Government Regulation No. 42 of 2008 on Water Resources Management (*Peraturan Pemerintah No. 42 Tahun 2008 tentang Pengelolaan Sumber Daya Air*)	• Integrated water resource management • Water utilisation permits • River basin management	• To flow: integrated management • To functions: sustaining ecosystems • To free: permits and monitoring • To biodiverse: - • Involvement: stakeholders coordination	• Integrated management to achieve sustainability	• Detailed guide of permits and management plans • Establish river basin management unit for coordination	• Strong integration across sectors • Challenges: ensuring consistent application of management principles
	Law No. 32 of 2009 on Environmental Protection and Management (*Undang-Undang No. 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup*)	• Pollution control • Environmental impact assessment • Rehabilitation adn restoration	• To flow: mention river flows are limited • To functions: environmental health • To free: pollution control • To biodiverse: conserving biodiversity • Involvement: community involvement	• Environmental protection and management	• Need of establish guidelines and framework for environmental impact and assessment, including pollution control	• Emphasising the assesment before project approval • Challenges: monitoring and enforcement capacity
	Government Regulation No. 38 of 2011 on River Management (*Peraturan Pemerintah No. 38 Tahun 2011 tentang Sungai*)	• River zoning • Riverbank management • Flood control	• To flow: zoning and riverbank clasification • To functions: river management • To free: river health • To biodiverse: protect ecosystems • Involvement: stakeholders involvement	• Effective managemnet and protection of rivers by zoning and floodplain	• Zoning clasification, usage guideline, and flood control management	• Challenges: balancing the needs of development with zoning and protection
	Presidential Regulation No. 12 of 2012 on River Basin Territory (*Peraturan Presiden No. 12 Tahun 2012 tentang Wilayah Sungai*)	• River basin territories • Management authorities • Coordination mechanisms	• To flow: defines basin territories • To functions: management authorities • To free: coordinated management • To biodiverse: - • Involvement: community involvement	• Define and manage river basin territories effectively by territorial delineation and management authority roles	• Define boundaries and establish its authorities to set up coordination mechanism	• Structured approach in management and clarity to its territorial boundary. • Challenges: effectiveness of inter-agency cooperation
	Law No. 17 of 2019 on Water Resources (*Undang-Undang No. 17 Tahun 2019 tentang Sumber Daya Air*)	• Water conservation • Water allocation • Water quality management • Community participation	• To flow: no mentions about natural flow regimes • To functions: water conservation • To free: water quality standard • To biodiverse:- • Involvement: community participation	• To have sustainable management and utilise water resource • Utilise legal regulations about water uses and strategies	• Implementation processes through goverment and public participations to obtain permits • Involving national-regional-local water managements	• Clear procedure about utilisation and conservation. • Challenges: effective and coordination gap

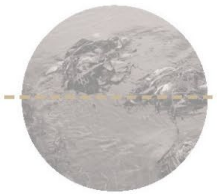
Current river landscape statement →

source

ocupation

extraction

as object



waste

channeling

collection

river body

act of taking

shift

shift

Projections →

source

ocupation

reduced/synergised

extraction

as partner

channeling

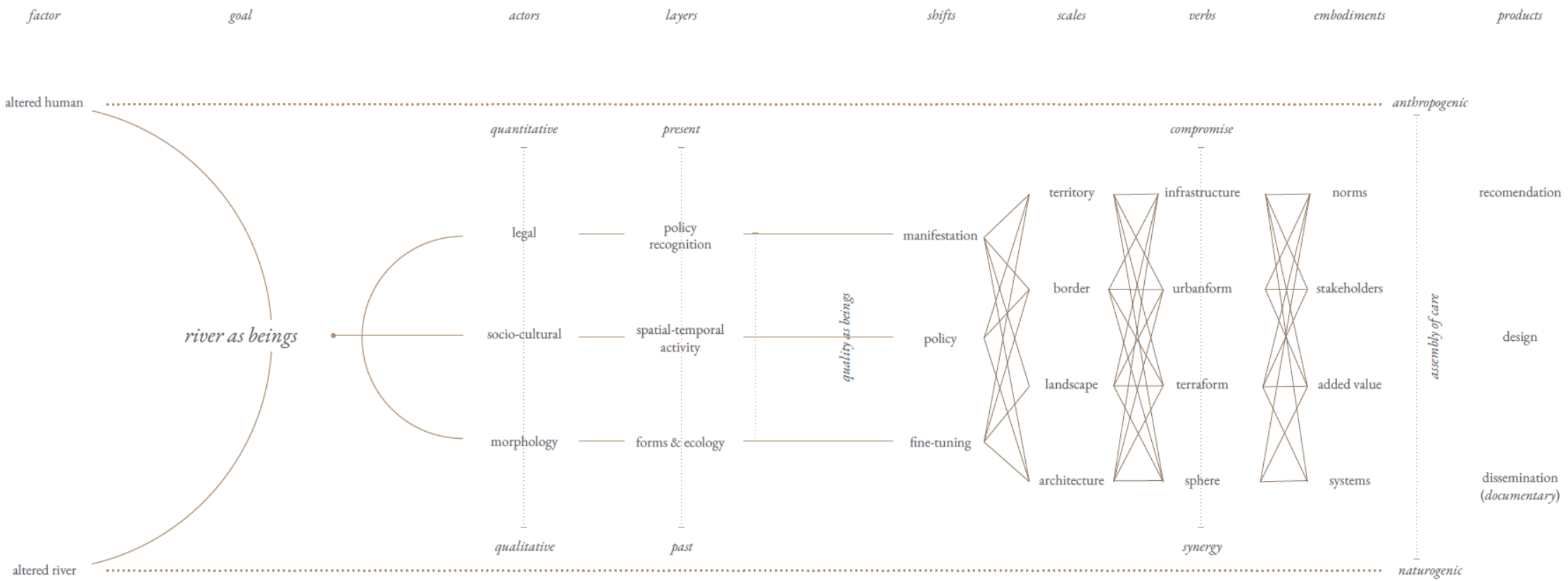
reduced/synergised

collection

act of care

river body


How can the right of nature **recontextualise the relationship** between **humans and nature** in Yogyakarta's river basin territories through spatial embodiment?


factor
goal
actors
layers
shifts
scales
verbs
embodiments
products
altered human
anthropogenic
quantitative
present
compromise
river as beings
legal
policy
recognition
socio-cultural
spatial-temporal
activity
morphology
forms & ecology
quality as beings
manifestation
policy
fine-tuning
territory
border
landscape
architecture
infrastructure
urbanform
terraform
sphere
norms
stakeholders
added value
systems
assembly of care
recomendation
design
dissemination
(documentary)
qualitative
past
synergy
altered river
naturogenic

part 02 – *the new raw*

what is river?

Climax transition ambience

Violations of Rights

Absolutions

Absolutions

Transition to Absolution

Scene 04 - Problems in Rivers

Ciliwung river

Series of sick river

Series of sick river

Archives from Gregorius Jasson

Massive impacts

Massive alterations

No more river

Walled river

Workshop archive projections

Interview with indigenous practice

Workshop by Wiwi Tjiook

Workshop archive projections

Urbanised river

[Poem]
Am I river, stunned. Cramped my body while 'you' sat, and inside the window with warm-lit, you watched.

[Poem]
Am I river, tainted. But clarity is now hidden under the blight.

[Poem]
Am I river, bodyless. As your cold concrete claw brought me scars, I am scared.

[Poem]
Am I river, bodyless. As your cold concrete claw brought me scars, I am scared.

[Poem]
Am I river, for 'you' today?

Habbie & Haekal: importance of governance inclusion

[Absolutions]
Firman and Ijat: importance of cultural significance

[Absolutions]
Rezzy: rationalising human actions

a theory of sign production
(Umberto Eco, 1976)

I propose to define as a sign *everything* that, on the grounds of a previously established social convention, can be taken as *something standing for something else*. In other terms I would like to accept the definition proposed by Morris (1938) according to which "something is a sign only because it is interpreted as a sign of something by some interpreter . . . . Semiotics, then, is not concerned with the study of a particular kind of objects, but with ordinary objects insofar (and only insofar) as they participate in semiosis". I suppose it is in this sense that one must take Peirce's definition of the 'standing-for' power of the sign "in some respect or capacity". The only modification that I would introduce into Morris's definition is that the interpretation by an interpreter, which would seem to characterize a sign, must be understood as the *possible* interpretation by a *possible* interpreter. But this

more. It does not demand, as part of a sign's definition, the qualities of being intentionally emitted and artificially produced.

archive is a reservoir of human expression and evolution, a precious inheritance from the past (Derrida, 1995).

choose 3-5 archives

↓

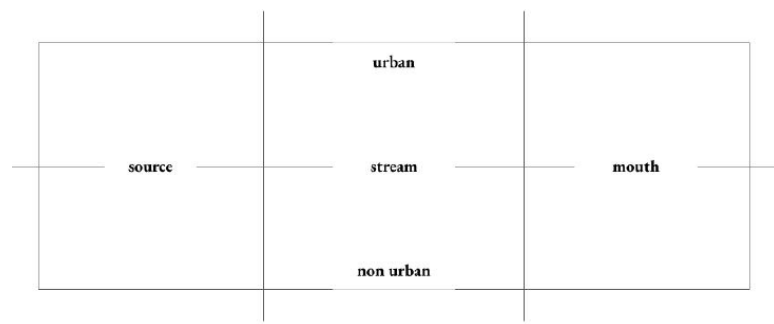
if you are the photographer of the archives, write short reason why you took that picture?

↓

what values learned from the archives should we bring to our future rivers based on your expertise (medical, policy, architecture, engineering, geography, etc)?

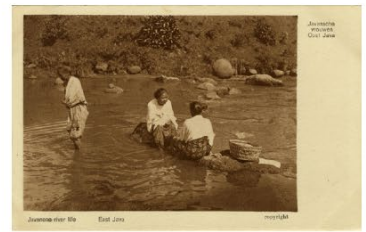
↓

framing the pieces



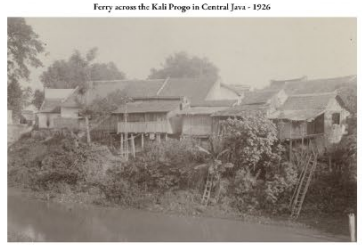
Ferry across the Kali Progo in Central Java - 1926

Kali Progo, Magelang, 1910



Javanese women. East Java. Javanese river life. East Java. - 1910

Kali Ello bij Magelang. 1931



Houses on the Tjilliwoeng in Meester Cornelis in Batavia - 1895

Kali Besar Batavia. 1900

Karel Toet (3rd from left) and Antje Toet-Miedema swimming, probably in West Java - 1935

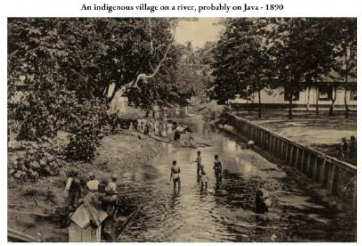
De kali Betoto, nabij Loemadjang. 1925

An indigenous village on a river, probably on Java - 1890

Boys look for snails and shellfish in a river in Java - 1935

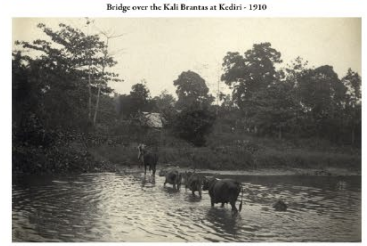
Bridge over the Kali Brantas at Kediri - 1910

Women do laundry in a river from a bamboo raft in Java - 1935

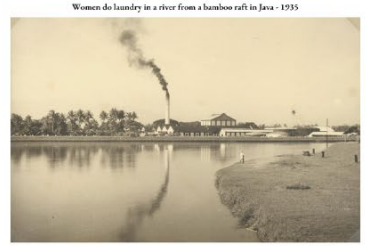


Batavia-Java. Life along the river behind Hotel des Indes. - 1910

Bridge over the kali Blongkeng, Central Java - 1920



Carabaoes wading through a river, probably on Java - 1910



Sugar factory in Java 1939

a place to play
(firman habib)

before-a place to play,
now-dump flood channel
(haekal akbar)

dirty
(rezzy yolanda)

recreational space
(regina tania)

resource
(adhisye rahmawati)

a place to play
(ahmad habbie)

common area
(alya farah)

irrigation and cultural
activity
(alfian reza)

recollections

recollections

speculative imaginations

upstream

habitat sanctuary

renaturalised dams

cultural celebration

midstream

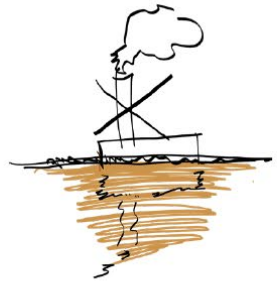
as public space

more room for river

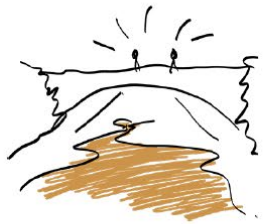
means of transport

downstream

mutualism



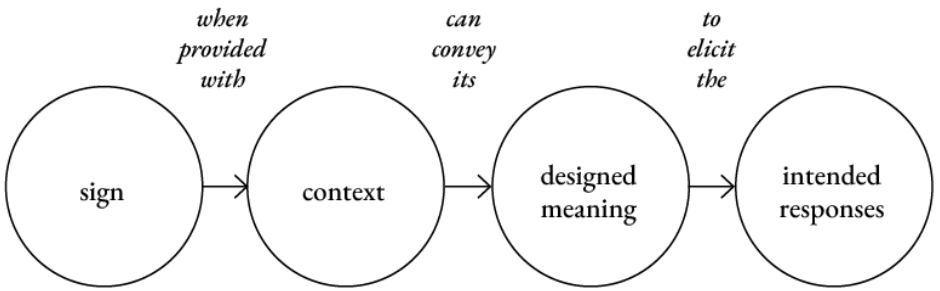
waste/industry cancels



infrastructure that highlight the river

Anatomy of altered relationship of human and river ↗

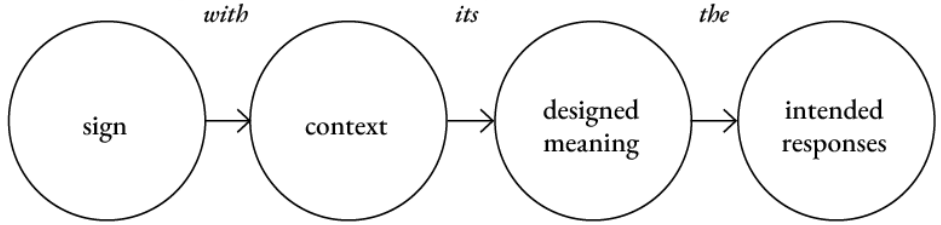
semiotics analysis



what is river?

source of water
source of floods
dump
sacred
danger
fine sand
fishing
recreation

↑ Cultural interpretations



↑ Model of semiotics theory (Source: Riera, 2020)

a place to play
(firman habib)

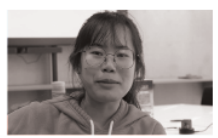
resource
(adhisye rahmawati)

before-a place to play,
now-dump flood channel
(haekal akbar)

a place to play
(ahmad habbie)

dirty
(rezzy yolanda)

common area
(alya farah)



recreational space
(regina tania)

irrigation and cultural activity
(alfian reza)

↑ River semiotic meaning from archival workshop (all participants gave their concent to this research)

restore <u>signified</u> meaning of the river

what is river?

source of water
~~*source of floods*~~
~~*dump*~~
sacred
danger
fine sand
fishing
recreation

↑ Cultural interpretations

when provided with

can convey its

to elicit the

but

sign → context → designed meaning → intended responses

but

↑ Model of semiotics theory (Source: Riera, 2020)

a place to play
(firman habib)

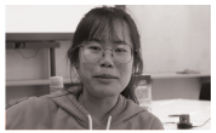
resource
(adhisye rahmawati)

before-a place to play,
~~*now dump flood channel*~~
(haekal akbar)

a place to play
(ahmad habbie)

~~*dirty*~~
(rezzy yolanda)

common area
(alya farah)



recreational space
(regina tania)

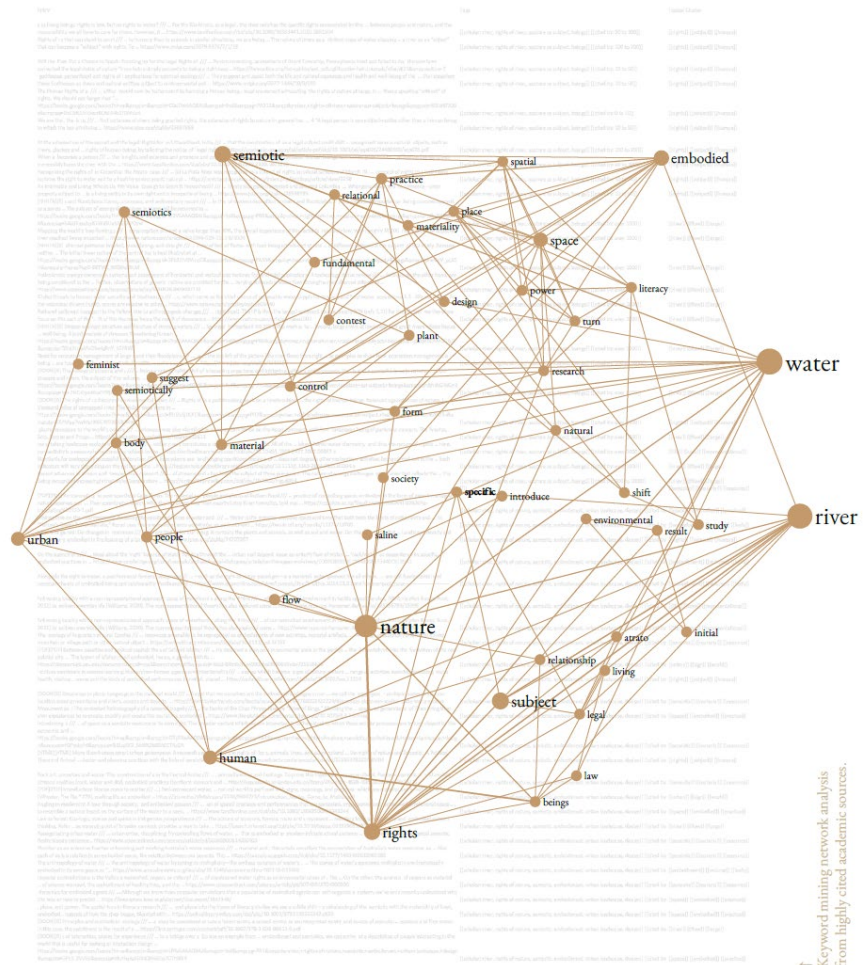
irrigation and cultural activity
(alfian reza)

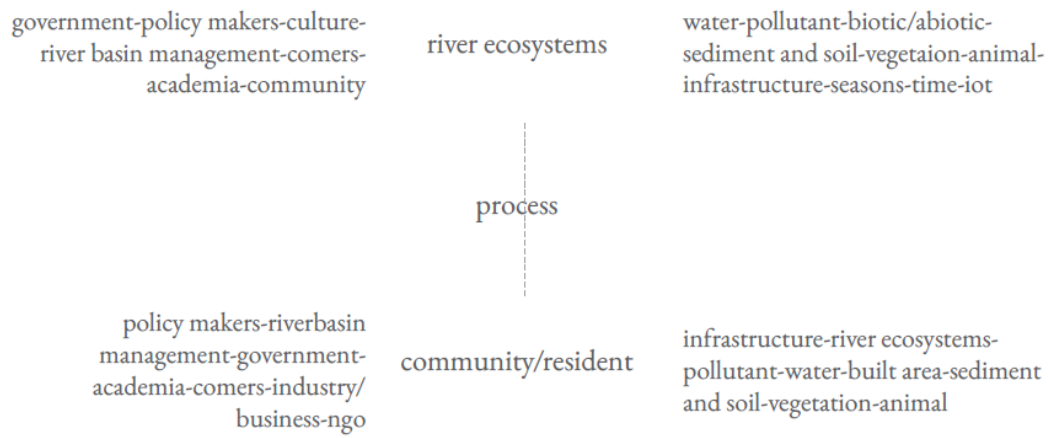
↑ River semiotic meaning from archival workshop (all participants gave their concent to this research)

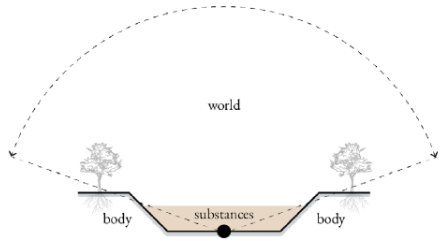
Human nervous system
source: Ramsdell and Schalck 1925
↓

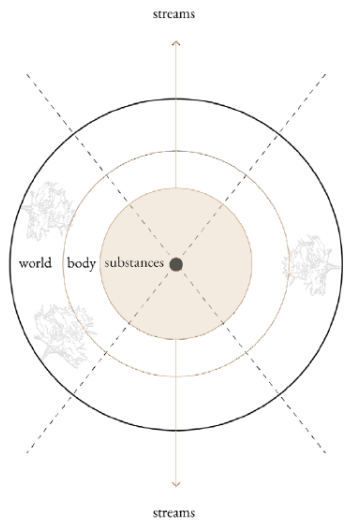
How rivers shaped the earth
(Dataset: Hydrosheds, 2023)

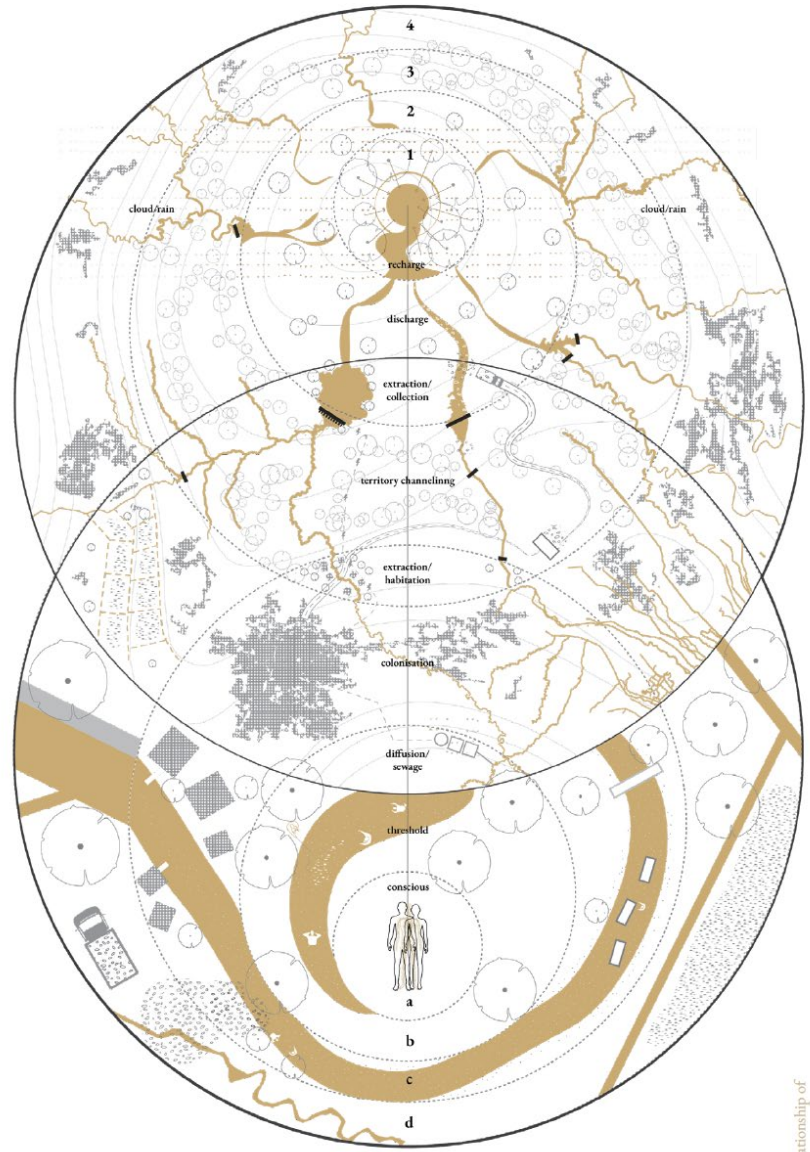
a project to care our ‘veins’


semiotic
embodied
water
river
urban
nature
rights
human
subject
spatial
practice
relational
semiotics
place
materiality
space
fundamental
power
literacy
design
contest
turn
plant
feminist
suggest
semiotically
control
research
form
natural
body
material
society
specific
introduce
shift
environmental
result
study
people
saline
flow
initial
strato
relationship
living
legal
law
beings
Keyword mining network analysis
from highly cited academic sources.


government-policy makers-culture-river basin management-comers-academia-community
river ecosystems
water-pollutant-biotic/abiotic-sediment and soil-vegetaion-animal-infrastructure-seasons-time-iot
process
policy makers-riverbasin management-government-academia-comers-industry/business-ngo
community/resident
infrastructure-river ecosystems-pollutant-water-built area-sediment and soil-vegetation-animal

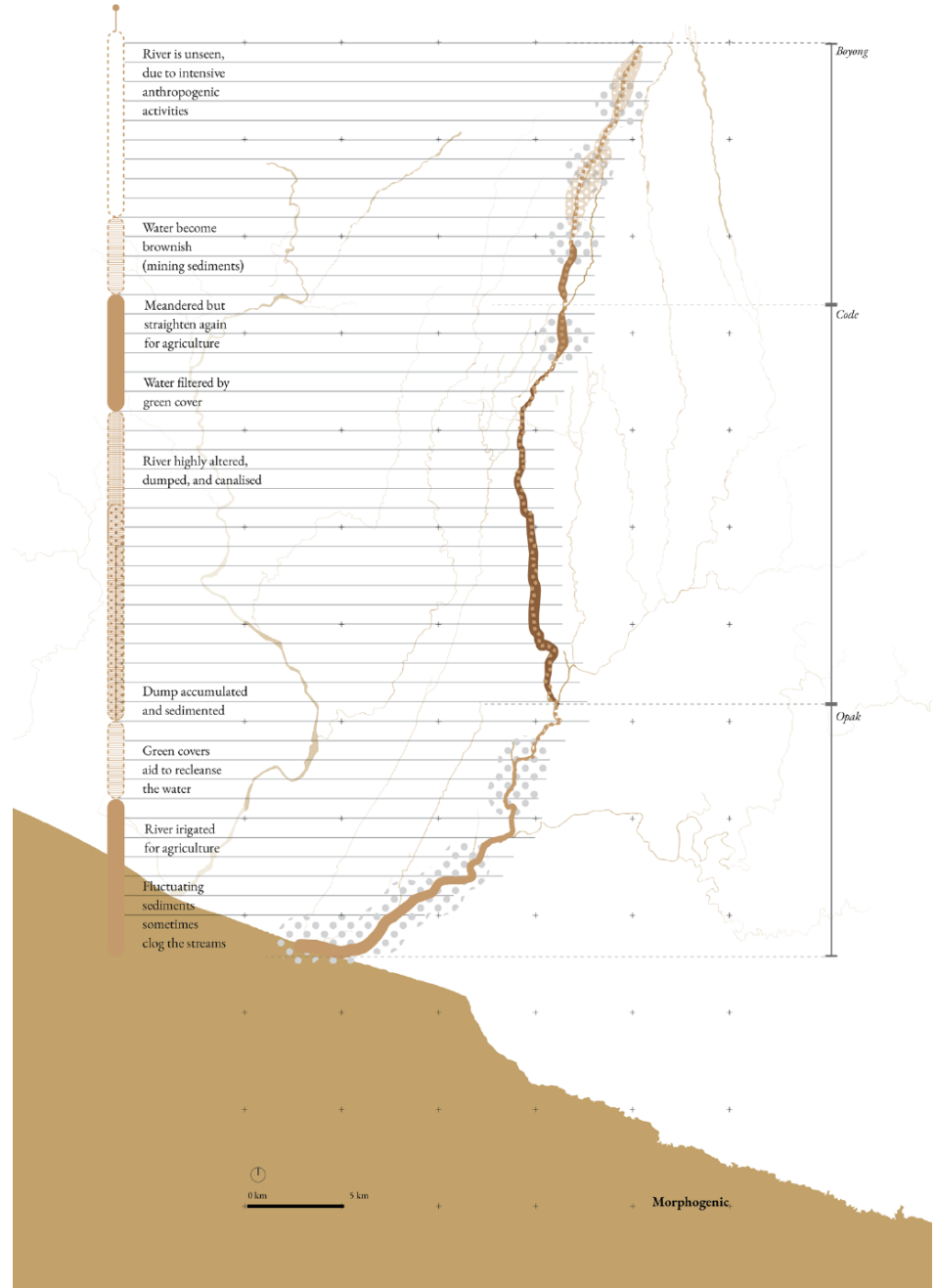






↑ Anatomy of altered relationship of human and river

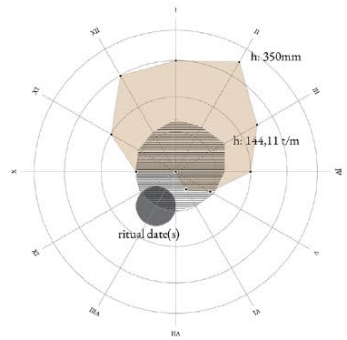
MORPHOGENIC



small river body, almost unseen
surounded by natural and anthropogenic objects
natural river streams
highly modified
modified and dumped

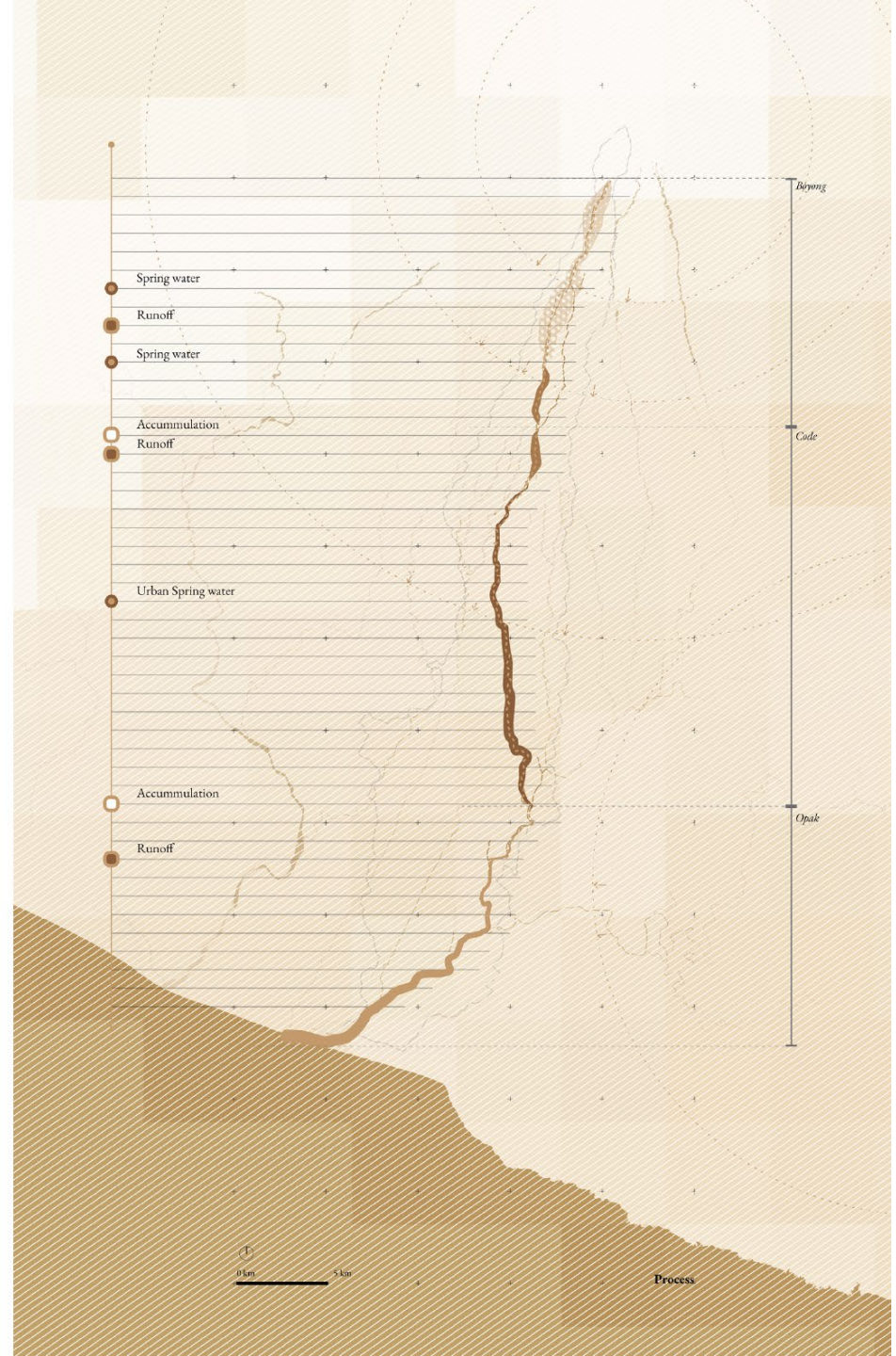
Data sources:
Geopportal Yogyakarta, 2023

PROCESS

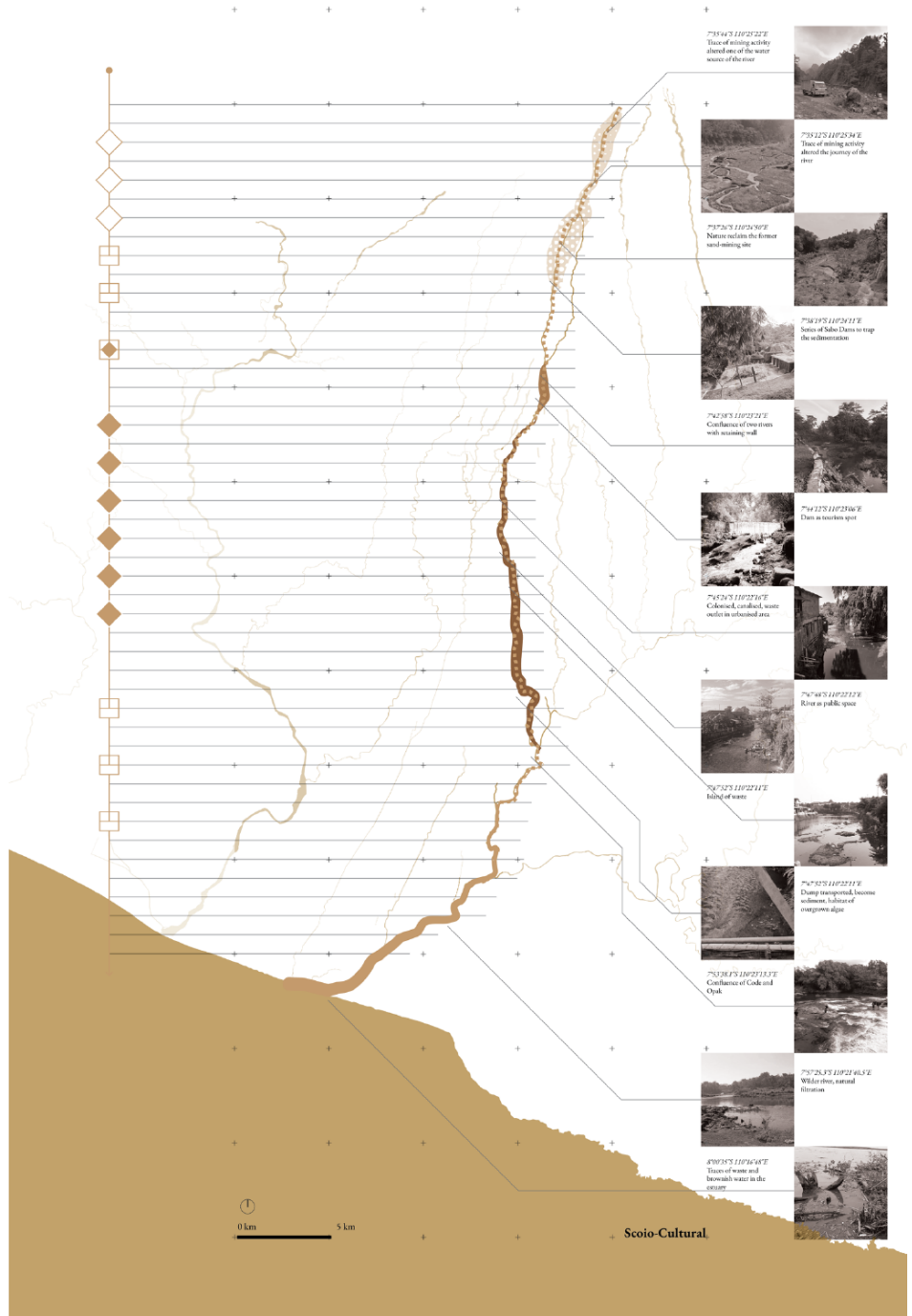


- mining
- irigation
- recreation
- urbanisation
- rain intensity

Data sources:
Annual rainfall & flow sediement average
bmkg Yogyakarta, 2022



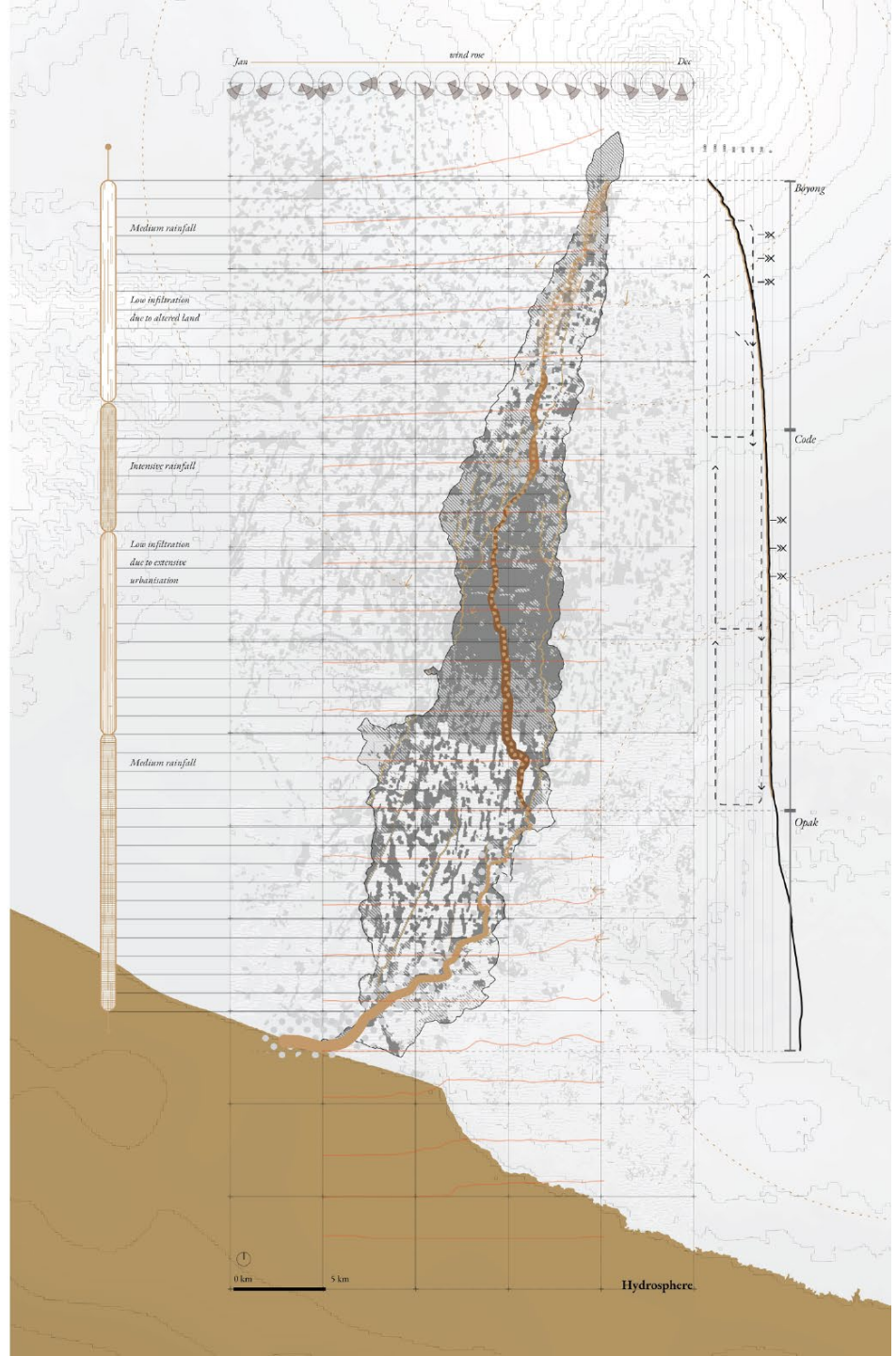
SOCIO-CULTURAL



- mining
- irrigation
- recreation
- urbanisation

Data sources:
Geopportal Yogyakarta, 2023

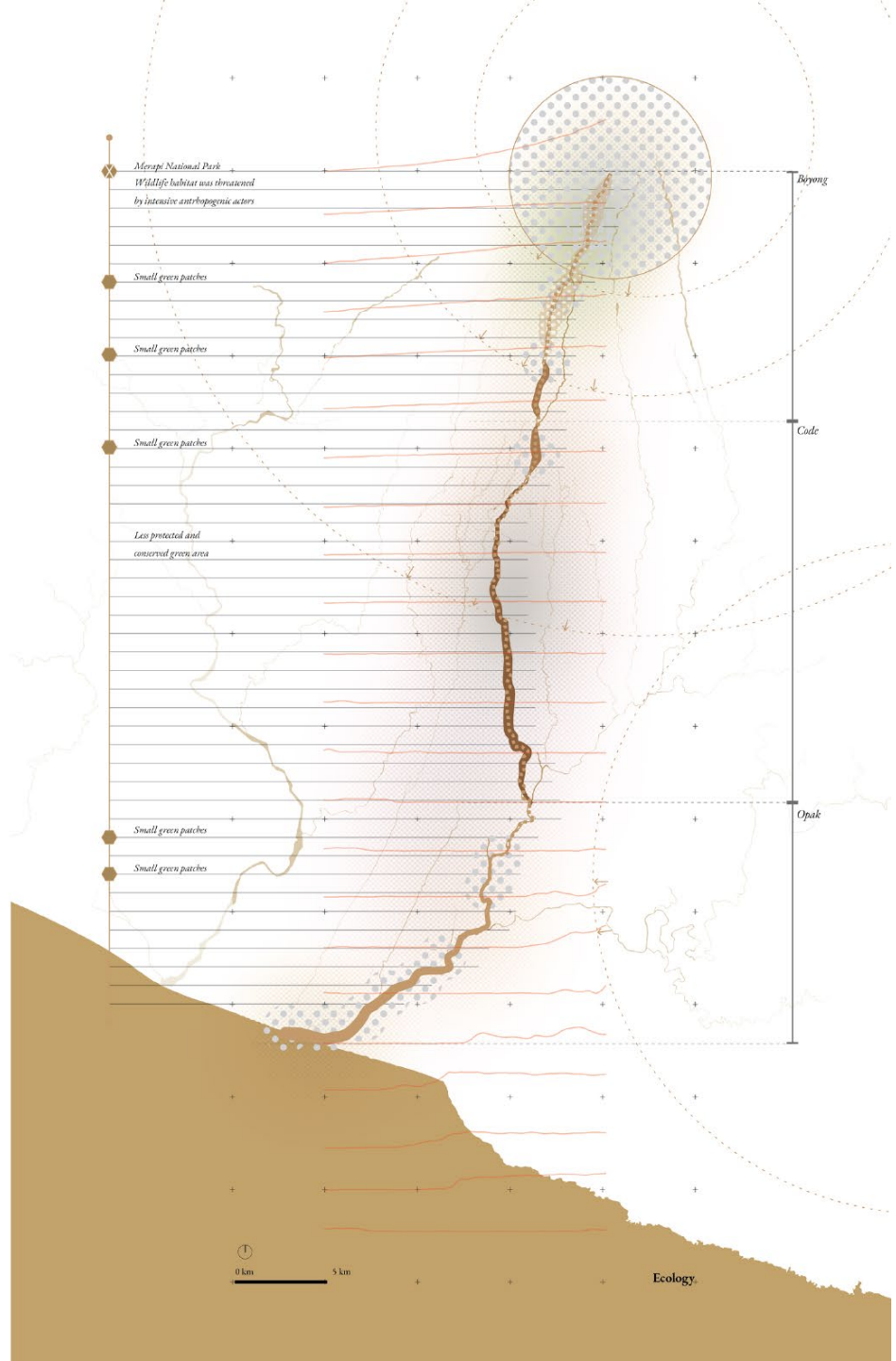
HYDROSPHERE



mid-low infiltration
low infiltration
med infiltration

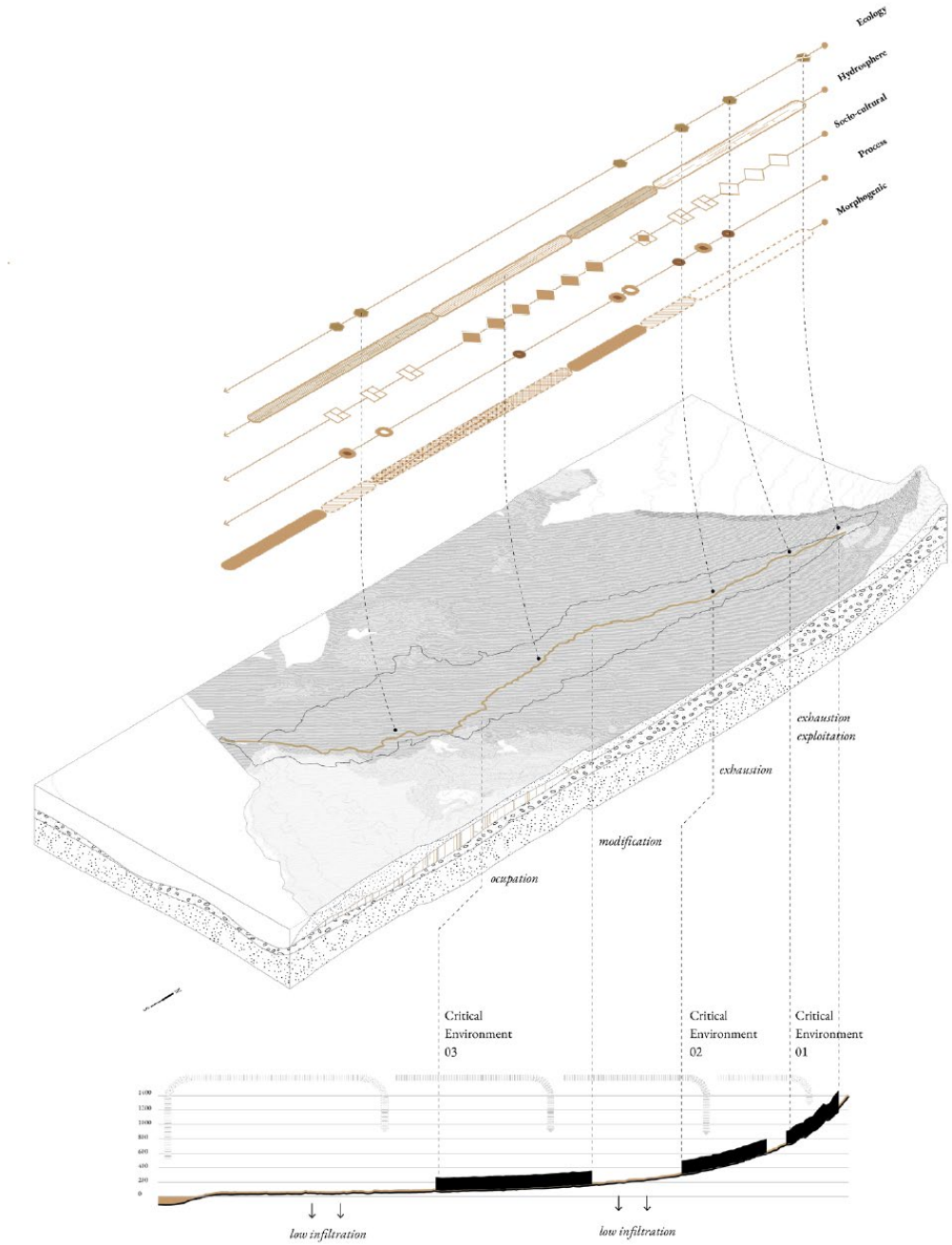
Data sources:
Geoportal Yogyakarta, 2023

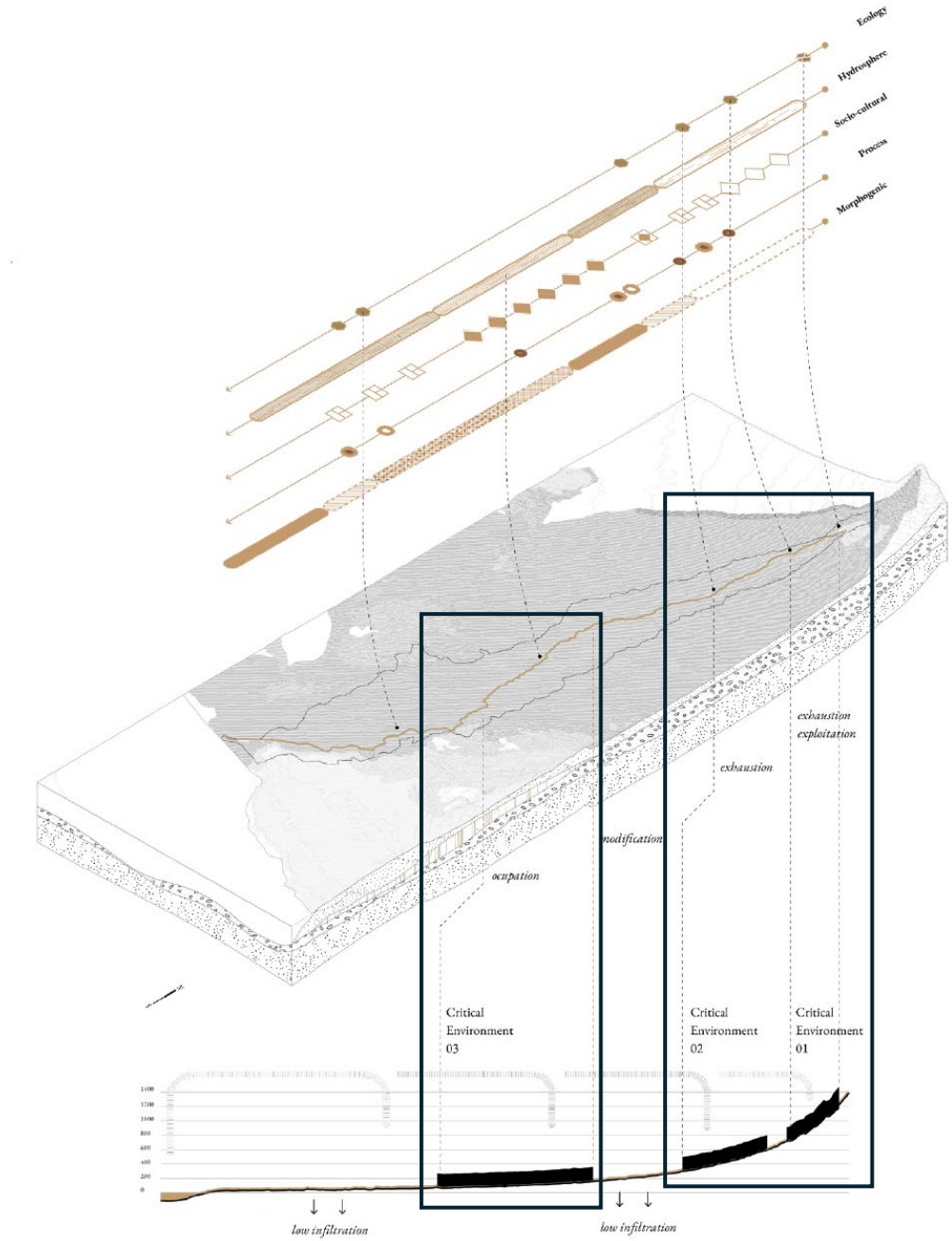
ECOLOGY



intensive tree cover
settlements/buildings
farm/industry
recreation
protected green cover
green cover

Data sources:
Geoportal Yogyakarta, 2023

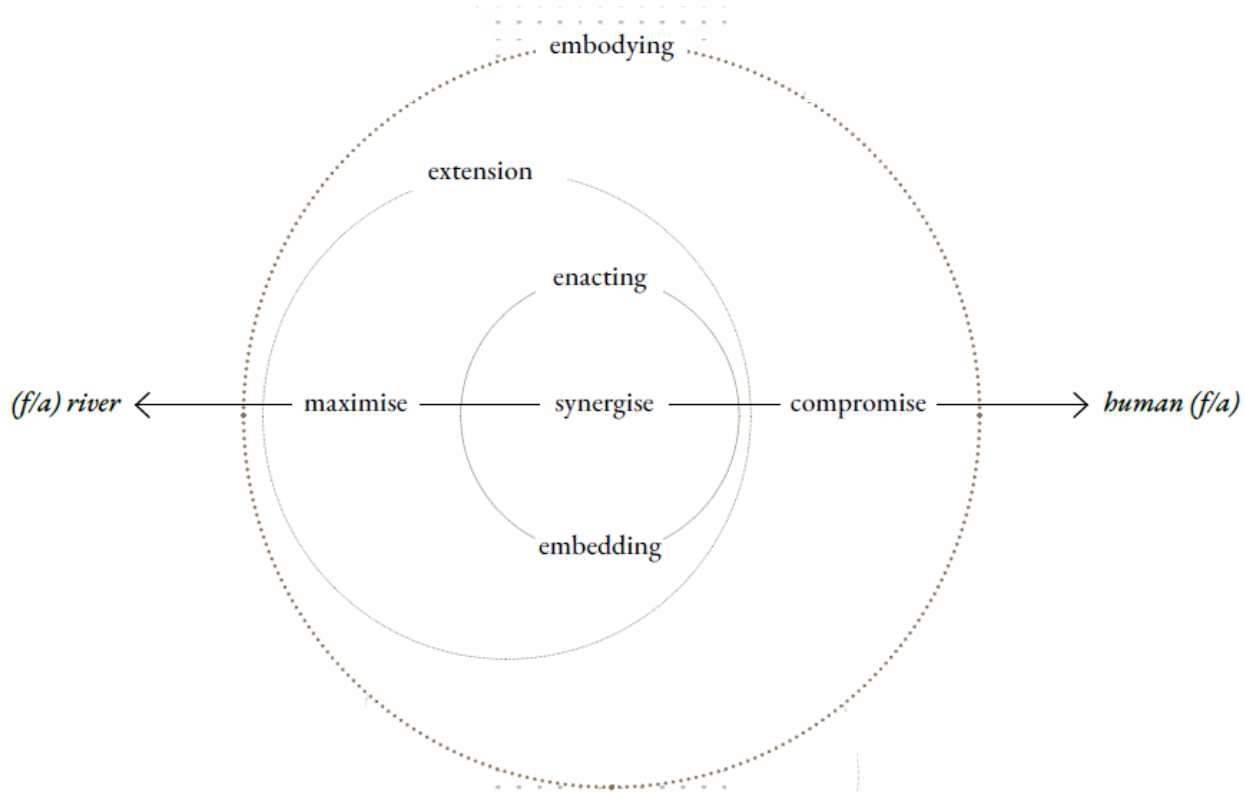

Ecology
Hydrosphere
Socio-cultural
Process
Morphogenic
exhaustion
exploitation
exhaustion
modification
occupation
Critical
Environment
03
Critical
Environment
02
Critical
Environment
01
low infiltration
low infiltration


Ecology
Hydrosphere
Socio-cultural
Process
Morphogenic
exhaustion
exploitation
exhaustion
modification
occupation
Critical
Environment
03
Critical
Environment
02
Critical
Environment
01
low infiltration
low infiltration

“That’s why the clean water (from spring and river) that we use must be clean again, at least lower the pollution particles. Humans and water are in harmony because, in *adat* (tradition), humans, nature, plants and water are in harmony. A state of balance”

Ijat, indigeneous resident of Naga Village

part 03 – *critical forms*


embodying
extension
enacting
(f/a) river
maximise
synergise
compromise
human (f/a)
embedding

Compromise: Striving for a balance where various stakeholders are willing to make concessions in order to reach a mutually agreeable solution that respects the presence and health of the river within the urban landscape.

Maximise: Ensuring that the benefits and functionalities of both the river and urban spaces are optimised to their fullest potential, meeting the needs of both the natural environment and the community efficiently.

Synergise: Creating a synergy between urban development and river conservation efforts to produce outcomes that benefit both the urban environment and the river ecosystem.

empathy

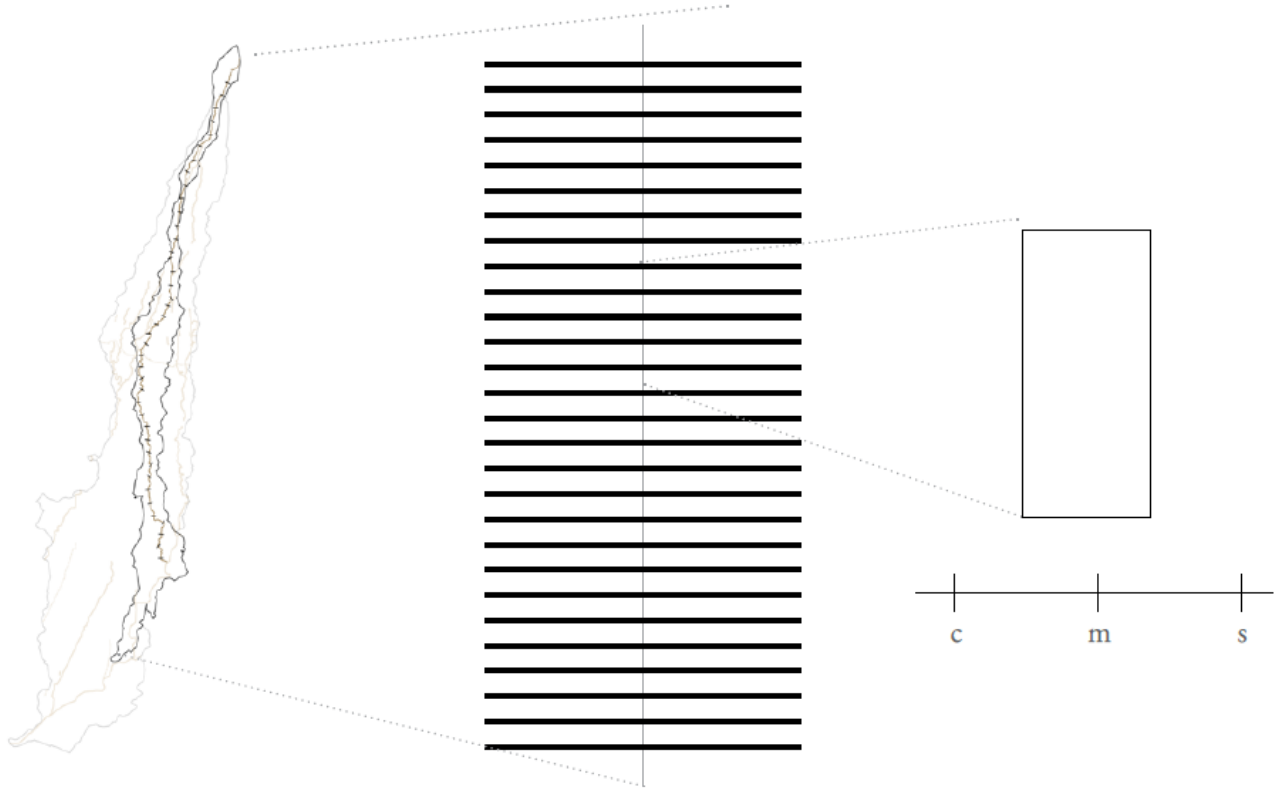
Compromise: Striving for a balance where various stakeholders are willing to make concessions in order to reach a mutually agreeable solution that respects the presence and health of the river within the urban landscape.

programme

Maximise: Ensuring that the benefits and functionalities of both the river and urban spaces are optimised to their fullest potential, meeting the needs of both the natural environment and the community efficiently.

mental recognition

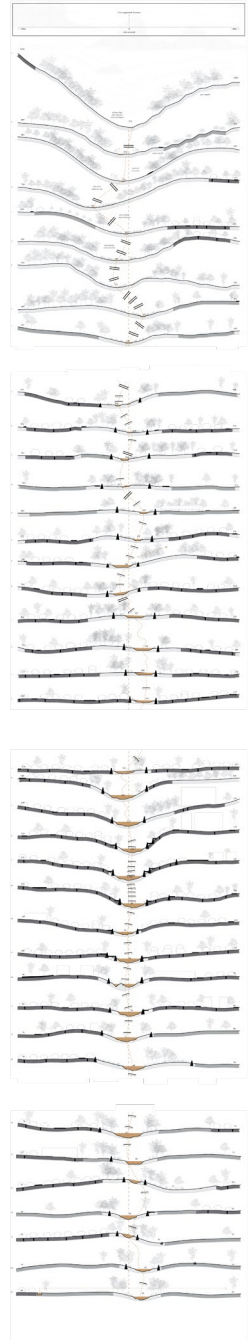
Synergise: Creating a synergy between urban development and river conservation efforts to produce outcomes that benefit both the urban environment and the river ecosystem.



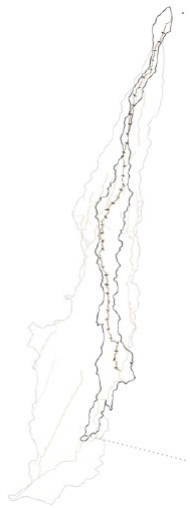
01. choosen river equal transects, limit some properties (i.e. centroid distances)

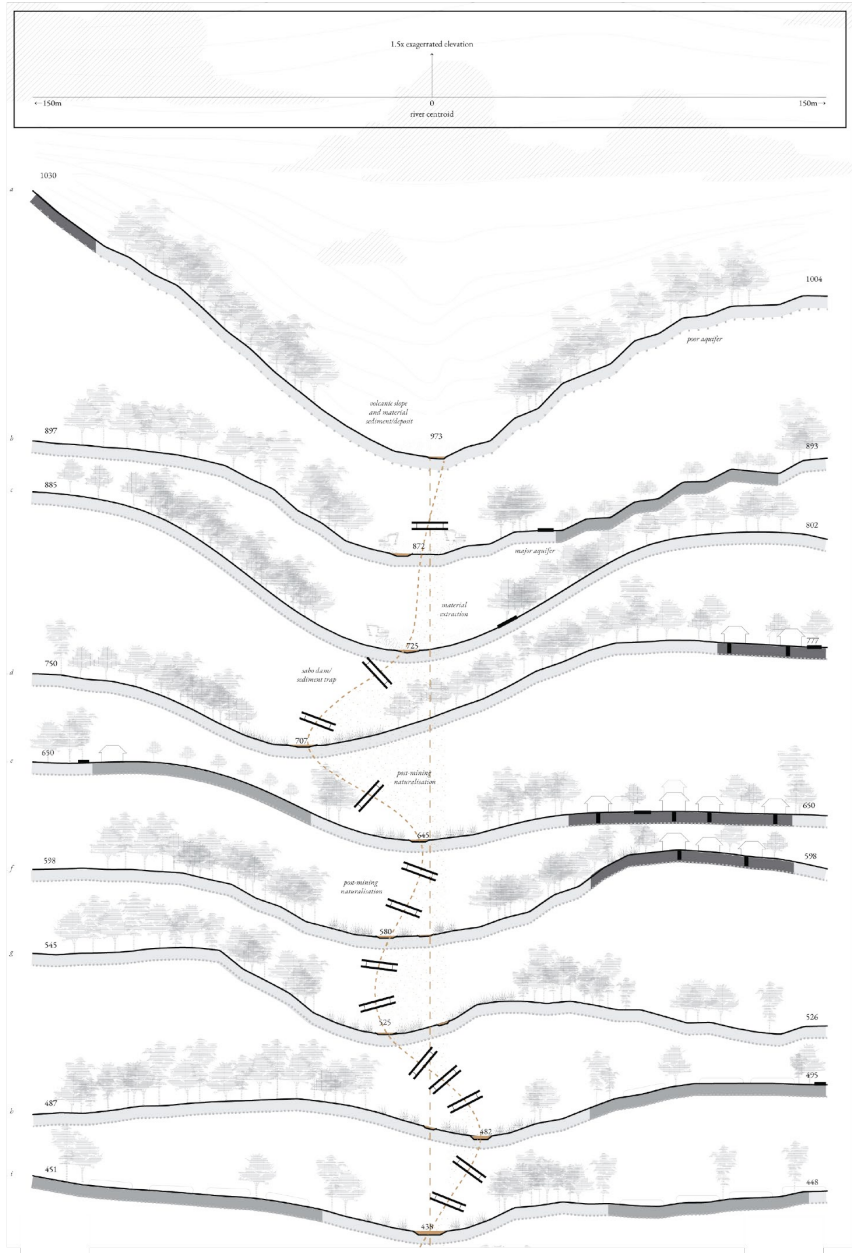
02. put in a line and cover its compositions (i.e. heights, tree coverage, etc.

03. analyse and propose design actions considers three degrees and/or scales

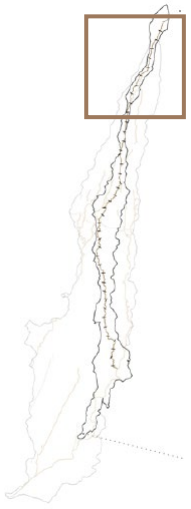


river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall





river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall

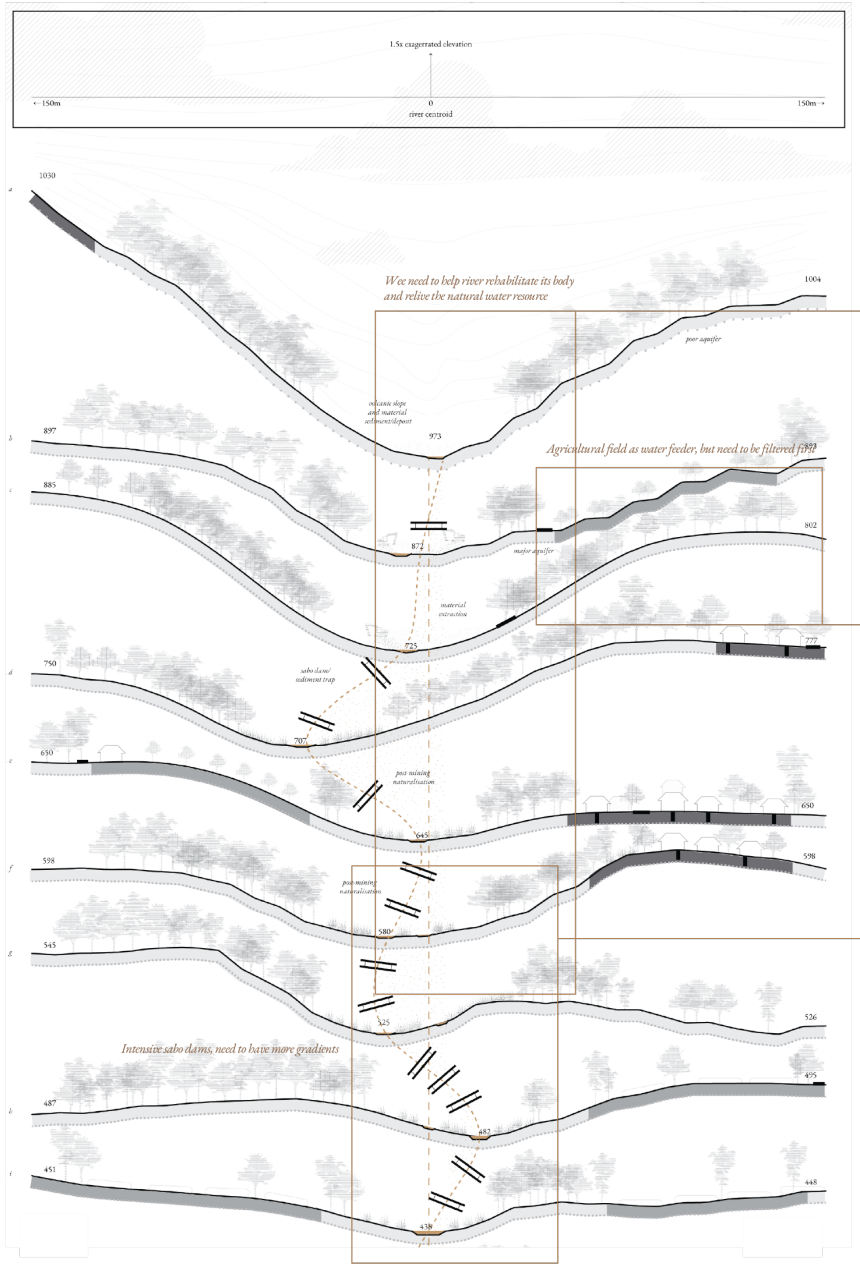


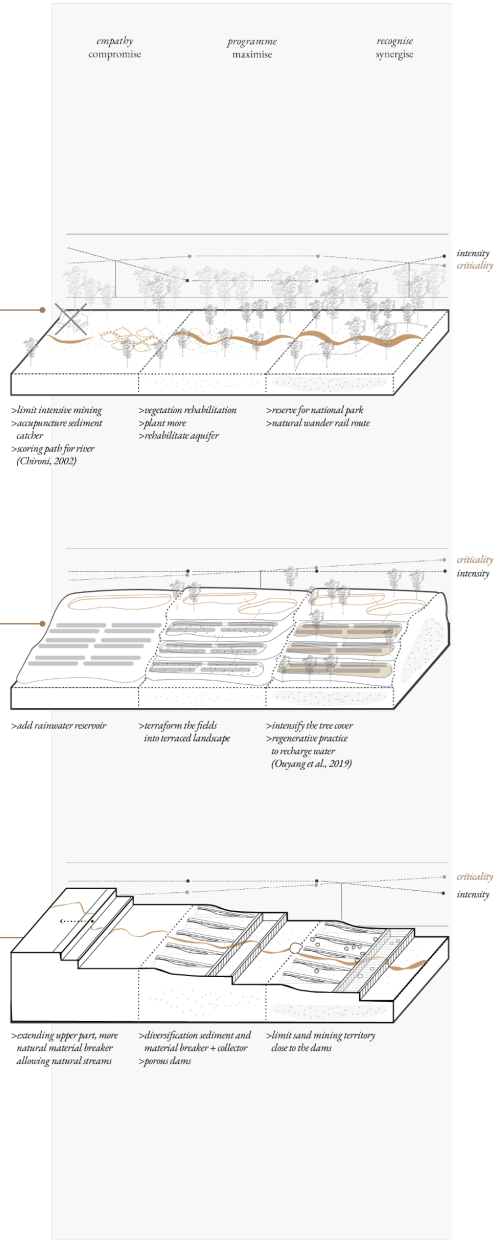
empathy
compromise

programme
maximise

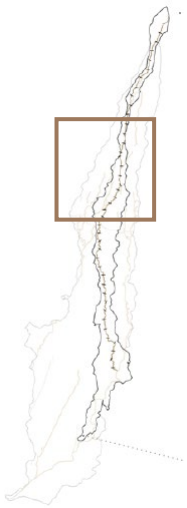
recognise
synergise

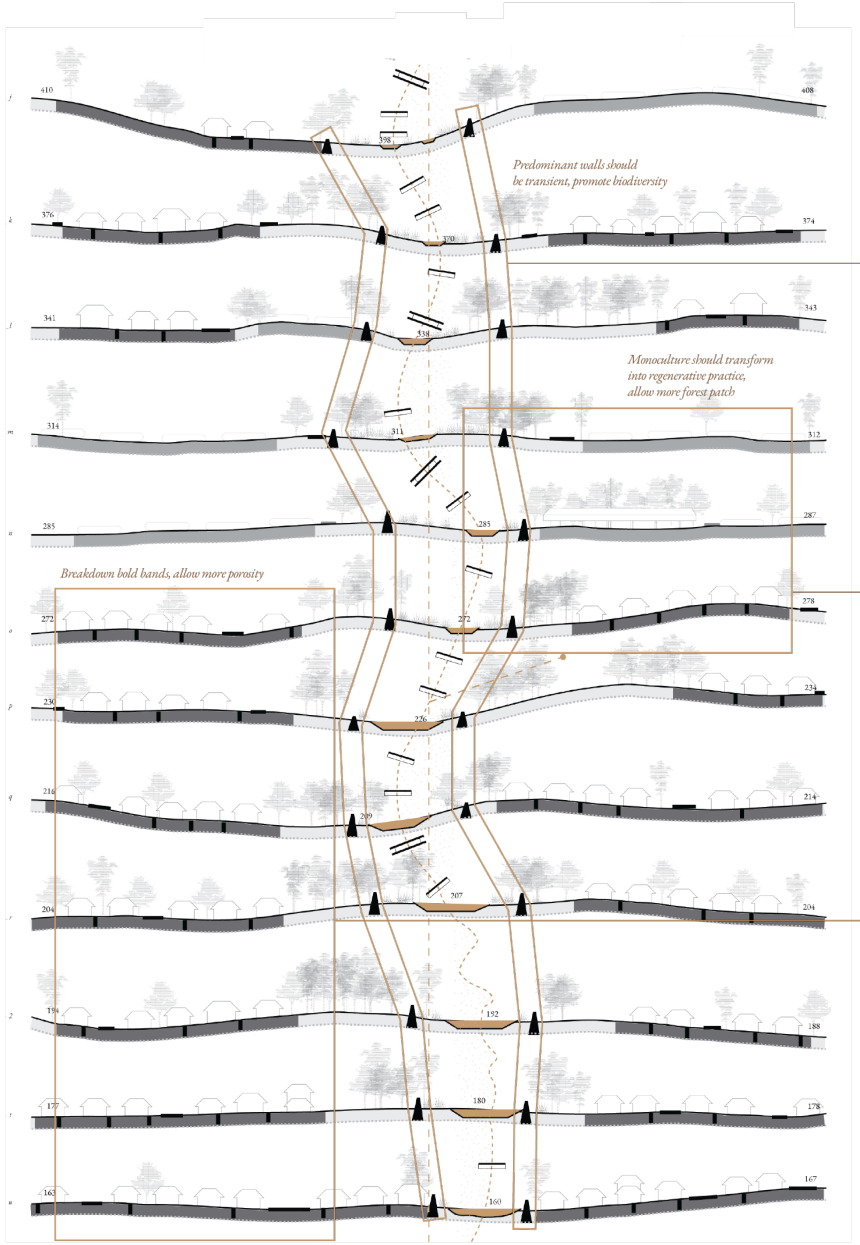
river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall

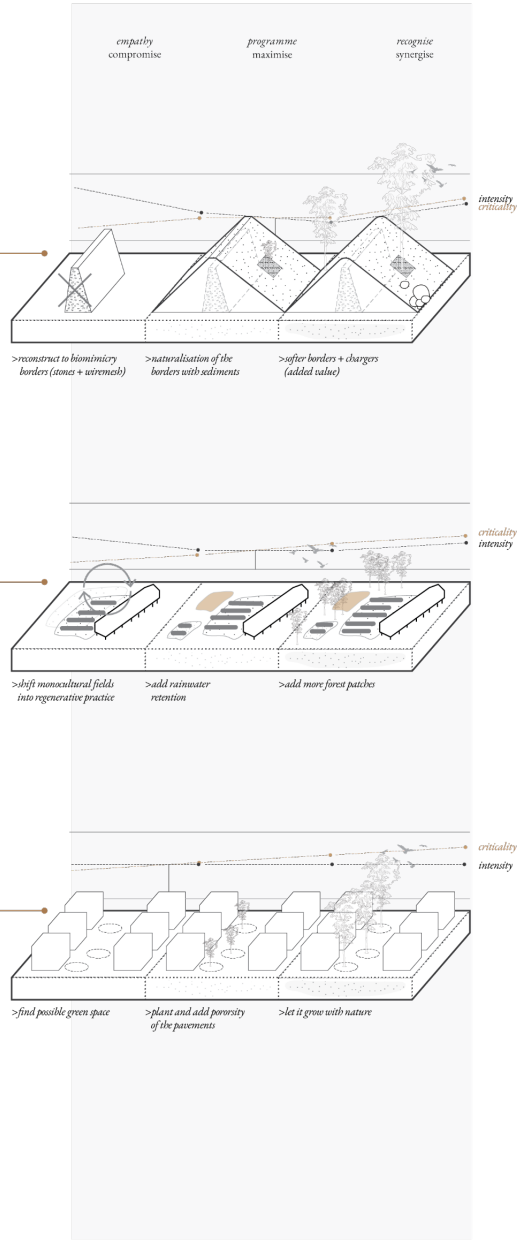




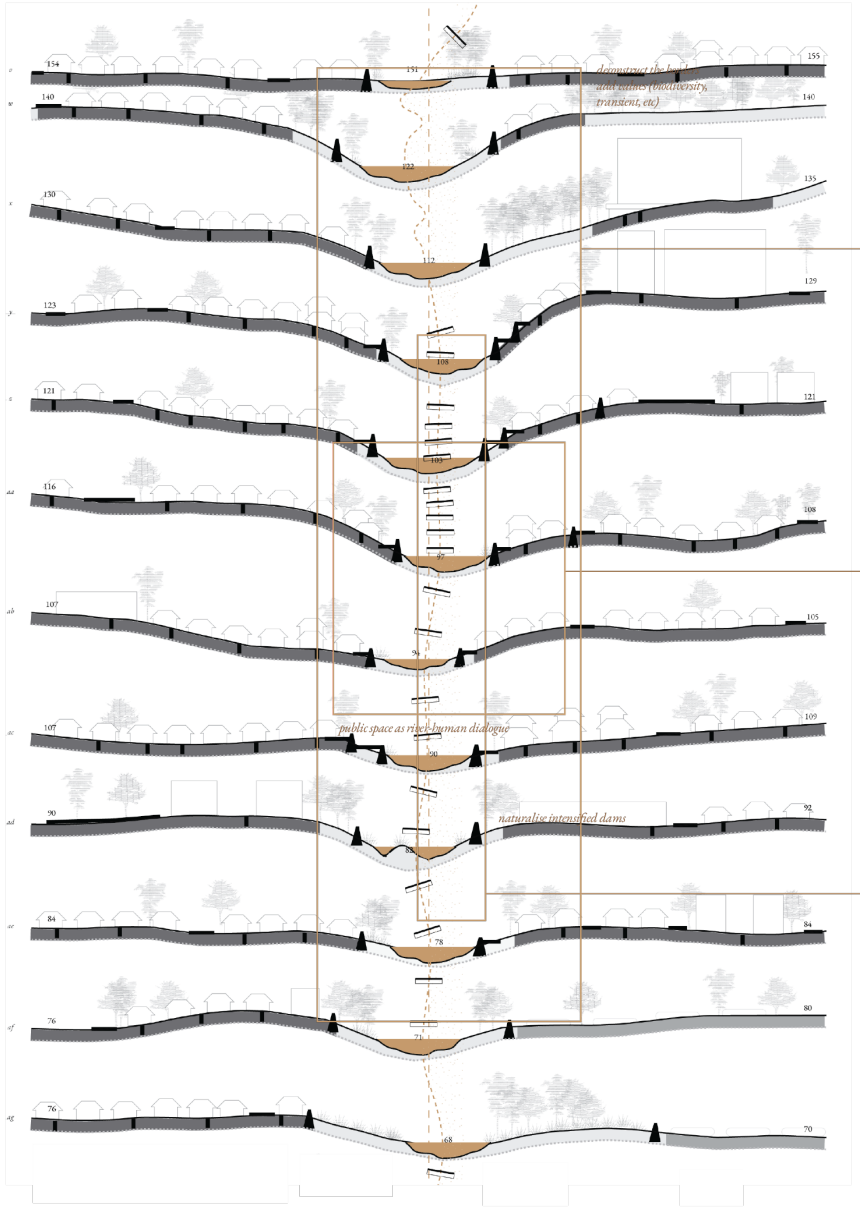
river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall

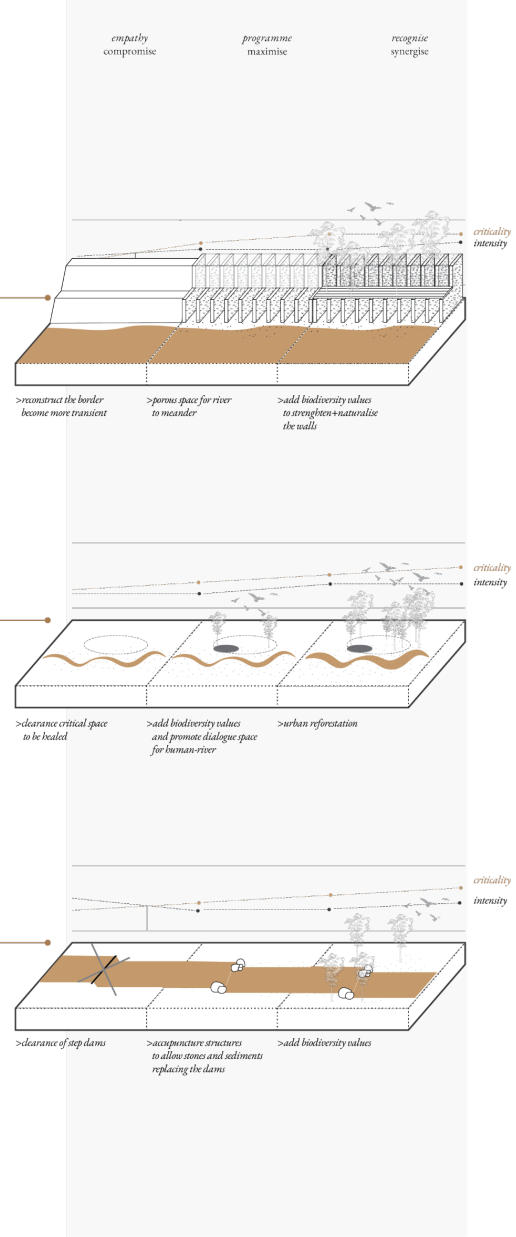


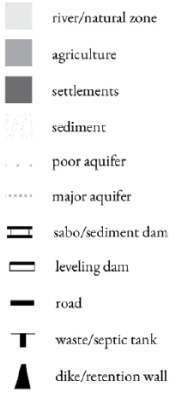


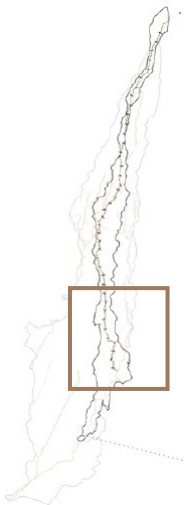


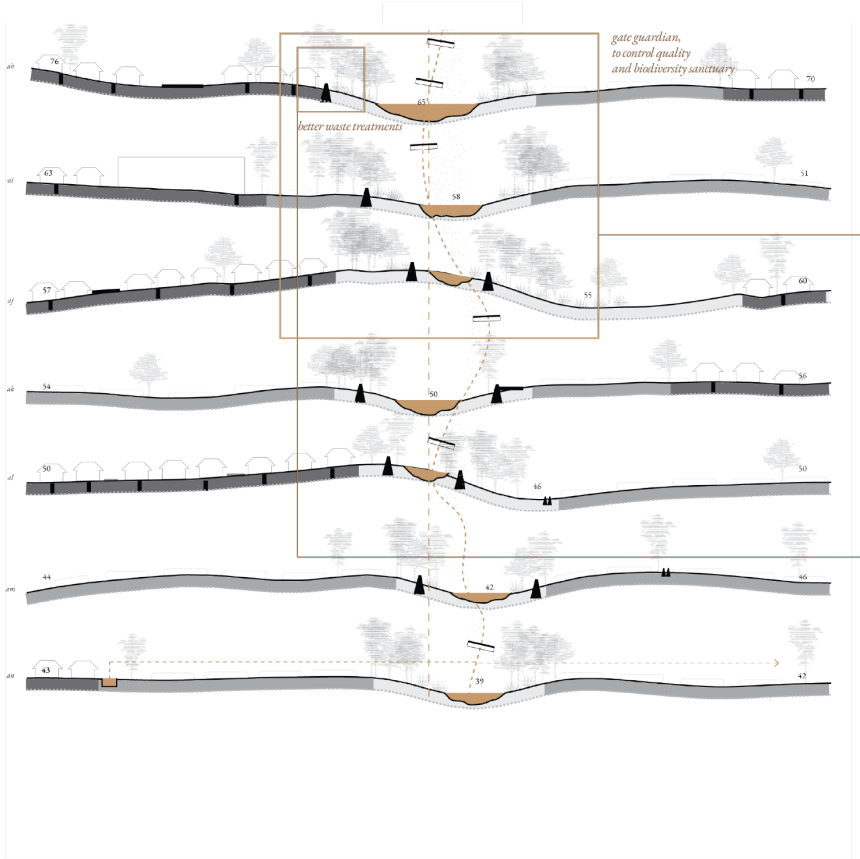
river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall

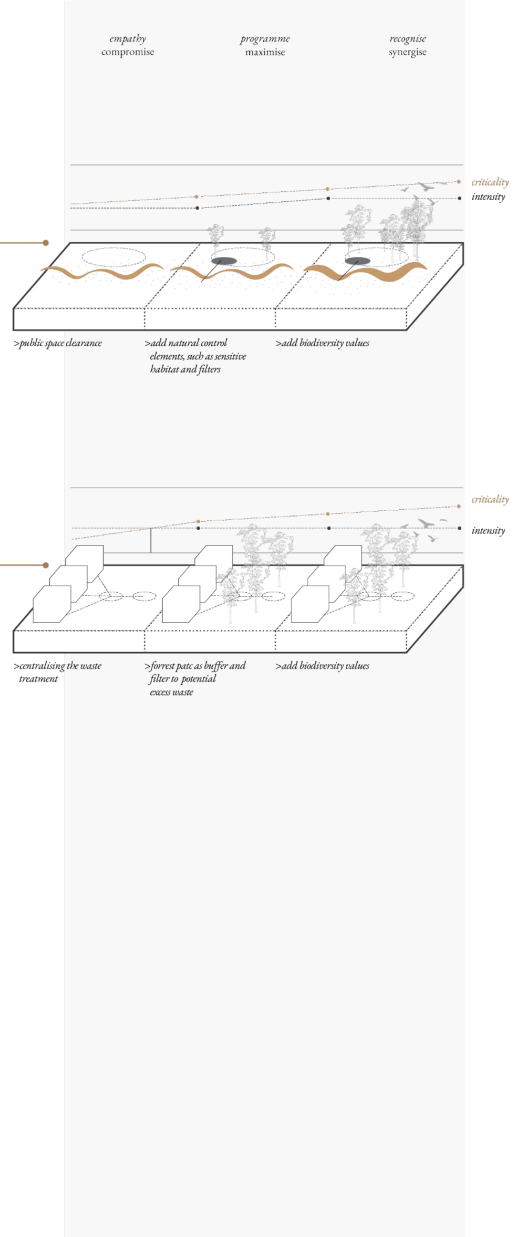

154
151
155
140
140
122
130
135
112
123
129
108
121
121
105
116
108
87
107
105
96
107
109
90
92
88
84
84
78
76
80
71
76
70
68
deconstruct the border and values (biodiversity, transient, etc)
public space as river-human dialogue
naturalise intensified dams

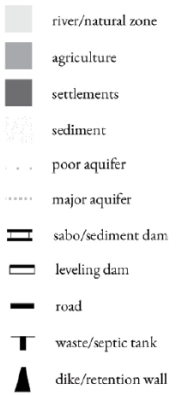

empathy
compromise
programme
maximise
recognise
synergise
criticality
intensity
>reconstruct the border become more transient
>porous space for river to meander
>add biodiversity values to strenghten+naturalise the walls
criticality
intensity
>clearance critical space to be healed
>add biodiversity values and promote dialogue space for human-river
>urban reforestation
criticality
intensity
>clearance of step dams
>accupuncture structures to allow stones and sediments replacing the dams
>add biodiversity values


river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall



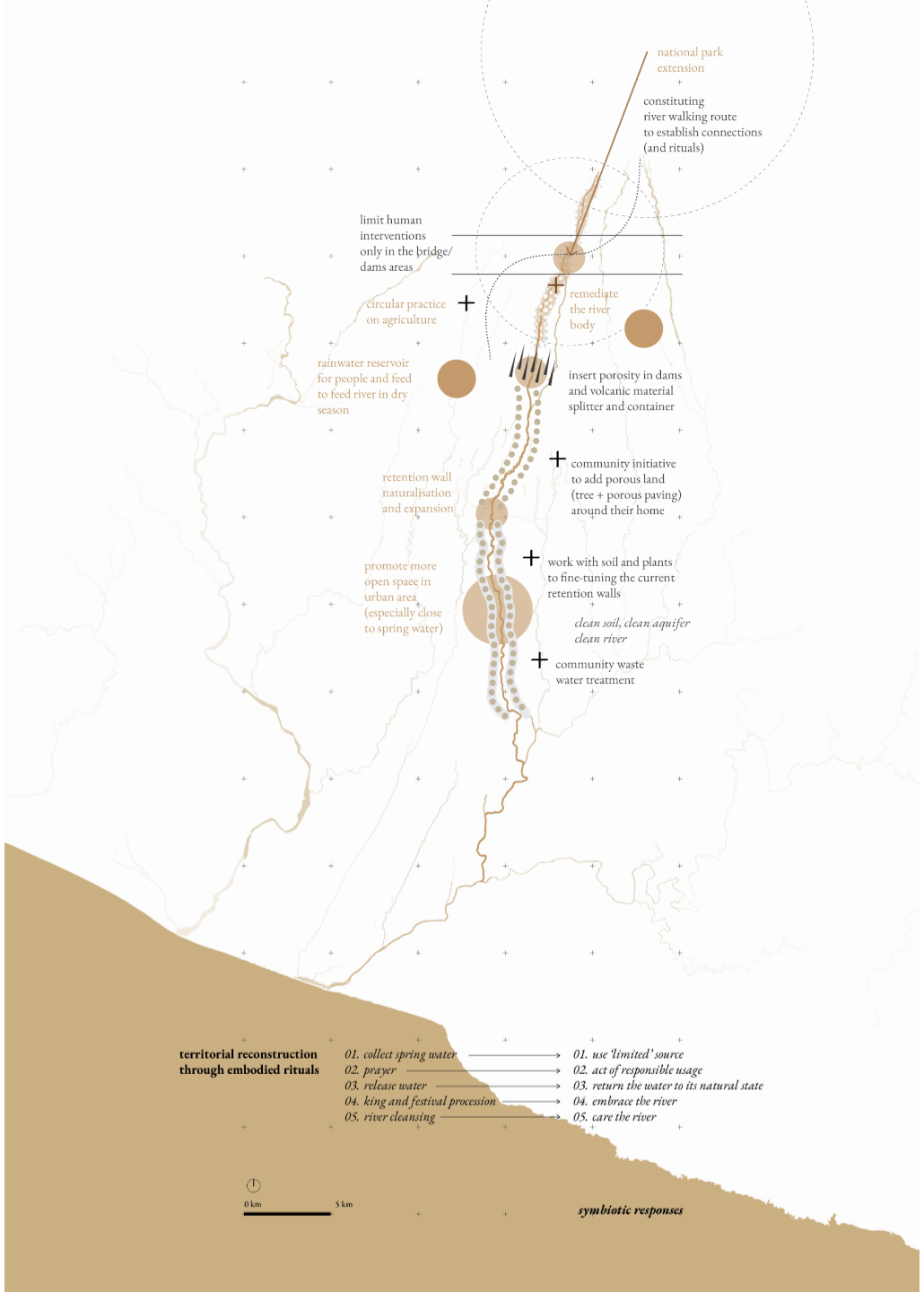

gate guardian,
to control quality
and biodiversity sanctuary
better waste treatments
76
70
63
51
58
57
60
55
54
56
50
50
46
44
46
42
43
42
39

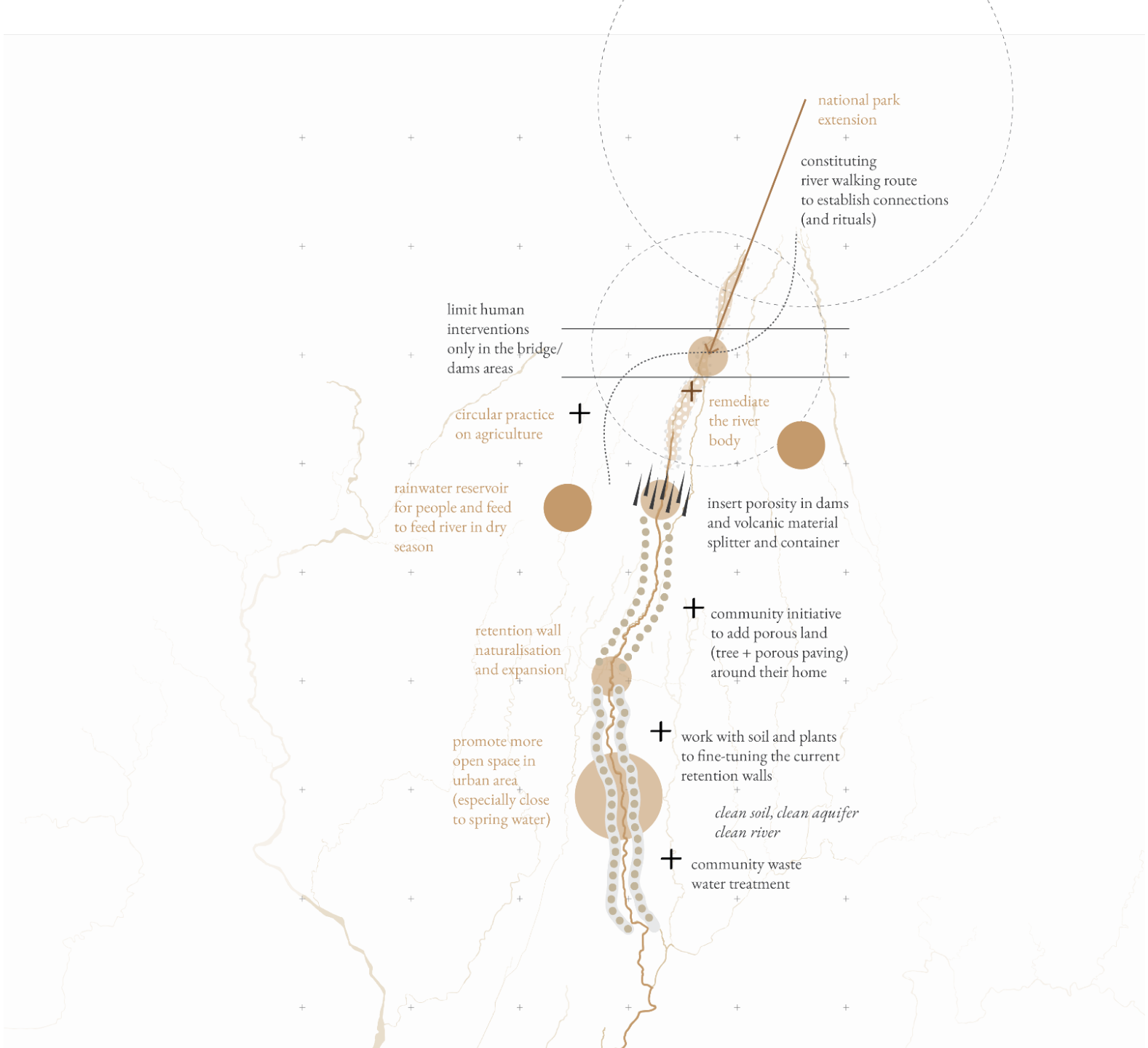

empathy
compromise
programme
maximise
recognise
synergise
criticality
intensity
>public space clearance
>add natural control elements, such as sensitive habitat and filters
>add biodiversity values
criticality
intensity
>centralising the waste treatment
>forrest patc as buffer and filter to potential exess waste
>add biodiversity values

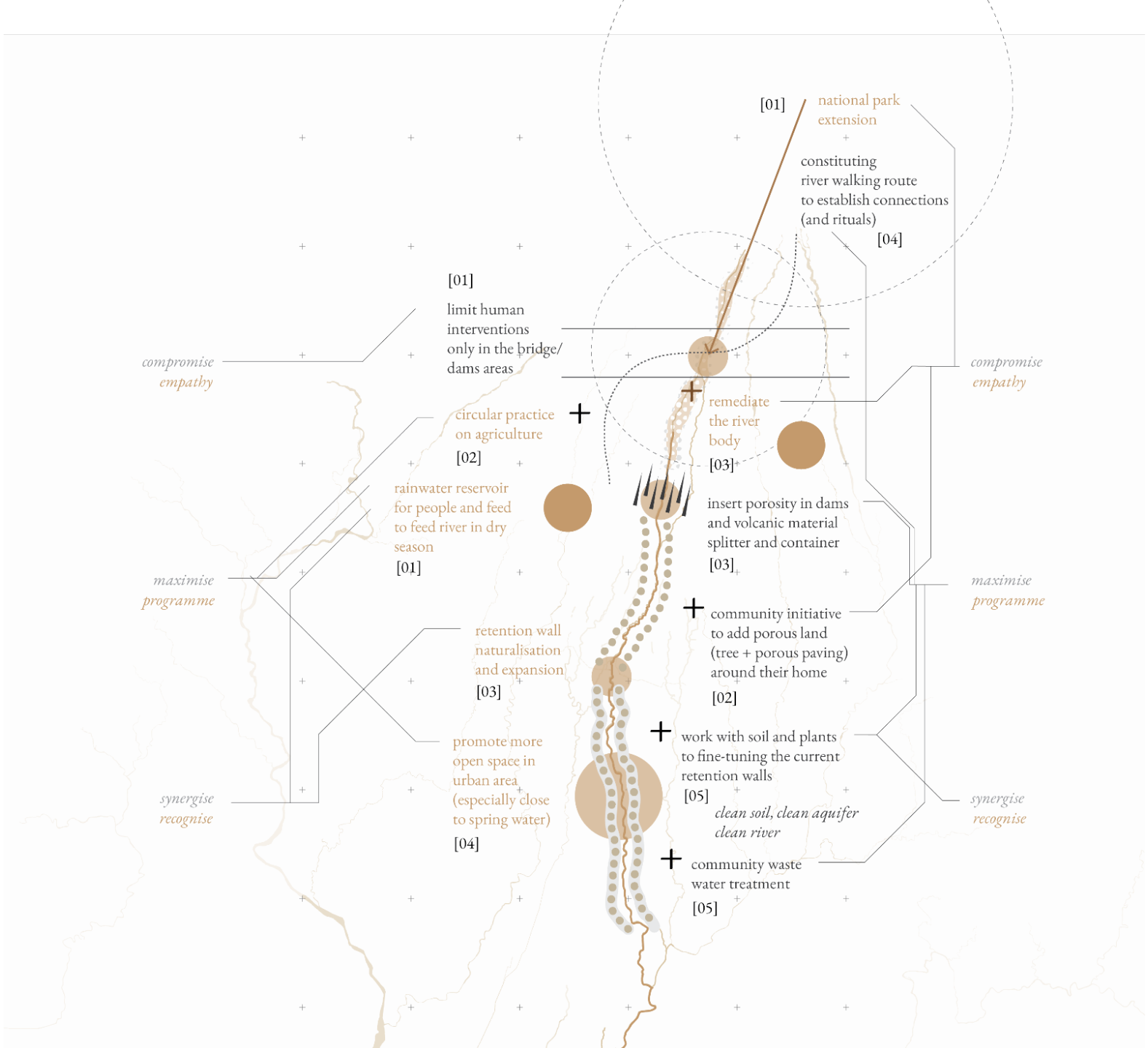

river/natural zone
agriculture
settlements
sediment
poor aquifer
major aquifer
sabo/sediment dam
leveling dam
road
waste/septic tank
dike/retention wall

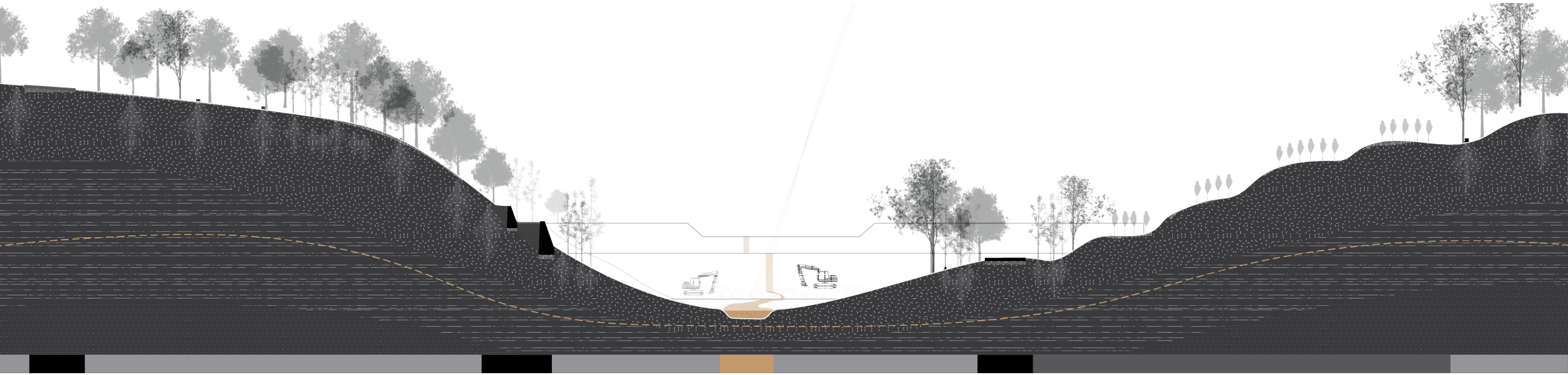

territorial reconstruction
through embodied rituals
01. collect spring water
02. prayer
03. release water
04. king and festival procession
05. river cleansing
01. use 'limited' source
02. act of responsible usage
03. return the water to its natural state
04. embrace the river
05. care the river
0 km
5 km
symbiotic responses


territorial reconstruction
through embodied rituals
01. collect spring water
02. prayer
03. release water
04. king and festival procession
05. river cleansing
01. use 'limited' source
02. act of responsible usage
03. return the water to its natural state
04. embrace the river
05. care the river
0 km
5 km
symbiotic responses


national park extension
constituting river walking route to establish connections (and rituals)
limit human interventions only in the bridge/ dams areas
circular practice on agriculture
remediate the river body
rainwater reservoir for people and feed to feed river in dry season
insert porosity in dams and volcanic material splitter and container
community initiative to add porous land (tree + porous paving) around their home
retention wall naturalisation and expansion
work with soil and plants to fine-tuning the current retention walls
promote more open space in urban area (especially close to spring water)
clean soil, clean aquifer
clean river
community waste water treatment
territorial reconstruction through embodied rituals
01. collect spring water
02. prayer
03. release water
04. king and festival procession
05. river cleansing
01. use 'limited' source
02. act of responsible usage
03. return the water to its natural state
04. embrace the river
05. care the river
0 km
5 km
symbiotic responses

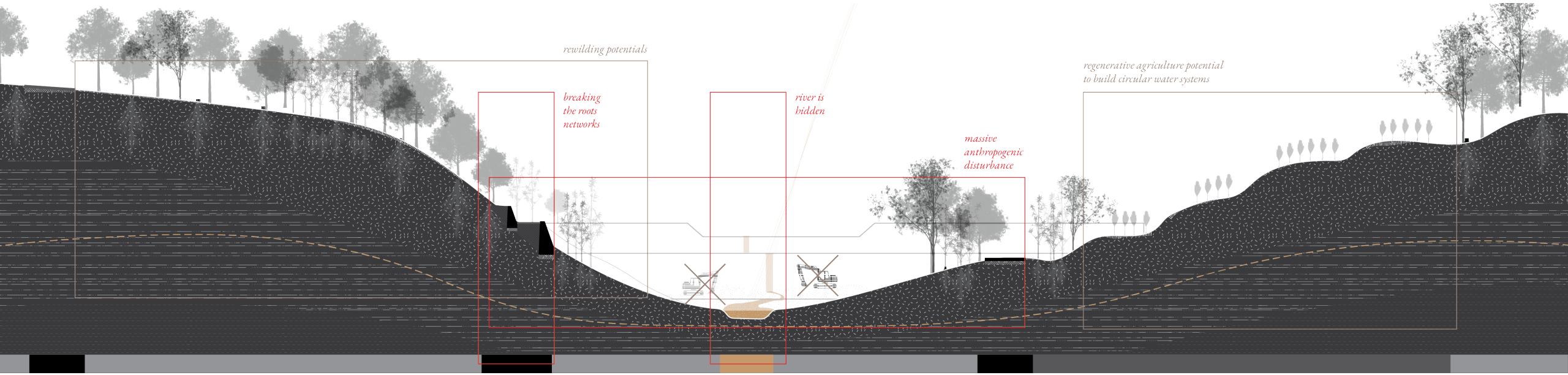

national park
extension
constituting
river walking route
to establish connections
(and rituals)
limit human
interventions
only in the bridge/
dams areas
circular practice
on agriculture
remediate
the river
body
rainwater reservoir
for people and feed
to feed river in dry
season
insert porosity in dams
and volcanic material
splitter and container
community initiative
to add porous land
(tree + porous paving)
around their home
retention wall
naturalisation
and expansion
promote more
open space in
urban area
(especially close
to spring water)
work with soil and plants
to fine-tuning the current
retention walls
clean soil, clean aquifer
clean river
community waste
water treatment


[01]
national park extension
constituting river walking route to establish connections (and rituals)
[04]
[01]
limit human interventions only in the bridge/ dams areas
compromise
empathy
circular practice on agriculture
[02]
remediate the river body
[03]
compromise
empathy
rainwater reservoir for people and feed to feed river in dry season
[01]
insert porosity in dams and volcanic material splitter and container
[03]
maximise
programme
community initiative to add porous land (tree + porous paving) around their home
[02]
maximise
programme
retention wall naturalisation and expansion
[03]
promote more open space in urban area (especially close to spring water)
[04]
work with soil and plants to fine-tuning the current retention walls
[05]
clean soil, clean aquifer
clean river
synergise
recognise
synergise
recognise
community waste water treatment
[05]



temporal frame

status quo

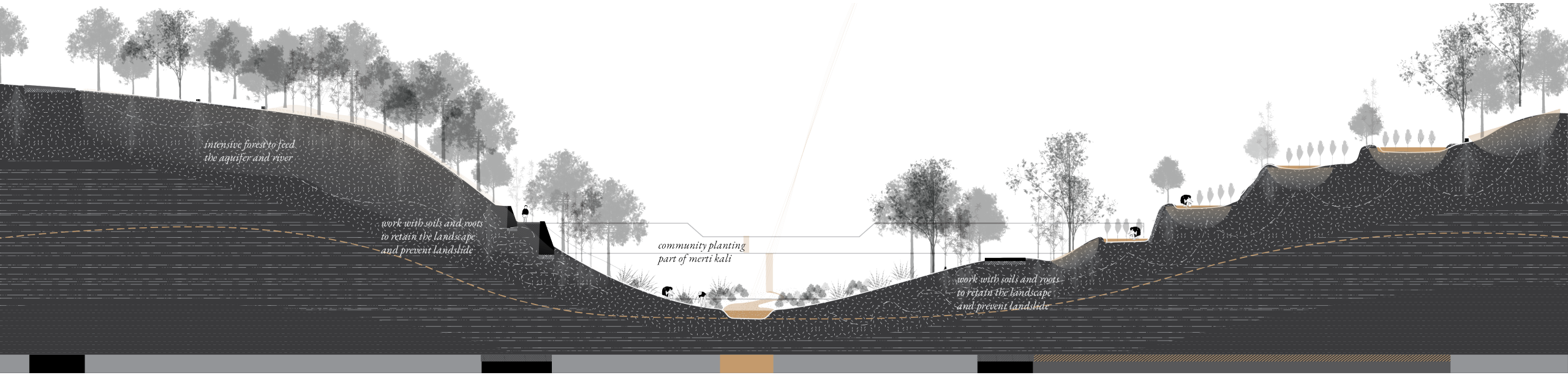


temporal frame

discover way to relive the river

status quo

potentials



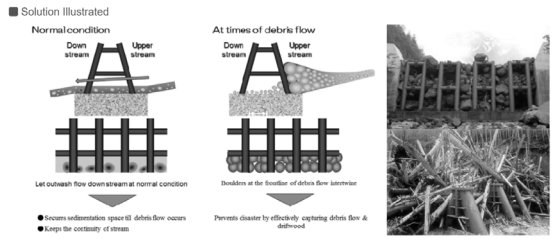
temporal frame

build empathy – act of care

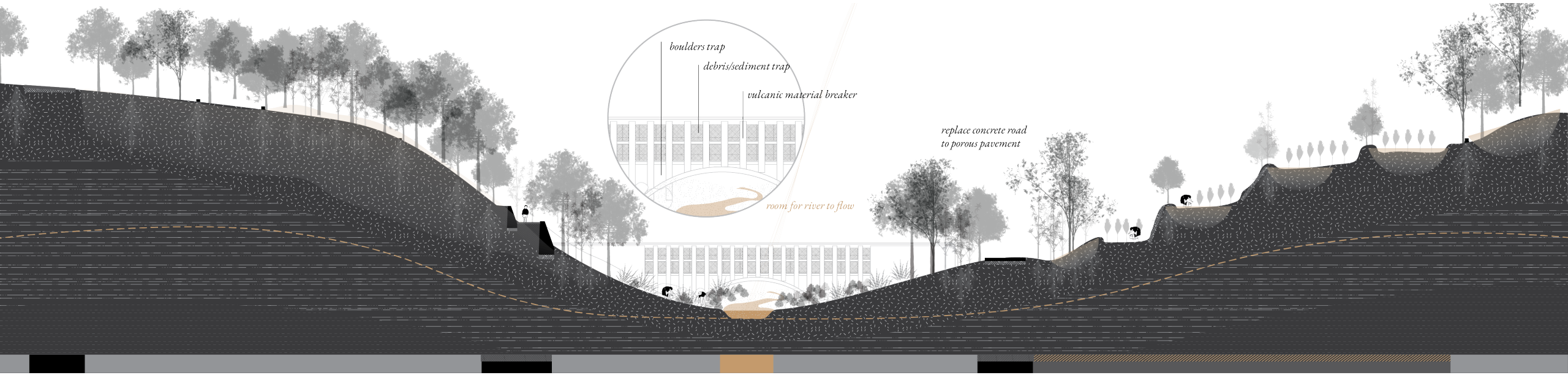
status quo

potentials

compromise



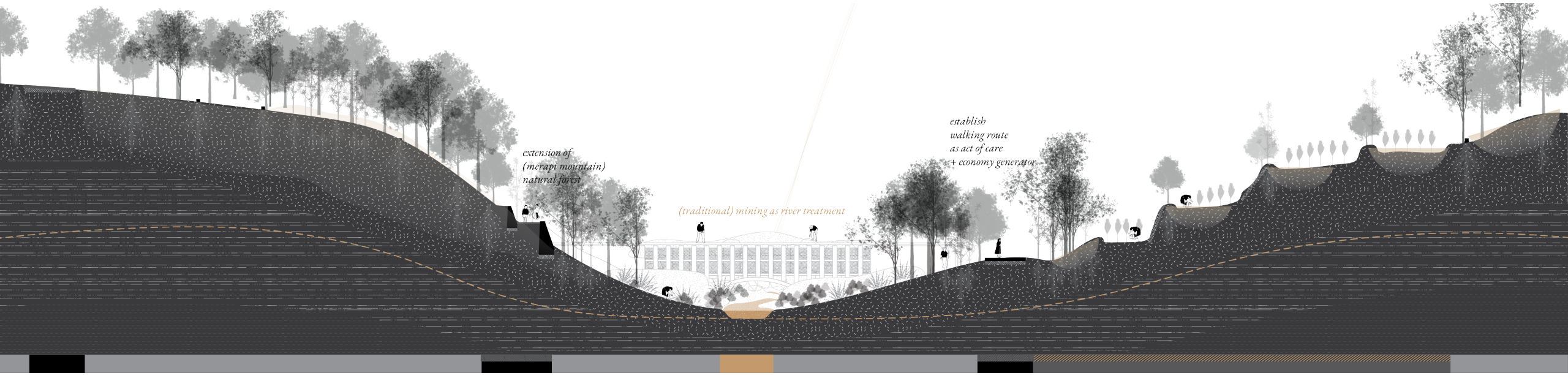
learning from Japan



temporal frame

program changes – total finetuning

status quo | *potentials* | *compromise* | *maximise*



temporal frame

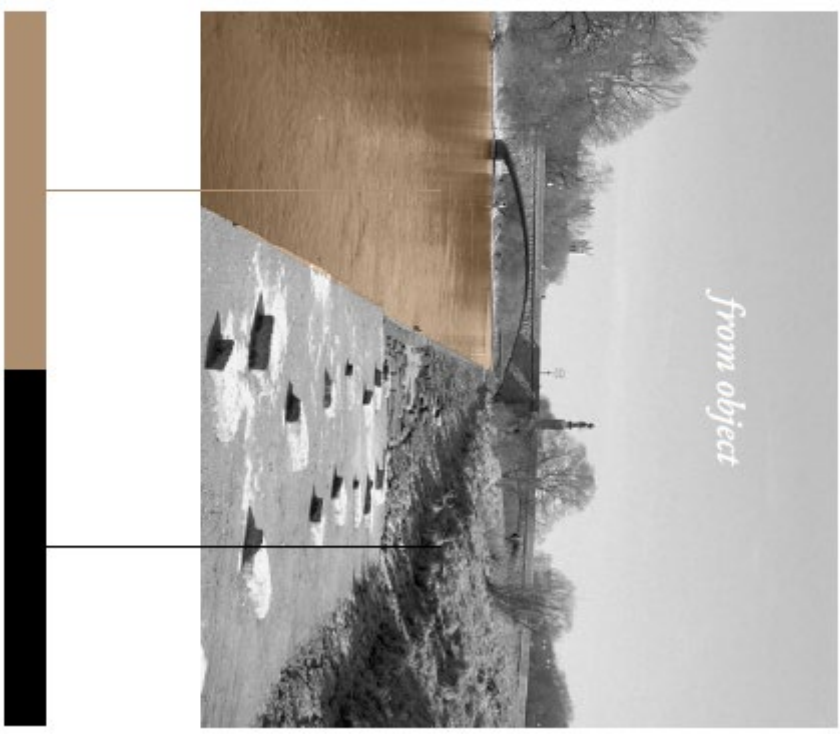
dialogue of care

status quo — *potentials* — *compromise* — *maximise* — *synergise*

part 04 – *dialogue of care*

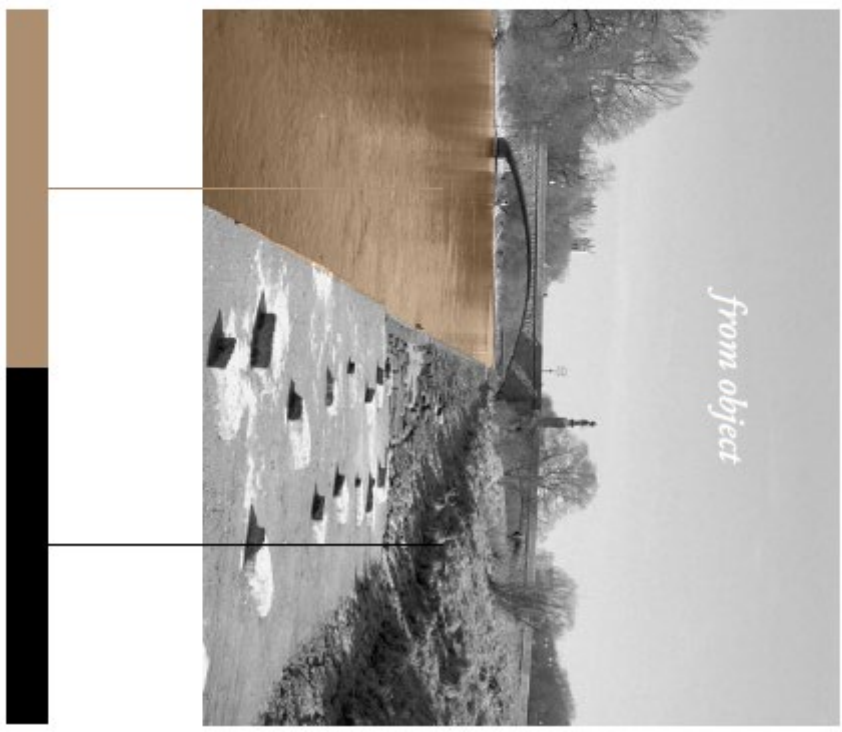
From object
to subject
↓

Renaturalisation of Isar River
(Daniela Schaufuß; Source: City of Munich, 2013)
↓



From object
to subject
↓

Renaturalisation of Isar River
(Daniela Schaufuß; Source: City of Munich, 2013)
↓



dialogue of care—elaborated design framework

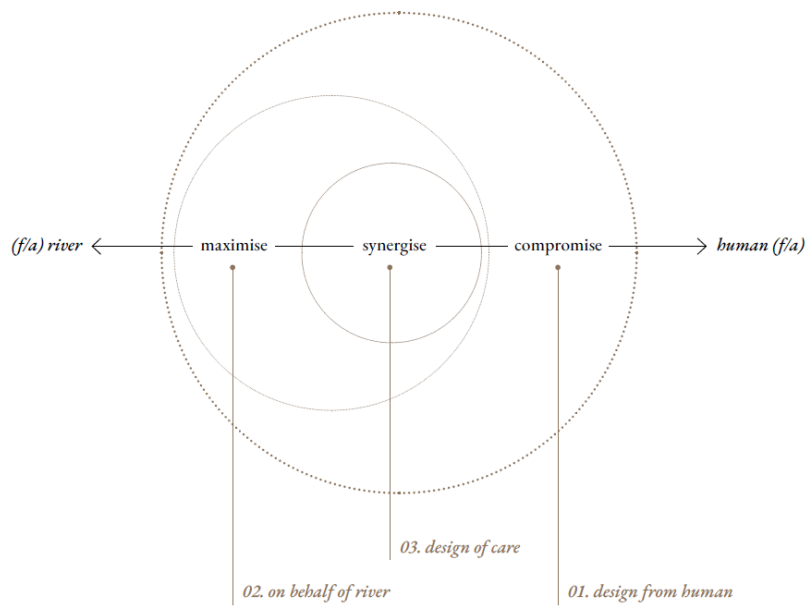
inspiration and data gathering — *preparatory*

group discussion	systemic comprehension	stimulation
• stakeholders • social-cultural • economy potential	• hydrology, ecology, morphology • habitat health	• archive • fieldwork • problem inventory

notions of considerations — *design principles*

lo-tek	right of river	in search of balance
• [*a*] is current 'new nature' (***lo***) • [*b*] is added value (***tek***) • [*c*] is a+b, new + value	• flow, clean, sustainable, function, biodiverse, restored	• river and human rights synergised • vegetation machine

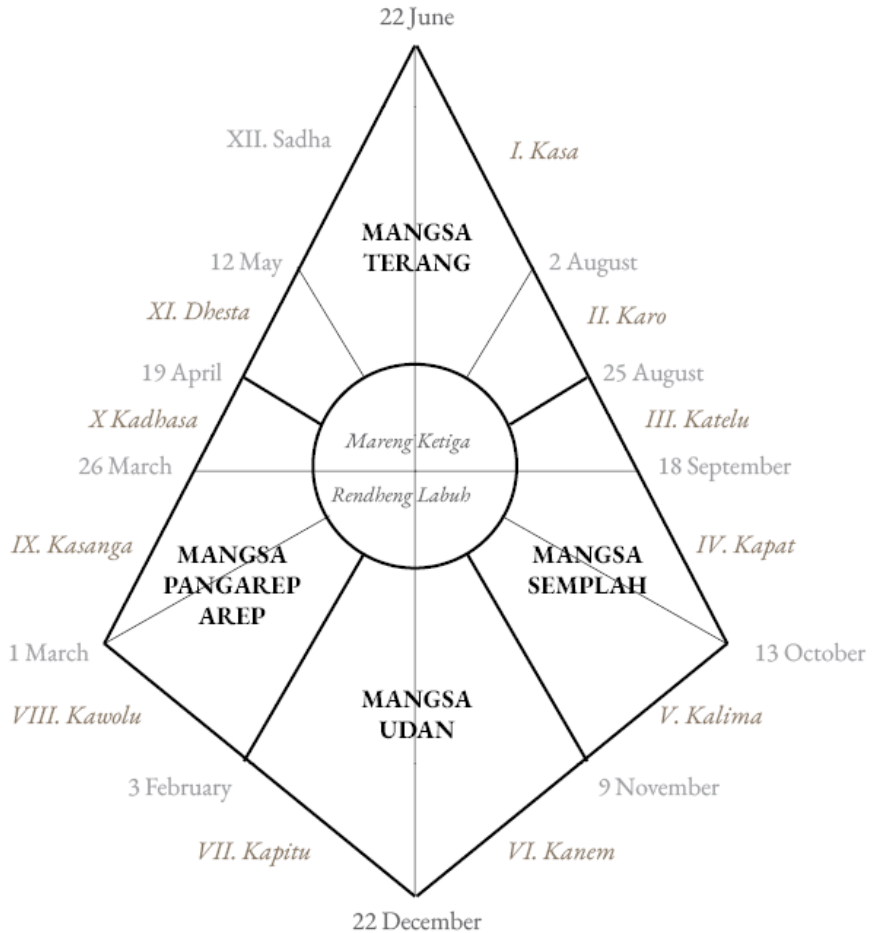
three phase of borderscaping riparian territory — *design as instrument*



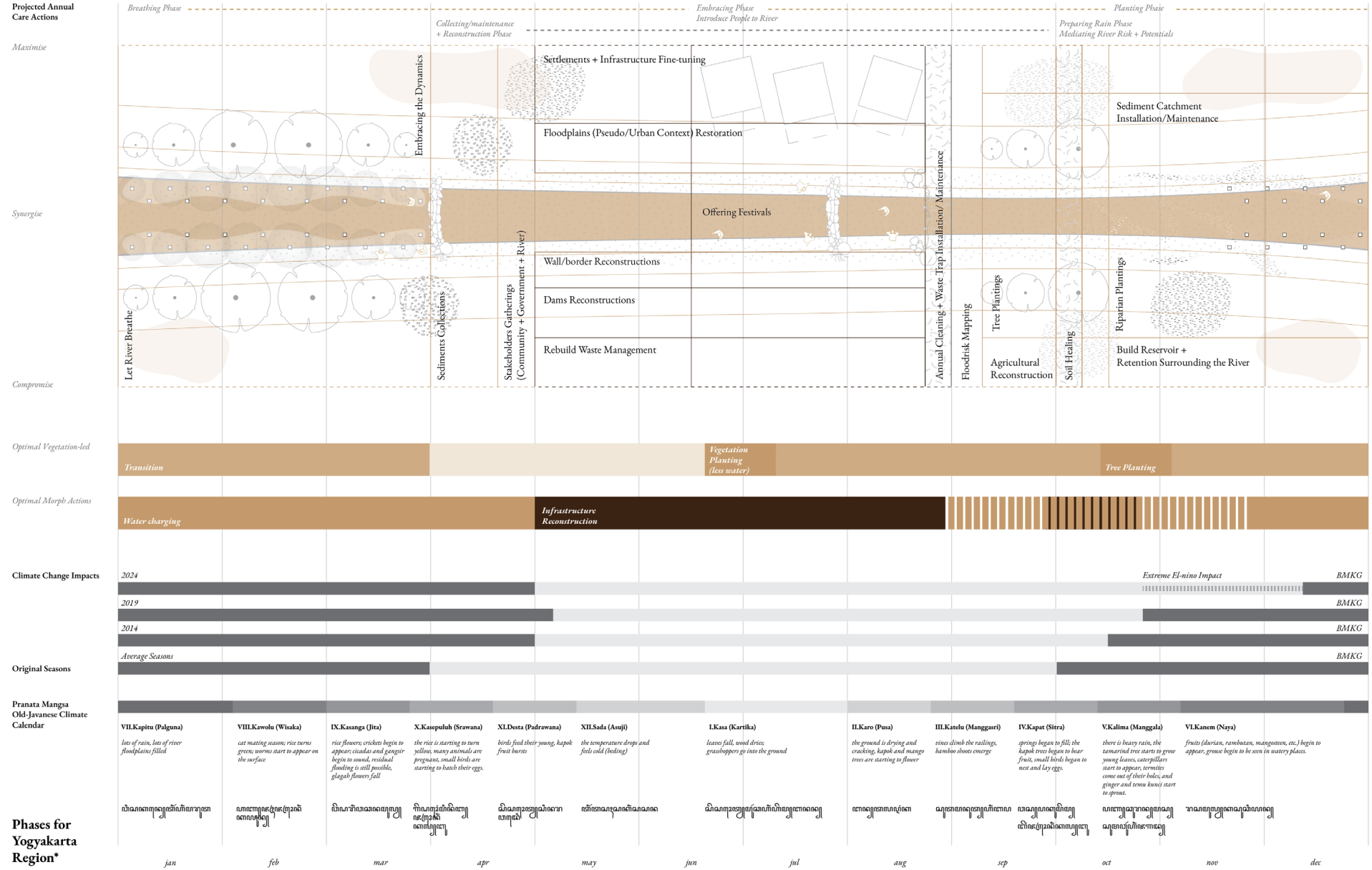
Naturecultures—Decentering Ethics

Naturecultural thinking is an ecosmology of affirmative blurred boundaries between the technological and the organic as well as the animal and the human—whether this is considered to be a historical phenomenon, an ontological shift, and/or a political intervention. Naturecultural thinking has been at work in the humanities and the social sciences, together with relational ontologies that engage with the material world less from the perspective of defined "objects" and "subjects" but as composed of knots of relations involving humans, nonhumans, and physical entanglements of matter and meaning (Barad 2007). Naturecultural thought is also invoked to name a strand of thought in the social studies of science and technology. As we saw in chapter 1, radical constructivist approaches in this field—actor-network theory, in particular—questioned the existence of such thing as "the social" to bring attention to concrete practices of world-making in which agency is distributed between actors that are not only human (or to include objects as agents in the production of sociability). Naturecultural visions in this context also challenge epistemic bifurcations of nature and share with sociotechnical imaginaries a shift of attention to nonhuman ways of life and an awareness of the ontological connectedness between multiple agencies and entities. They "dis-objectify" nonhuman worlds by exposing their liveliness and agency; they "de-subjectify" the human by trying to think of it as a form of ontological agency among others. As such, they promote a mode of attention that resists falling automatically into the "human" perspective.

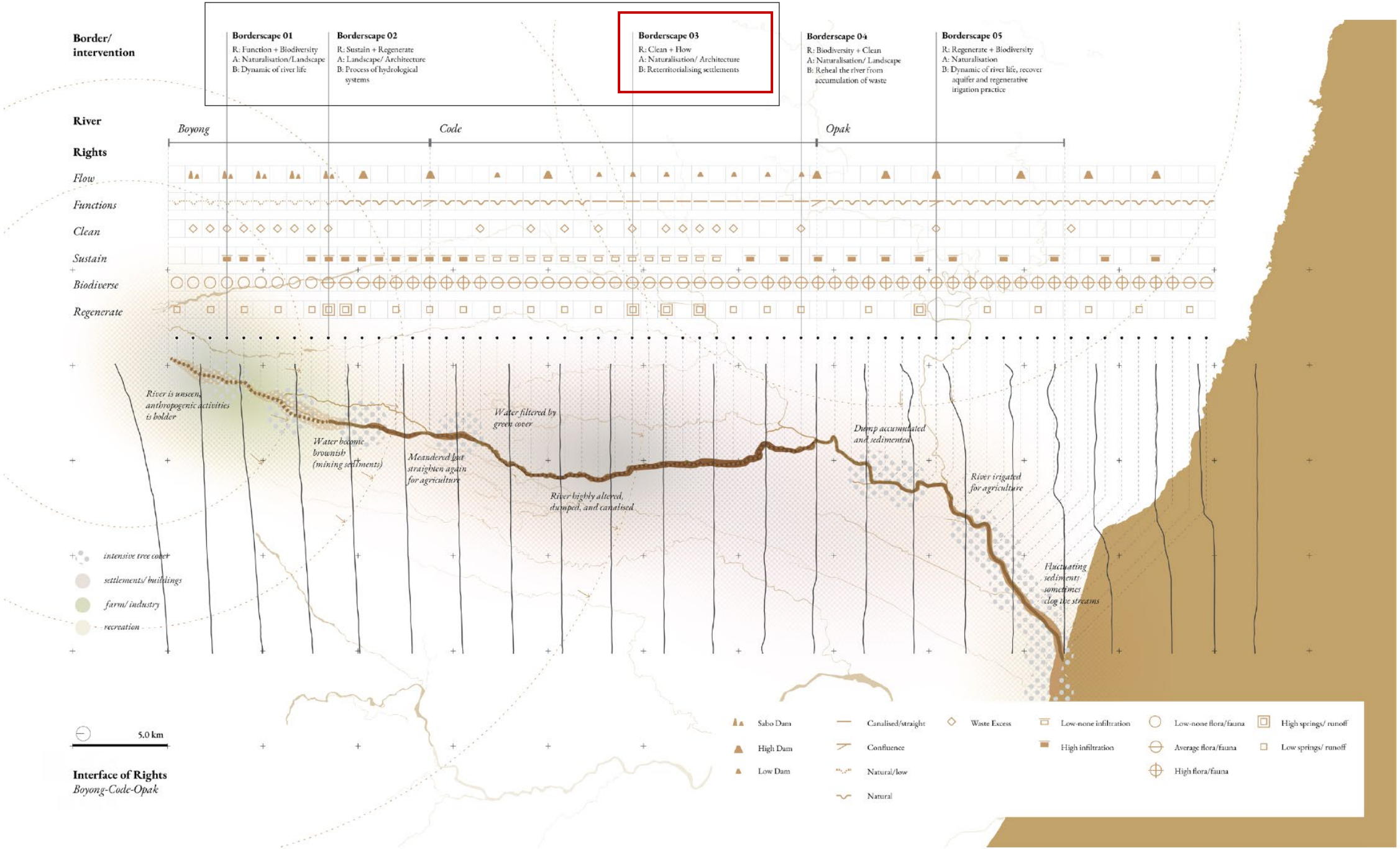
decentering ethics
(Bellacasa, 2017)

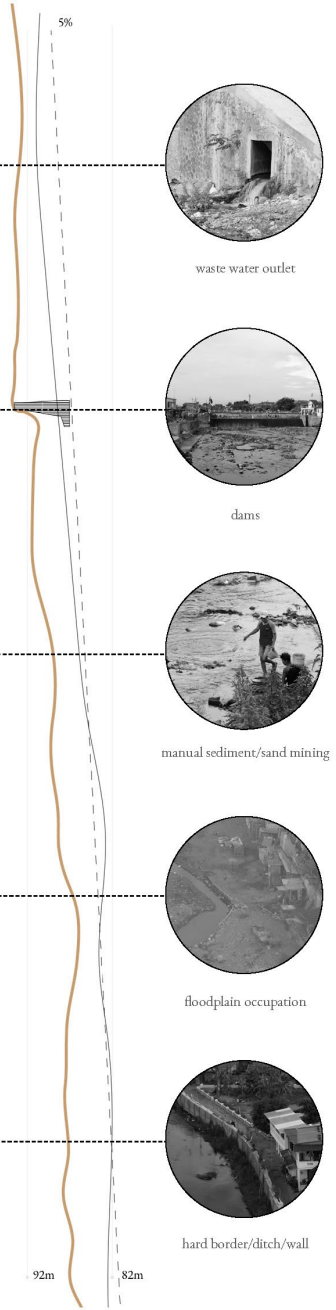


← Pranata Mangsa in the Gregorian calendar. (Zaki et al., 2020)



*refer to territory climatic dataset


Border/ intervention
Borderscape 01
R: Function + Biodiversity
A: Naturalisation/Landscape
B: Dynamic of river life
Borderscape 02
R: Sustain + Regenerate
A: Landscape/ Architecture
B: Process of hydrological systems
Borderscape 03
R: Clean + Flow
A: Naturalisation/ Architecture
B: Reterritorialising settlements
Borderscape 04
R: Biodiversity + Clean
A: Naturalisation/ Landscape
B: Reheal the river from accumulation of waste
Borderscape 05
R: Regenerate + Biodiversity
A: Naturalisation
B: Dynamic of river life, recover aquifer and regenerative irigation practice
River
Boyong
Code
Opak
Rights
Flow
Functions
Clean
Sustain
Biodiverse
Regenerate
River is unseen, anthropogenic activities is bolder
Water become brownish (mining sediments)
Meandered but straighten again for agriculture
Water filtered by green cover
River highly altered, dumped, and canalised
Dump accumulated and sedimented
River irigated for agriculture
Fluctuating sediments sometimes clog the streams
intensive tree cover
settlements/ buildings
farm/ industry
recreation
5.0 km
Interface of Rights
Boyong-Code-Opak
Sabo Dam
High Dam
Low Dam
Canalised/straight
Confluence
Natural/low
Natural
Waste Excess
Low-none infiltration
High infiltration
Low-none flora/fauna
Average flora/fauna
High flora/fauna
High springs/ runoff
Low springs/ runoff



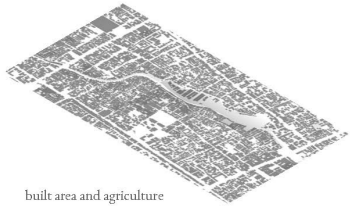
waste water outlet

dams

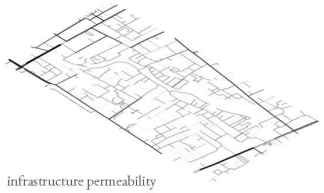
manual sediment/sand mining

floodplain occupation

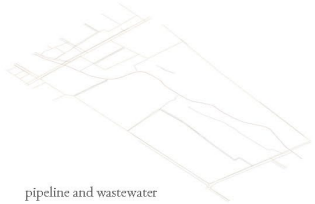
hard border/ditch/wall



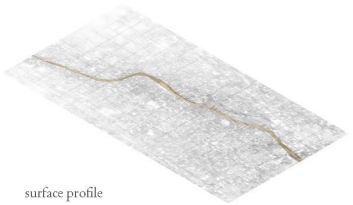
built area and agriculture



infrastructure permeability



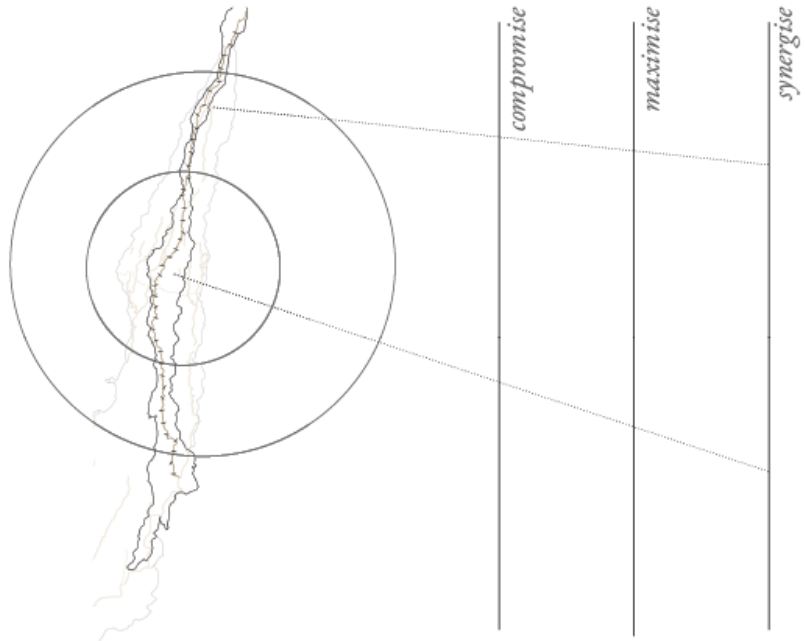
pipeline and wastewater



surface profile

river
middle-low settlements
settlements
agricultural field
path/road
water pipe
waste water pipe
dams

boundary condition



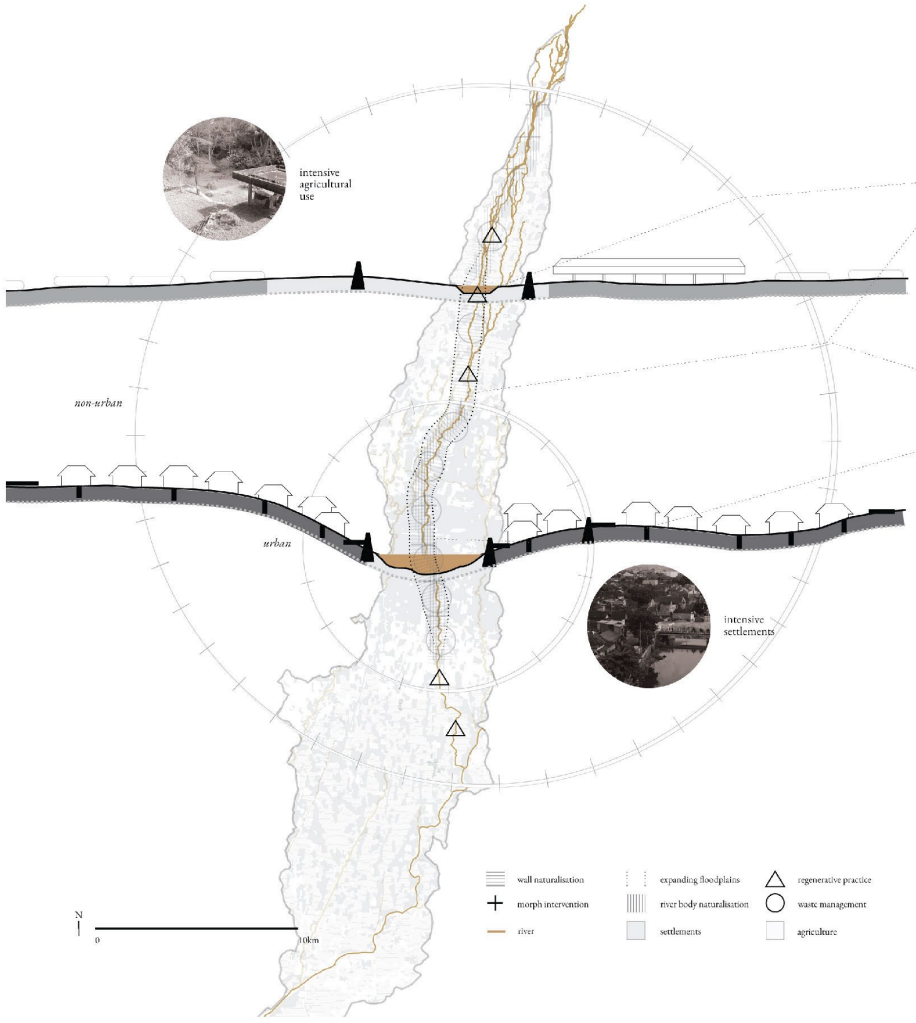
01. put the critical layers and reading on choosen river

02. assemble the designed actions of all actors in the network of time and actions matrix

03. analyse and propose design actions considers the possible further reading

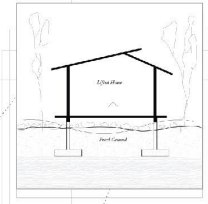
HYDROLOGY MEDIATIONS

rights to regenerate sustainable aquifer



compromise
maximise
synergise
outwards

year 10



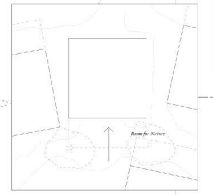
settlements reconstructions
to allow more water absorbed into the aquifer, building should have free space in its ground area

community - care + fund
company - execution
government - fund + policy
visitor - fund

agriculture reconstructions
to allow more water filtered into the river and aquifer, agriculture should have regenerative practice to have circular cycle

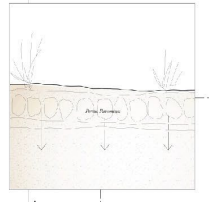
farmers - care + fund
company - execution
government - fund + policy
visitor - fund

year 5



reterritorialising building
with limited space available, it is reccomended to compromise some space as a place for tree to grow in a soil-engineered systems

community - care
government - fund + policy



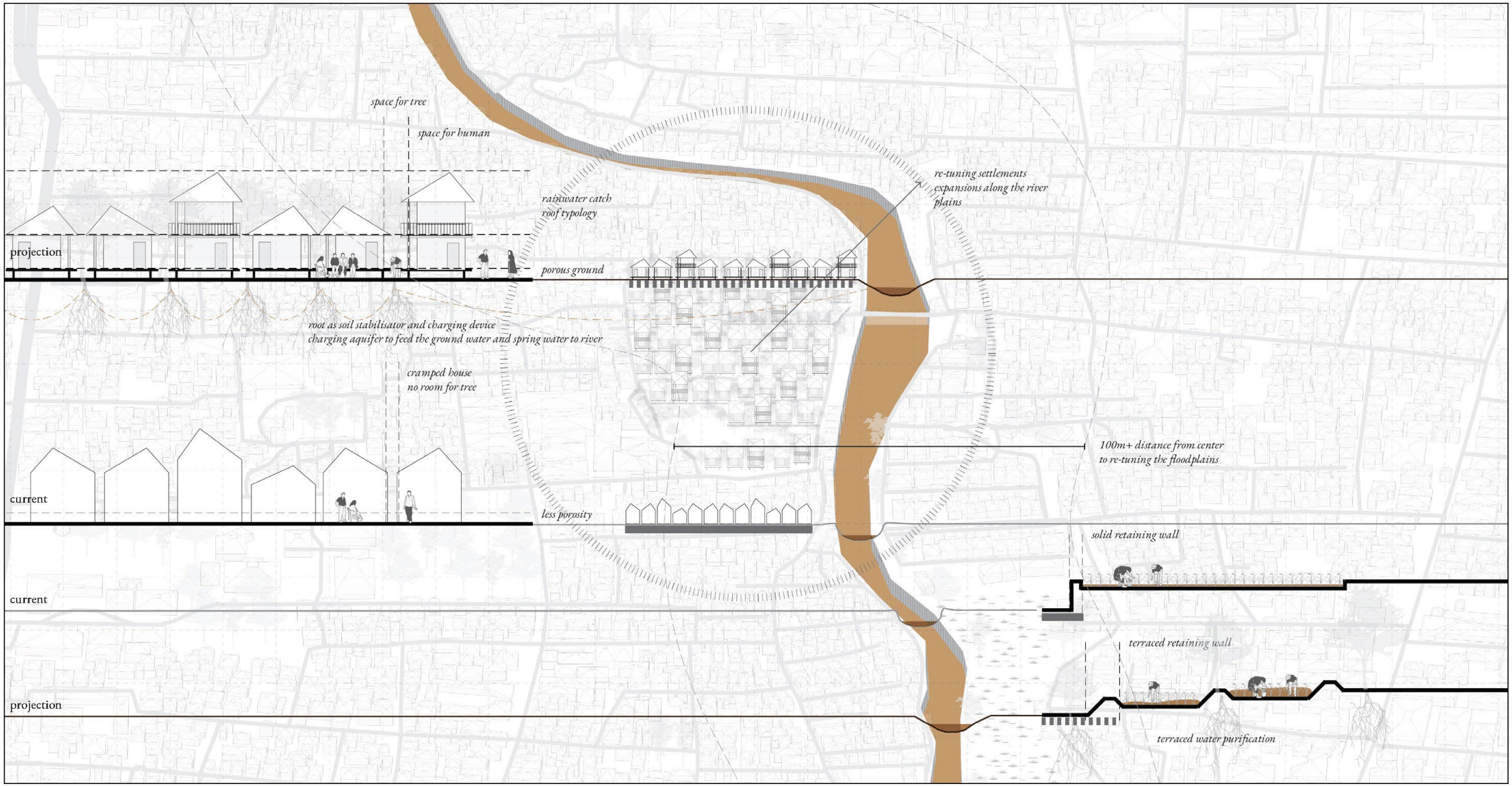
repaving
change solid paving (concrete/asphalt based) into more porous surface, could even work with vegetations or stones

community - care
government - fund + policy

year 1

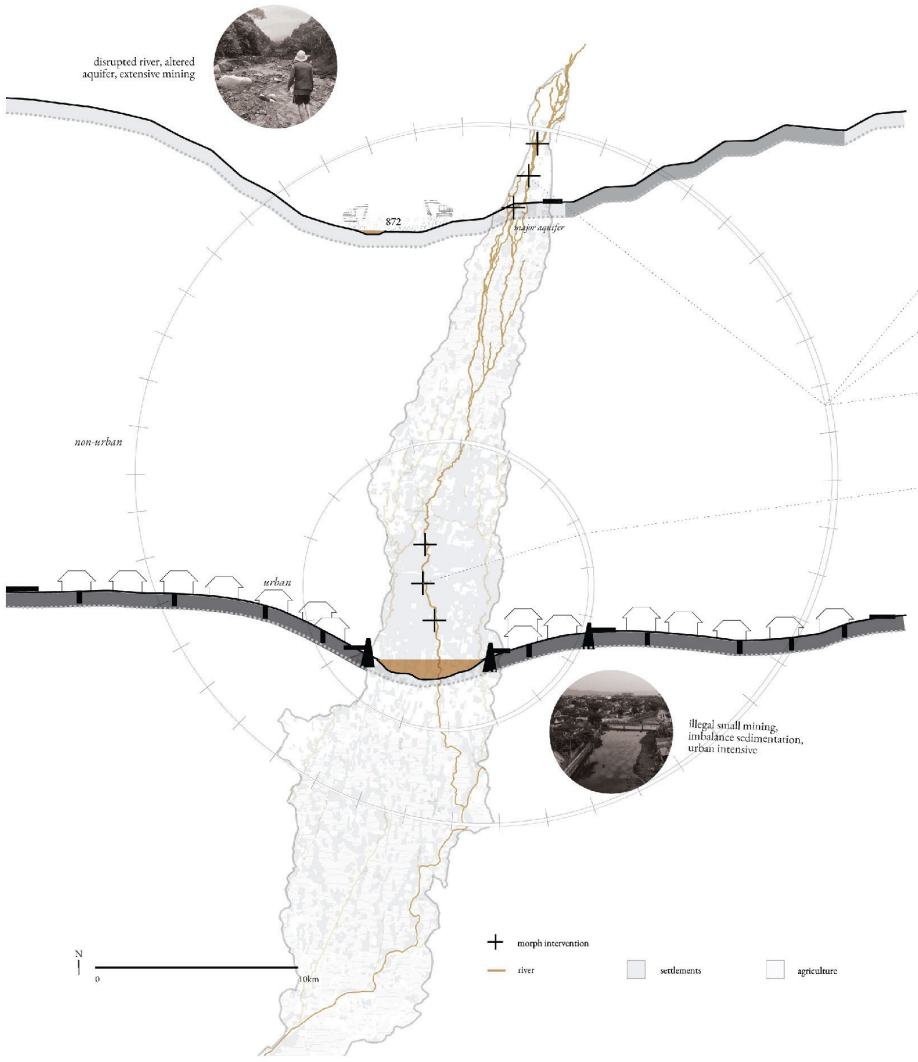
forming stakeholders engagements

year 0


space for tree
space for human
rainwater catch
roof typology
re-tuning settlements
expansions along the river
plains
projection
porous ground
root as soil stabilisator and charging device
charging aquifer to feed the ground water and spring water to river
cramped house
no room for tree
100m+ distance from center
to re-tuning the floodplains
current
less porosity
solid retaining wall
current
terraced retaining wall
projection
terraced water purification
N
m
0
25
50
100
jan
feb
mar
apr
may
jun
jul
aug
sep
oct
nov
dec

RESTORE THE FLOW

rights to flow



compromise

maximise

synergise

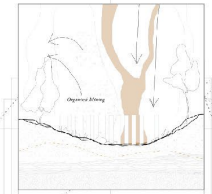
onwards

year 10

year 5

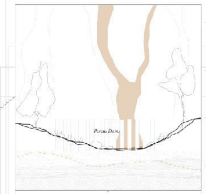
year 1

year 0



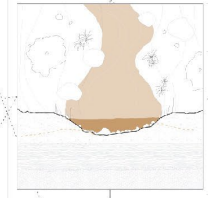
organised sand-mining
as the sediment will refill periodically, organised extraction is required to maintain the ecological and supply-demand stabilisation

government - policy
company-community - care extraction



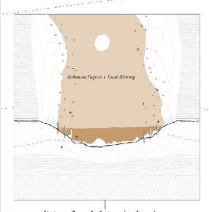
naturalising dams
to restore the natural floodplain in non-urban especially in the volcanic sediment deposit, we need to project the spatial limits to protect the area

company- execution
government - fund + policy
visitor - fund
community - care



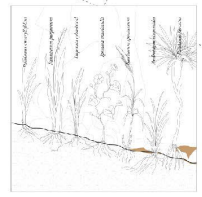
naturalising floodplains (non-urban)
to restore the natural floodplain in non-urban especially in the volcanic sediment deposit, we need to project the spatial limits to protect the area

community - execution
government - fund + policy
visitor - fund



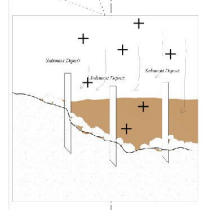
naturalising floodplains (urban)
to restore the natural floodplain in urbanised area we need to create rooms for commoning deposit and sediment as ecological process

community - execution
government - fund + policy
visitor - fund



biodiversity nourishment
as a collective practice, government need to collaborate with community to enrich and protect its riparian vegetation variations

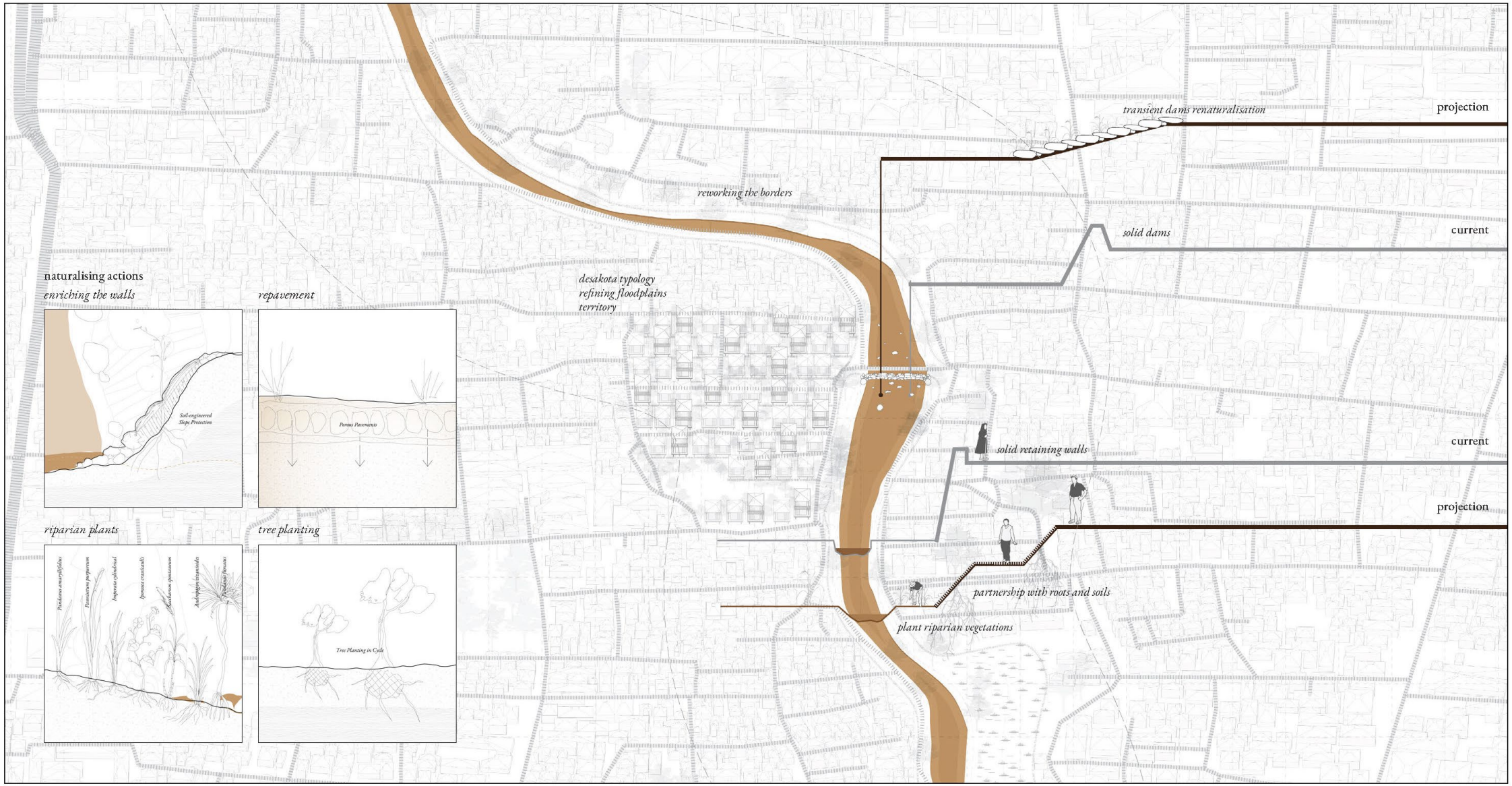
community - execution
government - fund + policy
visitor - fund



sediment catcher
maintaining the balanced amount of sedimentation and erotion demands individual actions to collect the sediment as a resource instead of massive sand-mining

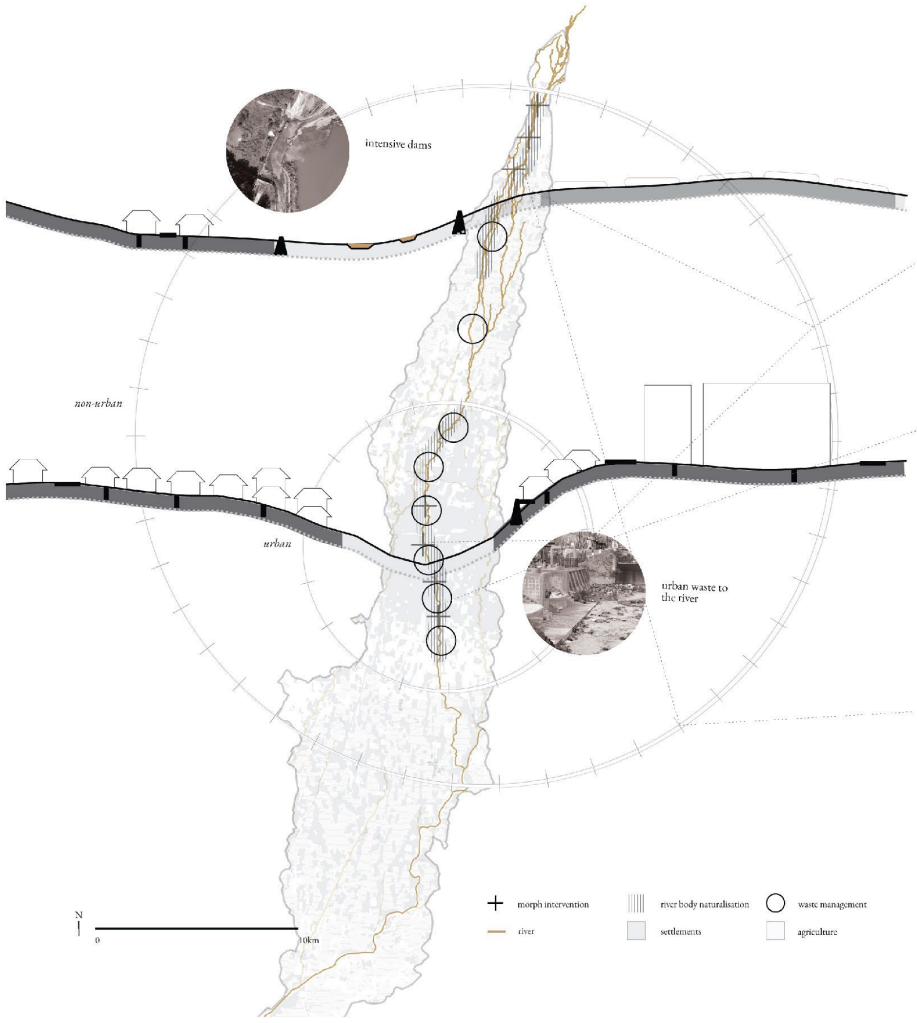
community - care extraction
government - fund + policy

forming stakeholders engagements


transient dams renaturalisation
projection
reworking the borders
solid dams
current
desakota typology
refining floodplains
territory
naturalising actions
enriching the walls
repavement
Soil-engineered Slope Protection
Porous Pavements
solid retaining walls
current
projection
riparian plants
tree planting
Pandanus amaryllifolius
Pennisetum purpureum
Impomea cylindrical
Ipomea crassicaulis
Saccharum spontaneum
Andropogon gayanus
Pandanus furcatus
Tree Planting in Cycle
partnership with roots and soils
plant riparian vegetations
N
m
0
25
50
100
jan
feb
mar
apr
may
jun
jul
aug
sep
oct
nov
dec

QUALITY RIPARIAN LANDSCAPE

rights to have clean water and free from pollutions



compromise
maximise
synergise
onwards
year 10
year 5
year 1
year 0

naturalising the dams and weirs
human interventions which alter the flows should be redefined with flow and ecosystems in minds

community - care
company - execution
government - fund + policy
visitor - fund
animal - care

community waste treatment
rebuild the waste management from ground-up will be a long-term project with a clear goal, waste should be purified before clearing to the earth

community - care
company - execution
government - fund + policy
visitor - fund

agriculture purification
agriculture sector use flow water from river to maintain the systems within and often produce chemical waste, reworking water flow based on its topographical and water systems is a must

farmers - care
government - fund + policy
visitor - fund

build more reservoir
instead of relying the river water only, we should build more reservoir to farm rainwater, which also can feed the river

community - execution, care
government - fund + policy
visitor - fund

waste trap
trap and collect waste that flows in the river

community - execution, care
government - fund + policy
visitor - fund

forming, stakeholders engagements

1st
individual waste filtration

2nd
community waste filtration

3rd
natural filtration

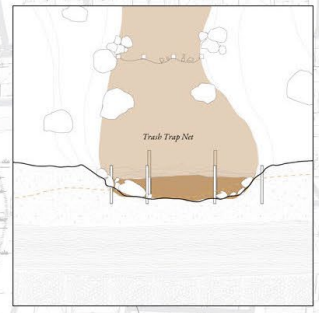
communal waste treatment

multilayer waste treatments

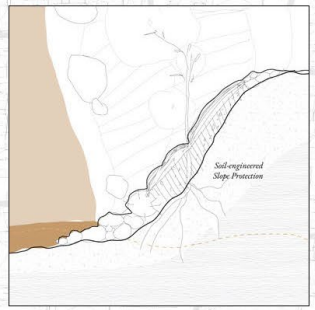
maintaining waste trap

naturalising actions

waste trap



enriching the walls



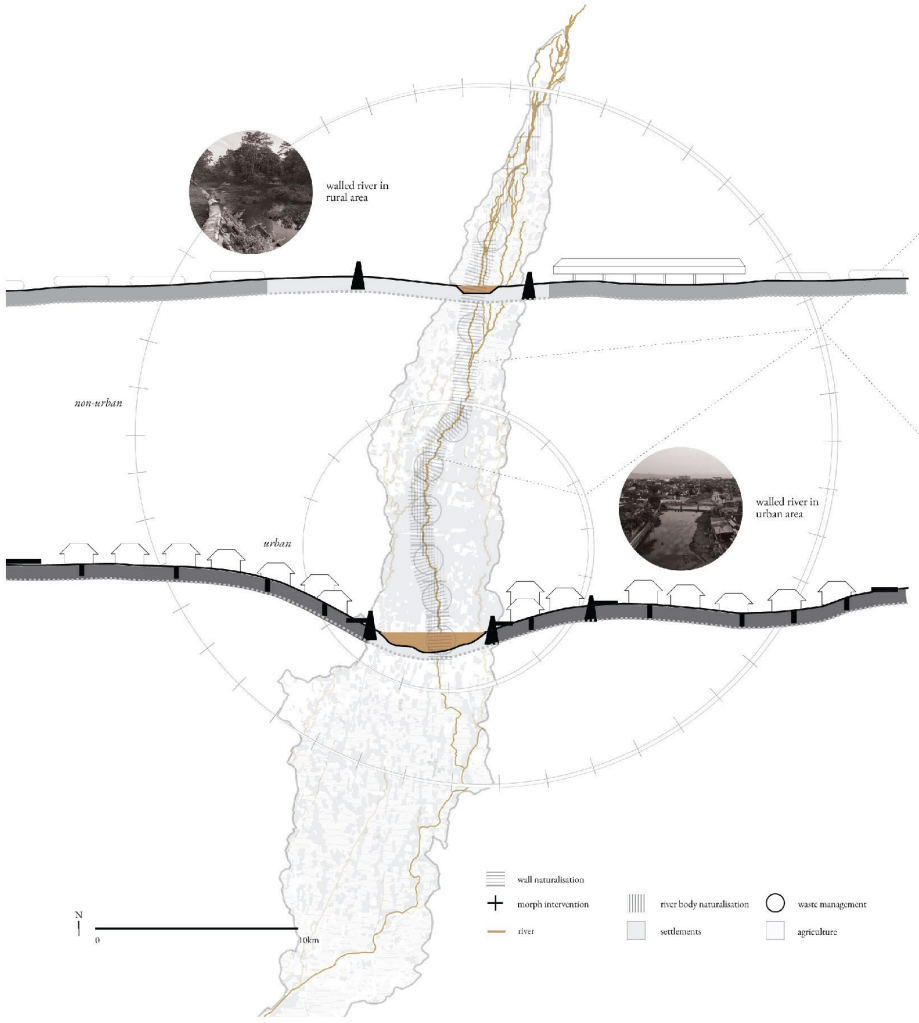
N

0 25 50 m 100

jan feb mar apr may jun jul aug sep oct nov dec

ROOM FOR ECOSYSTEMS

rights to have biodiversity



compromise — maximise — synergise — onwards

year 10

naturalising the wall
to restore the natural border between land and water, reconstruct the solid wall is required. adapting through bio-engineering methods, combining values from soil, plants, and human technology. (Adapted from Patt et al., 1999)

community - care
company - execution
government - fund + policy
visitor - fund
animal - care

year 5

tree planting
as a collective practice, government need to collaborate with community to enrich and protect its vegetation variations

community - execution
government - fund + policy
visitor - fund

fish-accessible dams
fish route is blocked by dams, therefore, integrating tunnel inside the dams allows fish to move and migrate in the river (adapted from Wasser, 2000)

community - care
government - fund + policy
animal - care

year 1

embedding functions
bio-engineered retention walls allows to generate more biodiversity such as animal hotel

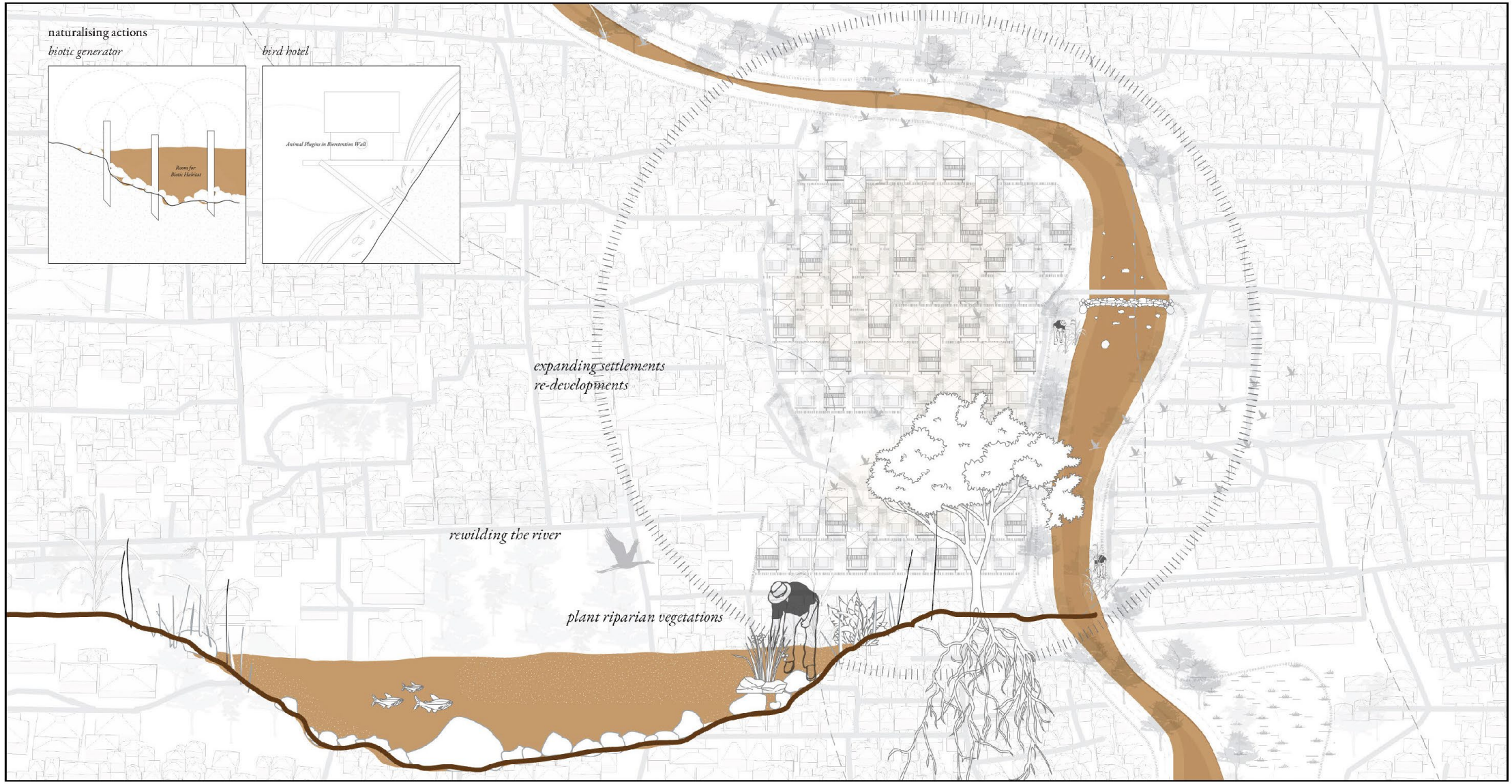
community - care
government - fund + policy
animal - care

biotic accupuncture
maintaining the balanced ecosystems require the roles of biotic actors from fish and animal

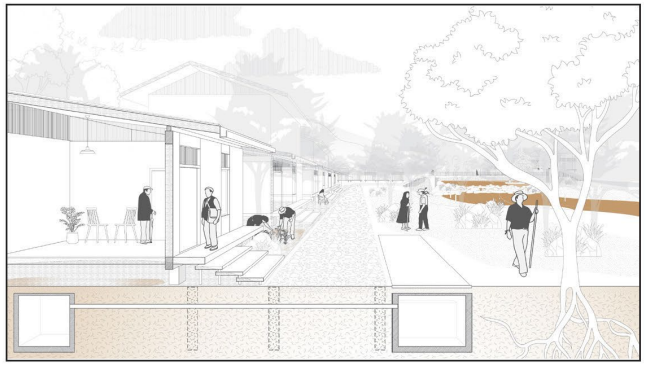
community - care
government - fund + policy
animal - care

year 0

forming stakeholders engagements

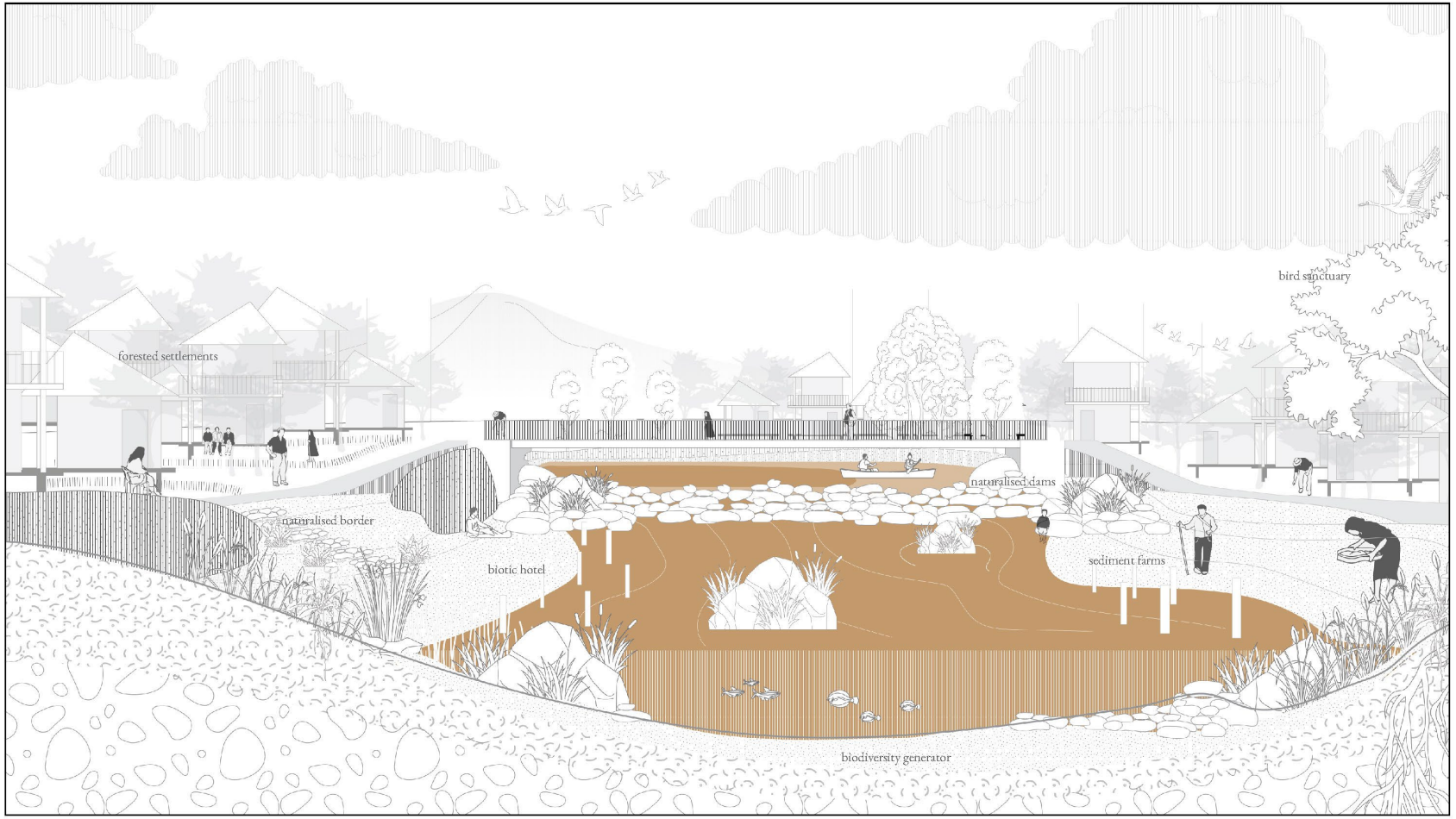

naturalising actions
biotic generator
bird hotel
Room for Biotic Habitat
Animal Plugins in Bioretention Wall
expanding settlements
re-developments
rewilding the river
plant riparian vegetations
N
0
25
50
100
m
jan
feb
mat
apr
may
jun
jul
aug
sep
oct
nov
dec

1. After years of renaturalisation, finally we can see the river as a whole in urbanised area of Yogyakarta where we can play and hear the waterflows freely without boundaries.

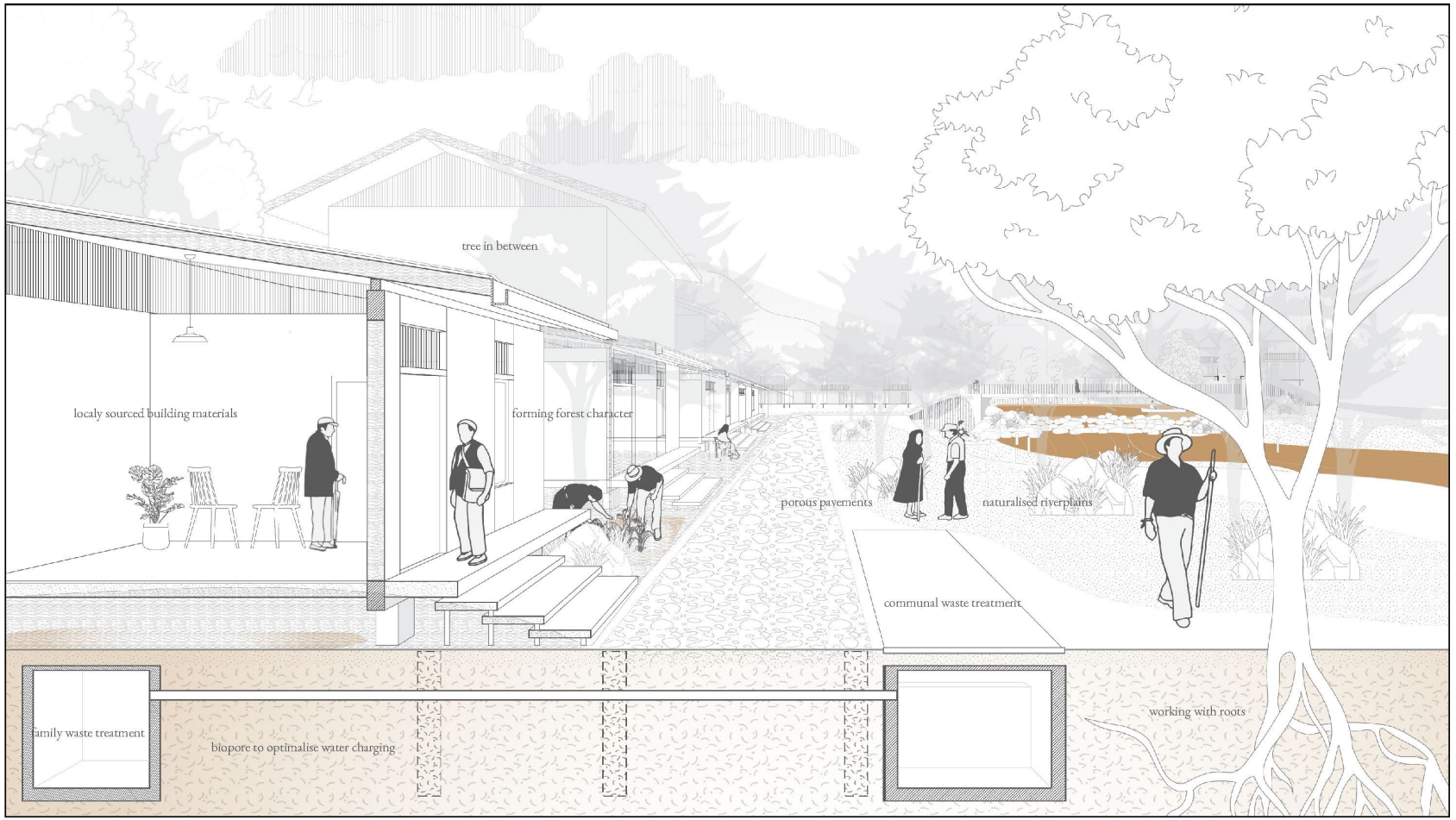


2. Forming settlements grounded guidelines to have more water-sensitive buildings will protect the river with cleaner and more groundwater in its aquifer.

3. Agriculture practices can also help to maintain the river ecosystems by circulating the water on the terraced landscapes and making use of most of it while purifying at the same time.



Embedded purpose in the visualised river systems ↓



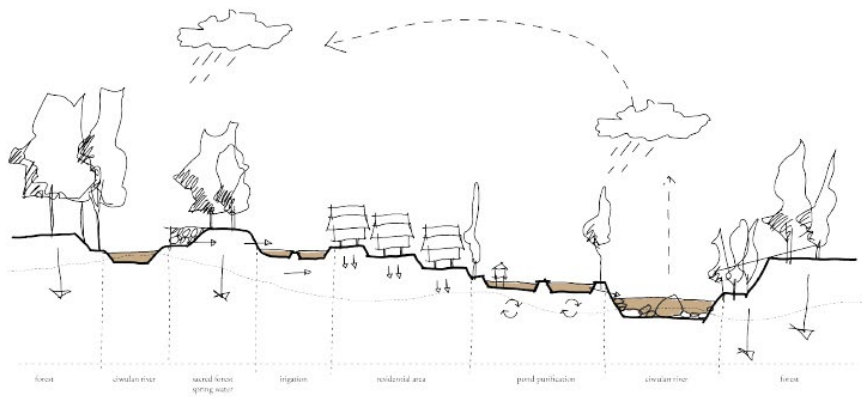
Embedded purpose in the visualised human settlements

Embedded purpose in the visualised agriculture landscape

weaving the actors—collective responsibility

redefining collective
(Bellacasa, 2017)

The "collective" here does not only include humans but the plants we cultivate, the animals we raise and eat (or rather not), and Earth's energetic resources: air, water. It is in connection with these that human and non-human "individuals" live and act. At every level of human subsistence we depend on them—and in these specific contexts of eco-design painfully aware of ecological disruption—*they* are considered as also depending on us. And as such, humans exist only in a web of living co-vulnerabilities.



↑ Water Caring Practice in Kampung Naga

compromise

maximise

synergise

onwards

year 10

year 5

year 1

year 0

government

community

buildings

infrastructures

human

vegetations

biotic

water

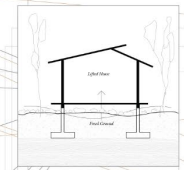
material

river

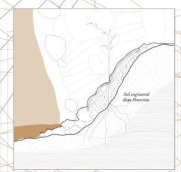
underground

actors

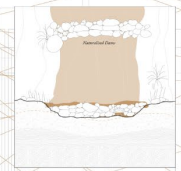
organised sand-mining



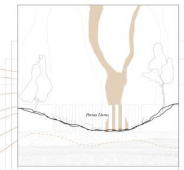
settlements reconstructions



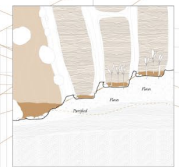
naturalising the wall



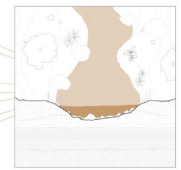
naturalising the dams and weirs



naturalising dams



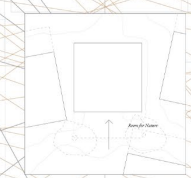
agriculture reconstructions



naturalising floodplains (non-urban)

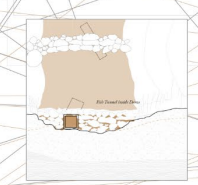
community waste treatment

naturalising floodplains (urban)



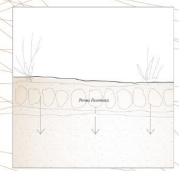
reterritorialising building

tree planting



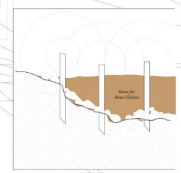
fish-acccessible dams

build more reservoir

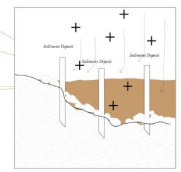


repaving

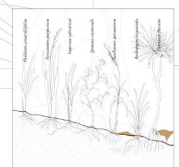
embedding functions



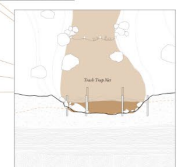
biotic accupuncture



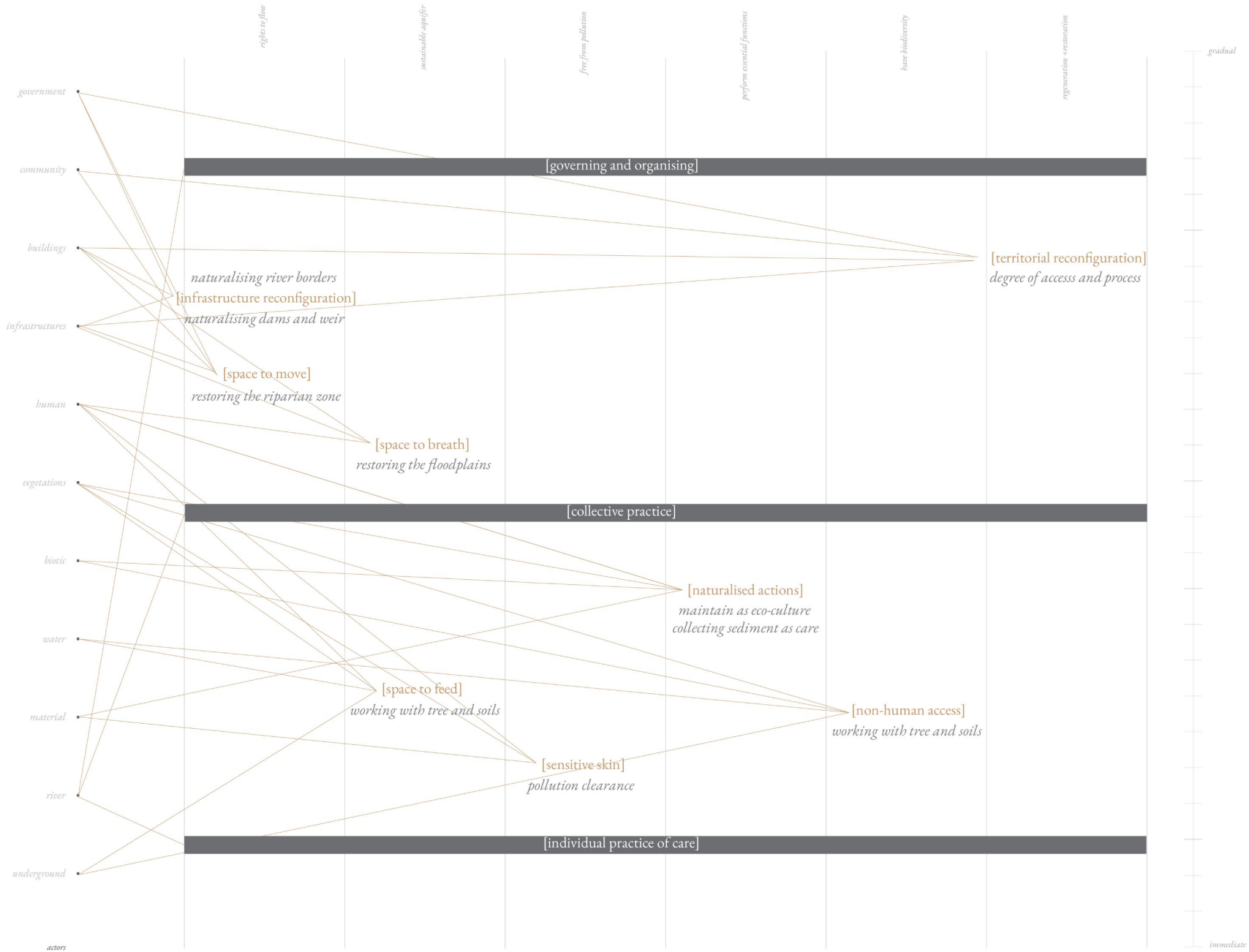
sediment catcher



biodiversity nourishment



waste trap


rights to flow
sustainable aquifer
free from pollution
perform essential functions
have biodiversity
regeneration +restoration
gradual
immediate
government
community
buildings
infrastructures
human
vegetations
biotic
water
material
river
underground
actors
[governing and organising]
[territorial reconfiguration]
degree of accesss and process
naturalising river borders
[infrastructure reconfiguration]
naturalising dams and weir
[space to move]
restoring the riparian zone
[space to breath]
restoring the floodplains
[collective practice]
[naturalised actions]
maintain as eco-culture
collecting sediment as care
[space to feed]
working with tree and soils
[non-human access]
working with tree and soils
[sensitive skin]
pollution clearance
[individual practice of care]

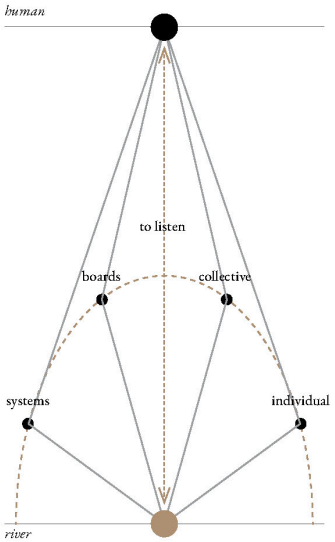
© Paguyuban Kalijawi
Top down-bottom up Aprroach

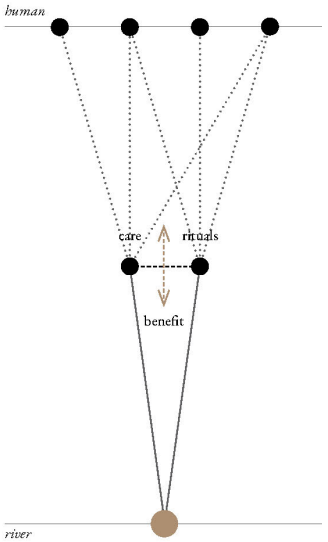
© Dewa Broto, Tribun Jogja
Merti Kali Rituals

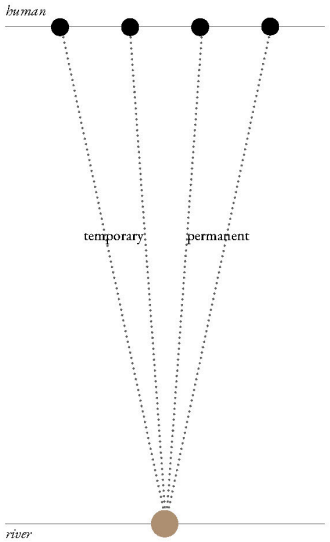
© Aloysius Jarot Nugroho, Antarafoto
Tree Planting on the Riverbank

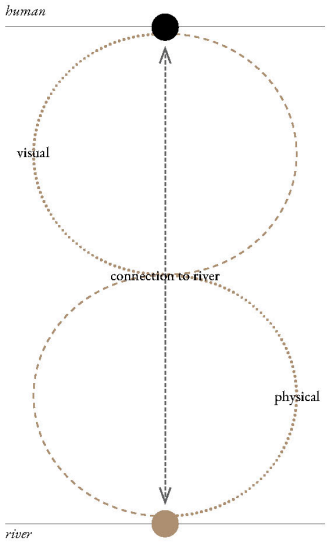
© Flip Putthoff, NWA Online
Natural Dams in Crawford Country

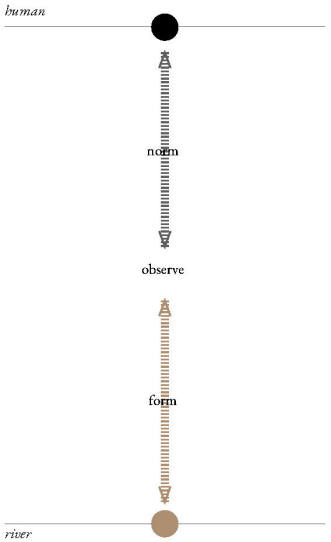
© Satria A. Permana
River and Human Interactions











Governing and Organising

The governance and organisation of resources play a critical role in the practice of commoning, which involves establishing policies and regulations to effectively manage and sustain water and river systems. It is essential to set clear boundaries on human activities that impact the environment. Understanding the interplay between various stakeholders and their actions is crucial for addressing the challenges associated with individual interventions that may influence river conditions.

Collective Practices

The moral and social aspects of nature do not inherently define how they should be maintained and allowed to thrive. It is crucial to recognise that the efforts of just one person cannot achieve the care and preservation of ecosystems. Instead, it requires collective action and a shift towards establishing regular practices that sustain the interconnectedness between humans and the environment.

In the context of rivers, human intervention becomes necessary to maintain the natural flow and prevent the accumulation of non-natural objects and sediment. This underscores the importance of human involvement in preserving the equilibrium of natural systems.

Individual Practice of Care

The concept of care involves engaging in practices that sustain life on a daily basis. It encompasses the ethical considerations associated with our actions and emotions, whether we are permanent residents or just temporary visitors in a particular space. Taking a caring approach involves understanding the interconnectedness of everything around us. When it comes to rivers, individual actions, regardless of their scale, have a significant impact on the health of the river. By collectively recognising the importance of caring for our planet, we can work towards restoring the rivers to their former states.

Infrastructure Reconfiguration

The infrastructure that includes dams, bridges, and weirs has traditionally prioritised serving human needs over the needs of the river itself. However, removing dams is not a straightforward technical or social decision, as noted by Iuorio (2023). It is essential to conduct further assessments to determine whether the existing infrastructure should be maintained, removed, or reconfigured to better meet the needs of both the river and humans. Future infrastructure development should consider the river as a central element, addressing its physical and systemic aspects.

Sensitive Skin

Rivers can have sensitive skin, as any materials that come into contact with them have the potential to alter their composition. While rivers have the natural ability to purify themselves, when exposed to extensive pollution, they become damaged, and the purification process becomes significantly more difficult. To truly appreciate and protect rivers, we need to shift our perspectives and gain a comprehensive understanding of their unique forms and characteristics.

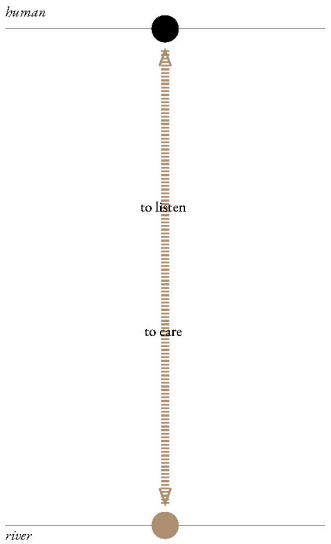
© City of Munich
Isar River before Restoration

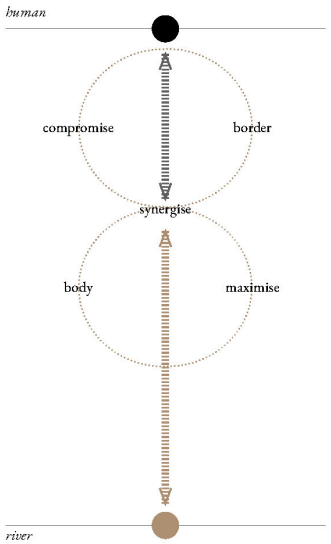
© City of Munich
Isar River After Restoration

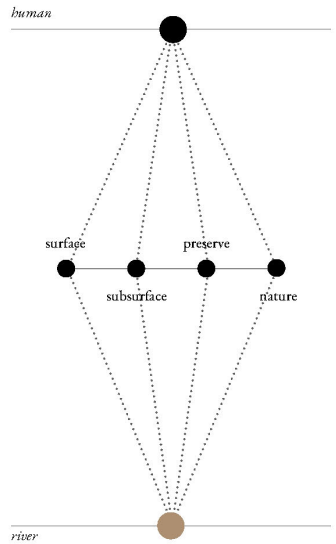
© Satria A. Permana
Preserved Spring Water in Kampung Naga

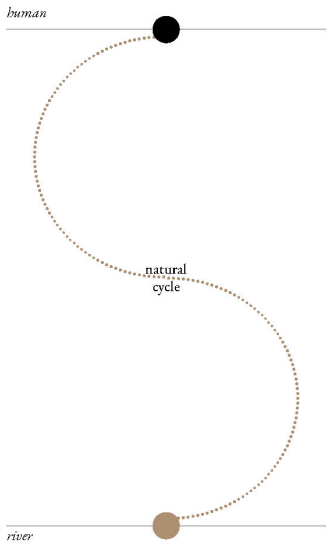
© Satria A. Permana
Spatial Circular Water Management in Naga

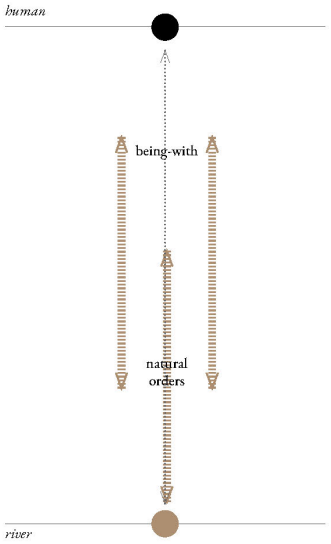
© Satria A. Permana
River and Nonhuman Interactions











Room to Move

It is crucial to recognise that rivers are living entities requiring space to flow freely. To truly understand the dynamic nature of rivers – encompassing hydrology, geomorphology, and ecology – it is essential to take proactive measures to listen to their needs and ensure their well-being. By employing a wide range of strategies to acknowledge and support the natural dynamism of rivers, we can foster a deep cultural and spiritual connection with these vital waterways.

Room to Breath

Rivers, in contrast to the highly regulated ones found in urbanised areas, have a dynamic nature, continuously altering their courses. They feature floodplains, crucial areas where water levels fluctuate, rising during floods and receding during dry periods. These floodplains are essential for the well-being of the river, enabling it to spread out and relieve pressure during high water levels. Rivers carry sediments, nutrients, and living materials, enriching the ecological diversity of the surrounding area. Allowing rivers the space to move naturally is essential for preserving their ecological functions, mitigating flood hazards, and safeguarding biodiversity. This actions underscores the importance of granting rivers room to evolve and uphold their natural processes.

Room to Feed

A river is not just a simple flow of water from one point to another. It is a complex system that encompasses atmospheric and subsurface continuum. When living near a river, it is important for humans to consider the interconnectedness of the ecosystem. Allowing rainwater to naturally permeate the ground not only sustains the river's flow but also helps fulfill our groundwater needs.

Naturalised Actions

Frequently, we attempt to control rivers and adapt them to meet our requirements, whether for agriculture or power generation, which can significantly change their natural flow and volume. At the same time, it is more effortless to dismantle existing infrastructure after it reaches the end of its useful life, especially when current patterns have already been established. However, by reexamining our current methods and incorporating more natural approaches, we can minimise the impact on the environment and restore a balanced relationship with the river while still assembling our needs.

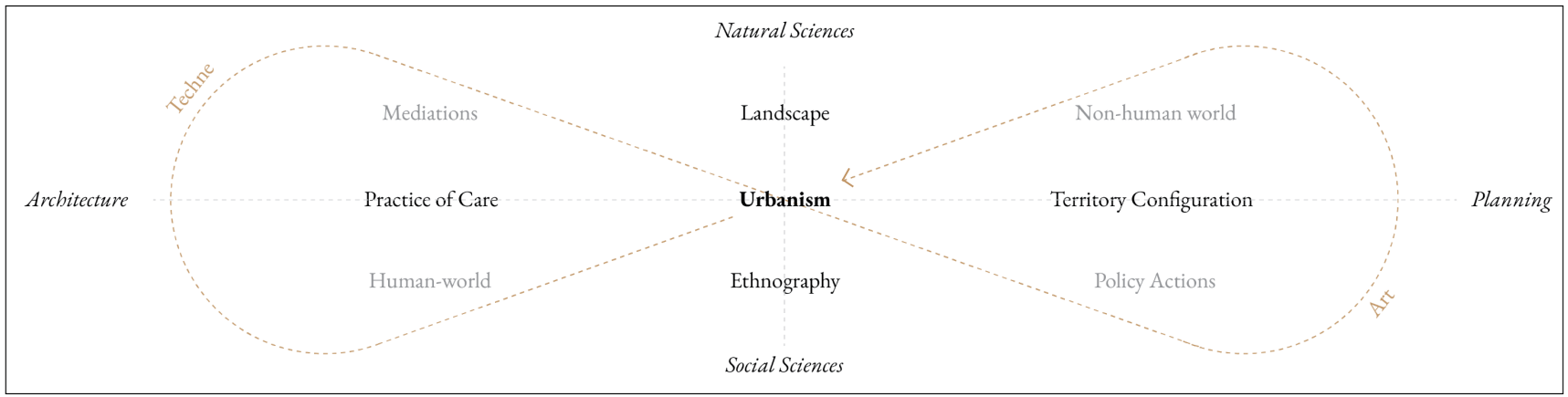
Non-human Access

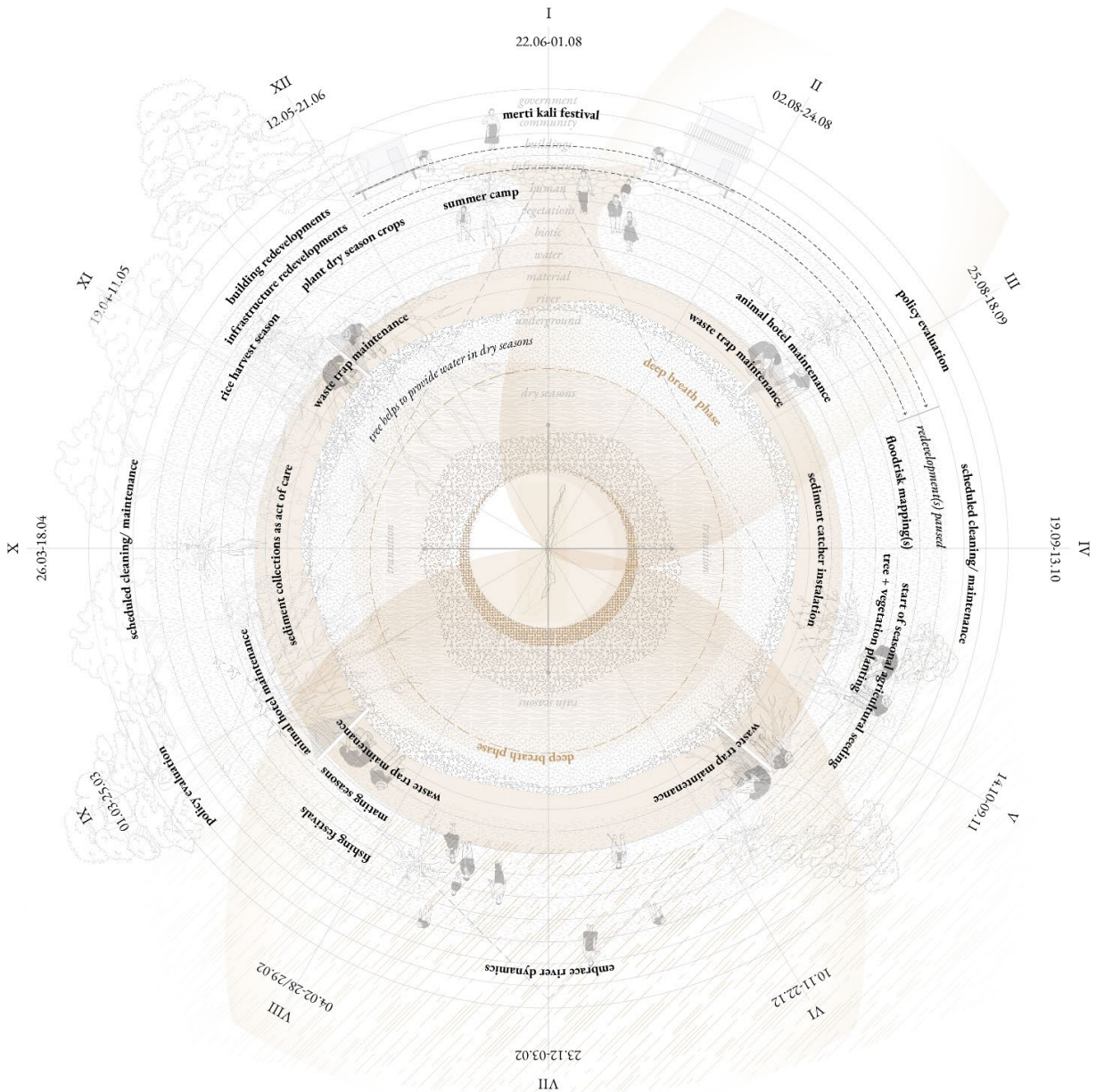
We often overlook the fact that ecosystems have complex cycles in which all beings work together to maintain the natural balance. Ecocentrism calls for us to align ourselves ecologically with the natural orders of the river, enabling greater biodiversity to seamlessly intertwine in this interconnected world. It's essential to make wise choices about the aspects of the ecosystem we can impact and those that are beyond our control.

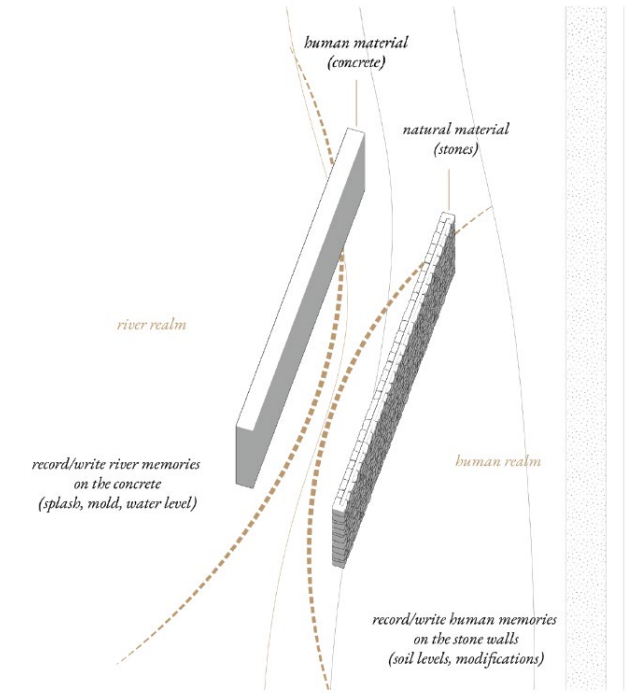
conclusion and evaluations

how do we advocate more-than-human—through design?

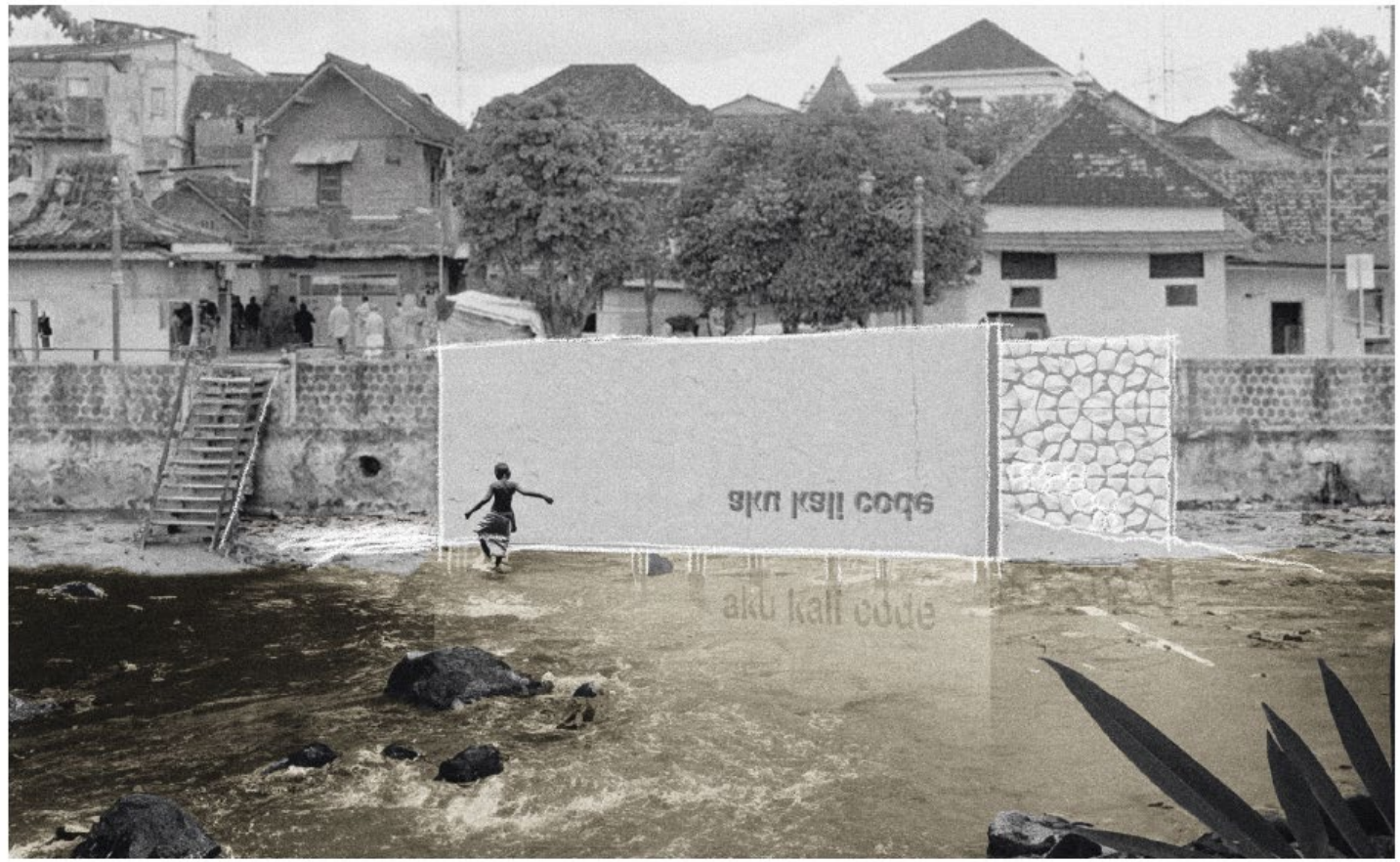
↑
The Giant River, Stream of Memories by Papermoon Puppet Theatre


Natural Sciences
Techne
Mediations
Landscape
Non-human world
Architecture
Practice of Care
Urbanism
Territory Configuration
Planning
Human-world
Ethnography
Policy Actions
Art
Social Sciences


I
22.06-01.08
II
02.08-24.08
III
25.08-18.09
IV
19.09-13.10
V
14.10-09.11
VI
10.11-22.12
VII
23.12-03.02
VIII
04.02-28/29.02
IX
01.03-25.03
X
26.03-18.04
XI
19.04-11.05
XII
12.05-21.06
merti kali festival
summer camp
policy evaluation
redevelopment(s) paused
scheduled cleaning/ maintenance
floodrisk mapping(s)
start of seasonal agricultural seeding
tree + vegetation planting
sediment catcher instalation
waste trap maintenance
animal hotel maintenance
deep breath phase
embrace river dynamics
fishing festivals
waste trap maintenance
animal hotel maintenance
sediment collections as act of care
scheduled cleaning/ maintenance
policy evaluation
matting seasons
building redevelopments
infrastructure redevelopments
plant dry season crops
rice harvest season
waste trap maintenance
tree helps to provide water in dry seasons
deep breath phase
government
community
business
infrastructure
human
vegetations
biotic
water
material
river
underground
dry seasons
rain seasons
creation
creation

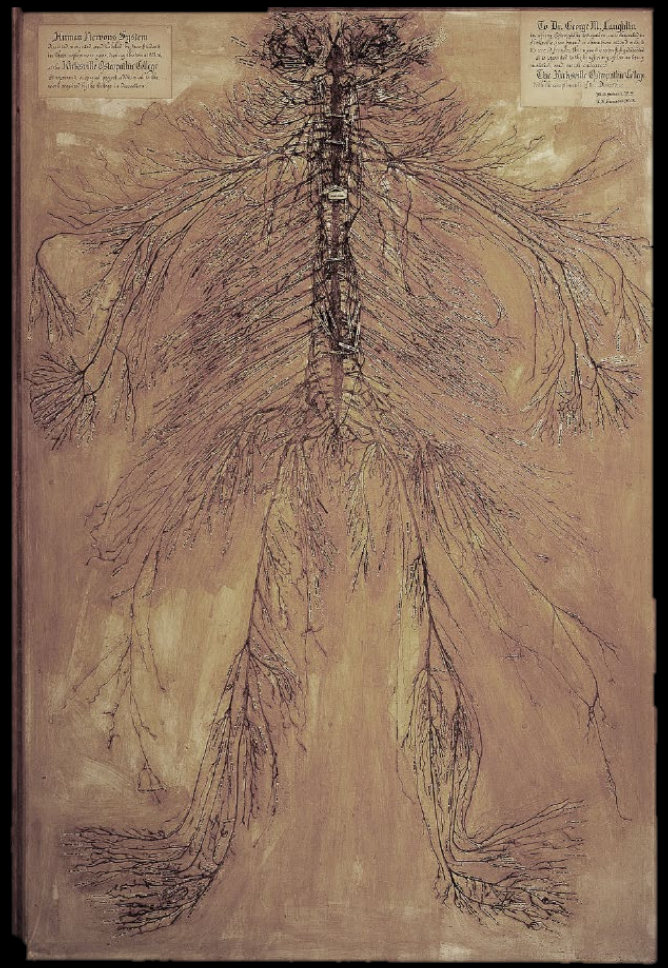


Conceptual drawings of
the river pavilion
↓



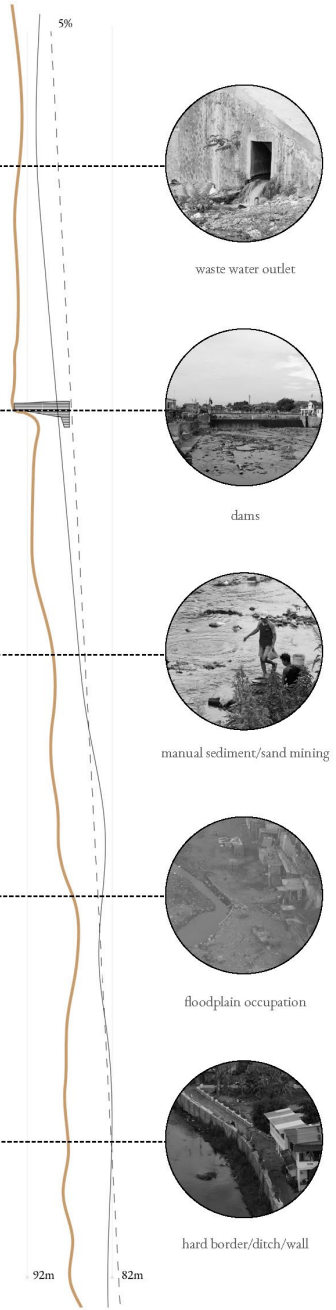
*I am Code River

“Our fatal shortcomings as human beings have been that we treat the earth as just an object”
—Nasaruddin Umar
Grand Imam of Istiqlal Mosque Jakarta
Interview with New York Times 04/17/2024



thank you!

appendix



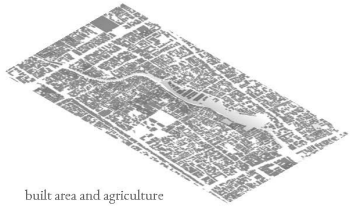
waste water outlet

dams

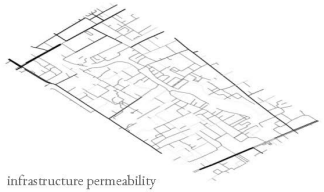
manual sediment/sand mining

floodplain occupation

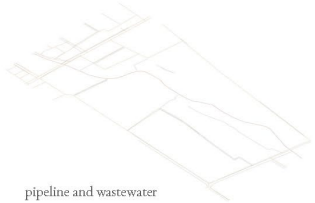
hard border/ditch/wall



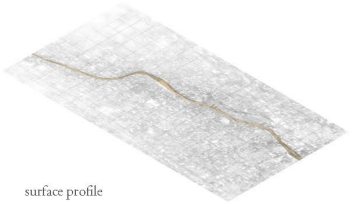
built area and agriculture



infrastructure permeability



pipeline and wastewater



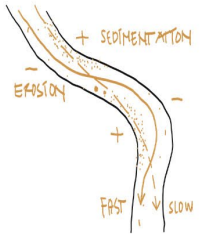
surface profile

river
middle-low settlements
settlements
agricultural field
path/road
water pipe
waste water pipe
dams

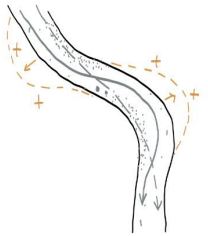
boundary condition

compromise — *room for river*

design actions

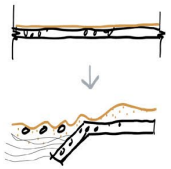


01. understanding the flows

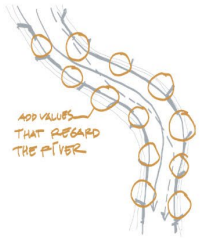


02. more room to balance the flow

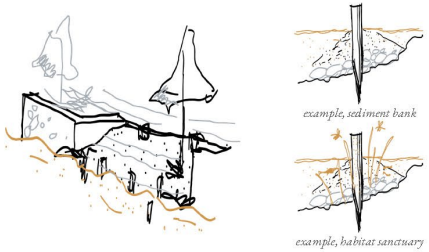
03. reconstructing the borders



04. (detail) rotate and give room



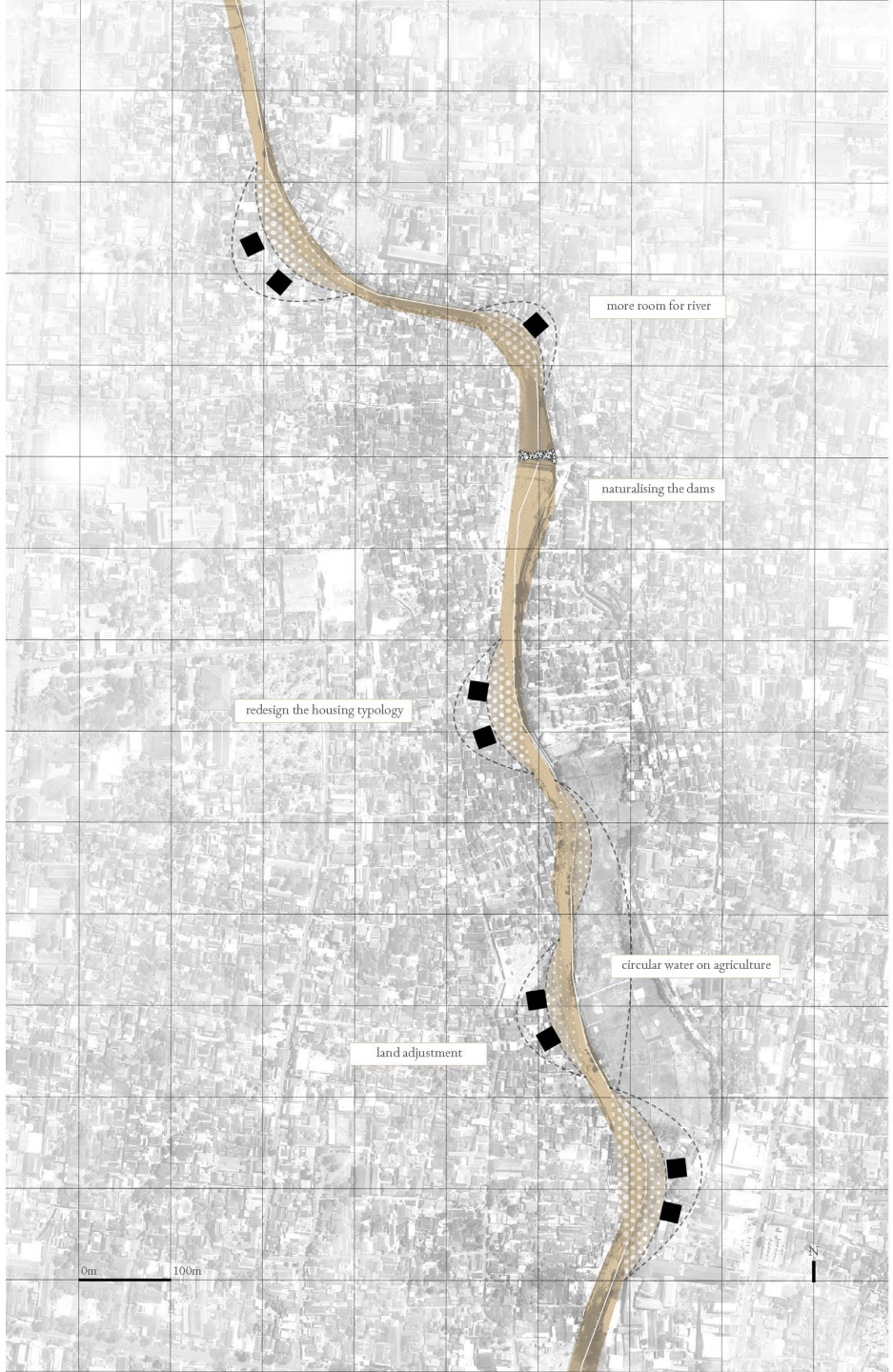
05. add value(s) in the room



06. (options) values for river and human

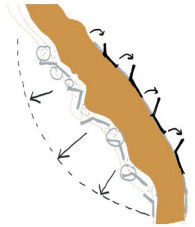
rights agencies
[1] right to flow
[2] right to biodiverse
[3] right to functions

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] increase green spaces

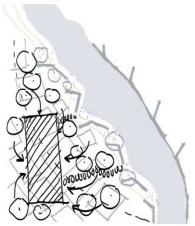


maximise — *more room for river and human*

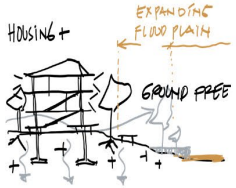
design actions



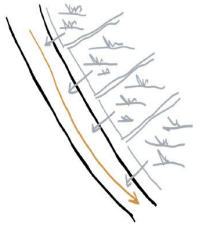
01. extending the river's room



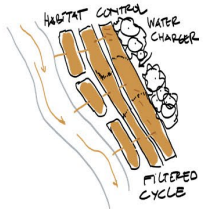
02. land adjustment for settlements



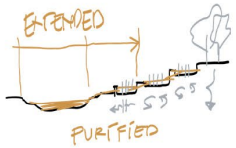
03. adaptive stacked housing typology



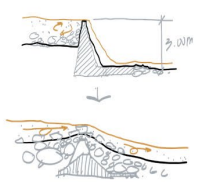
04. borderscaping the agriculture

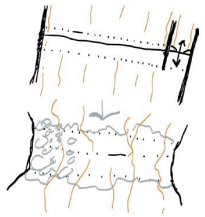


05. applying circular water principle



06. extended river,
fed with purified water





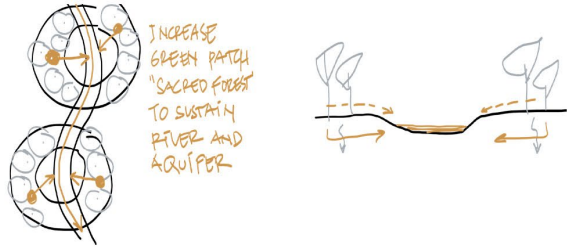
07. naturalising the dams

rights agencies
[1] right to flow
[2] right to biodiverse
[3] right to functions
[4] right to fed and sustain
[5] right to have clean water

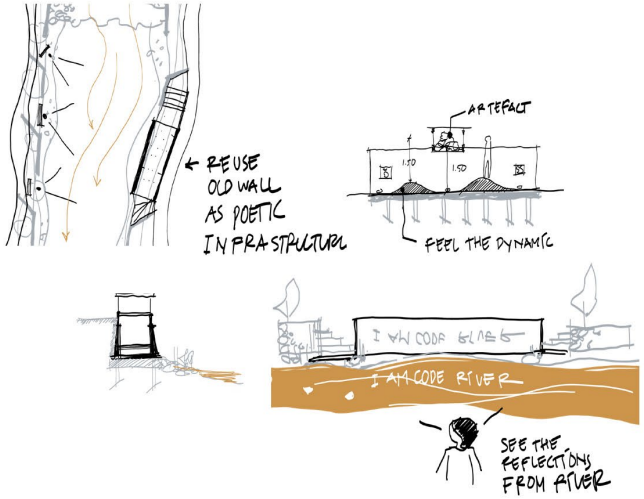
systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] increase green spaces
[4] increase water charge area

synergise — ***a border to remember***

design actions



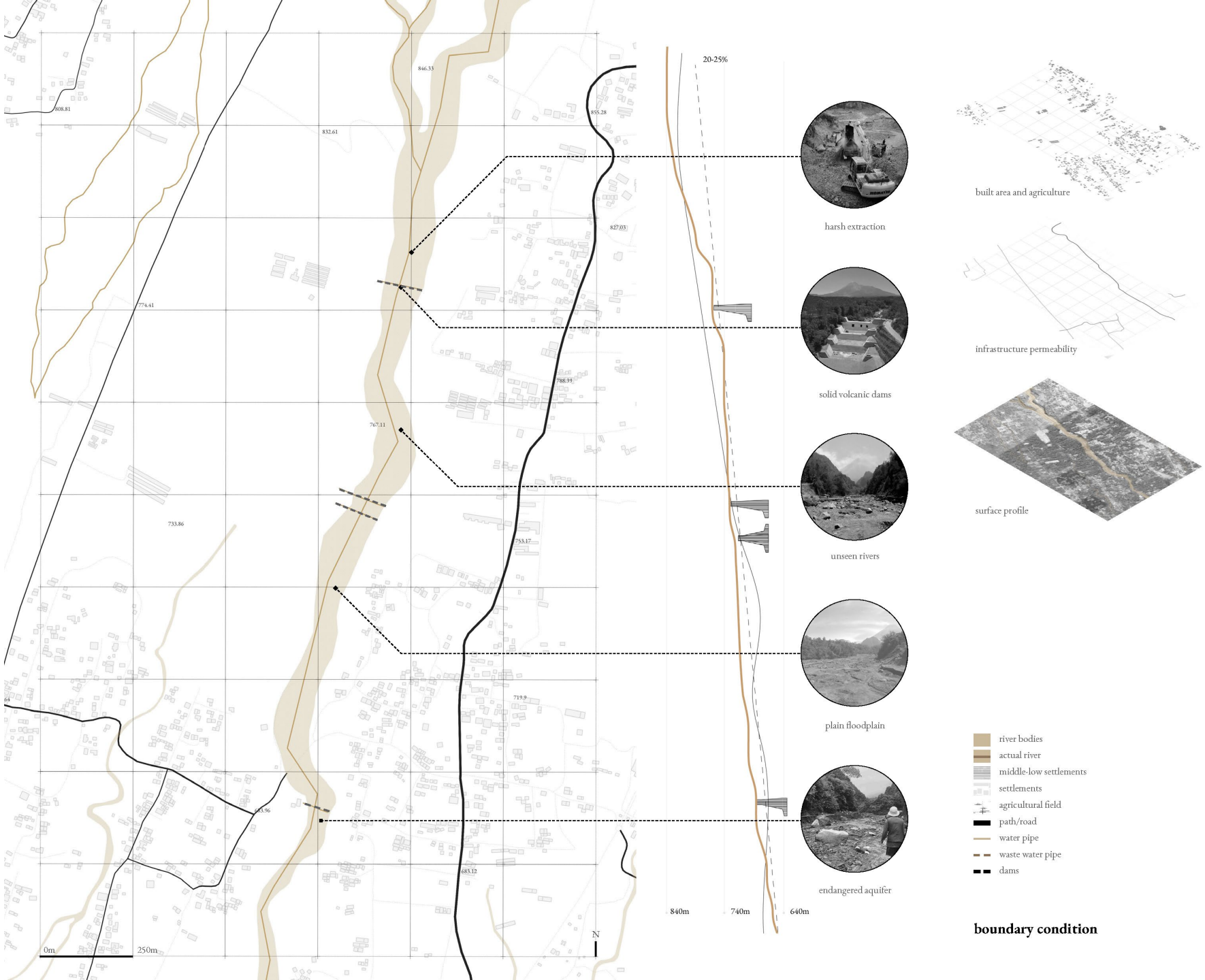
01. extending the green patch with sacred forest typology



02. poetic infrastructure to establish dialogue of care

rights agencies
[1] right to flow
[2] right to biodiverse
[3] right to functions
[4] right to fed and sustain
[5] right to have clean water

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] increase green spaces
[4] increase water charge area
[5] increase human awareness of river as subject



built area and agriculture

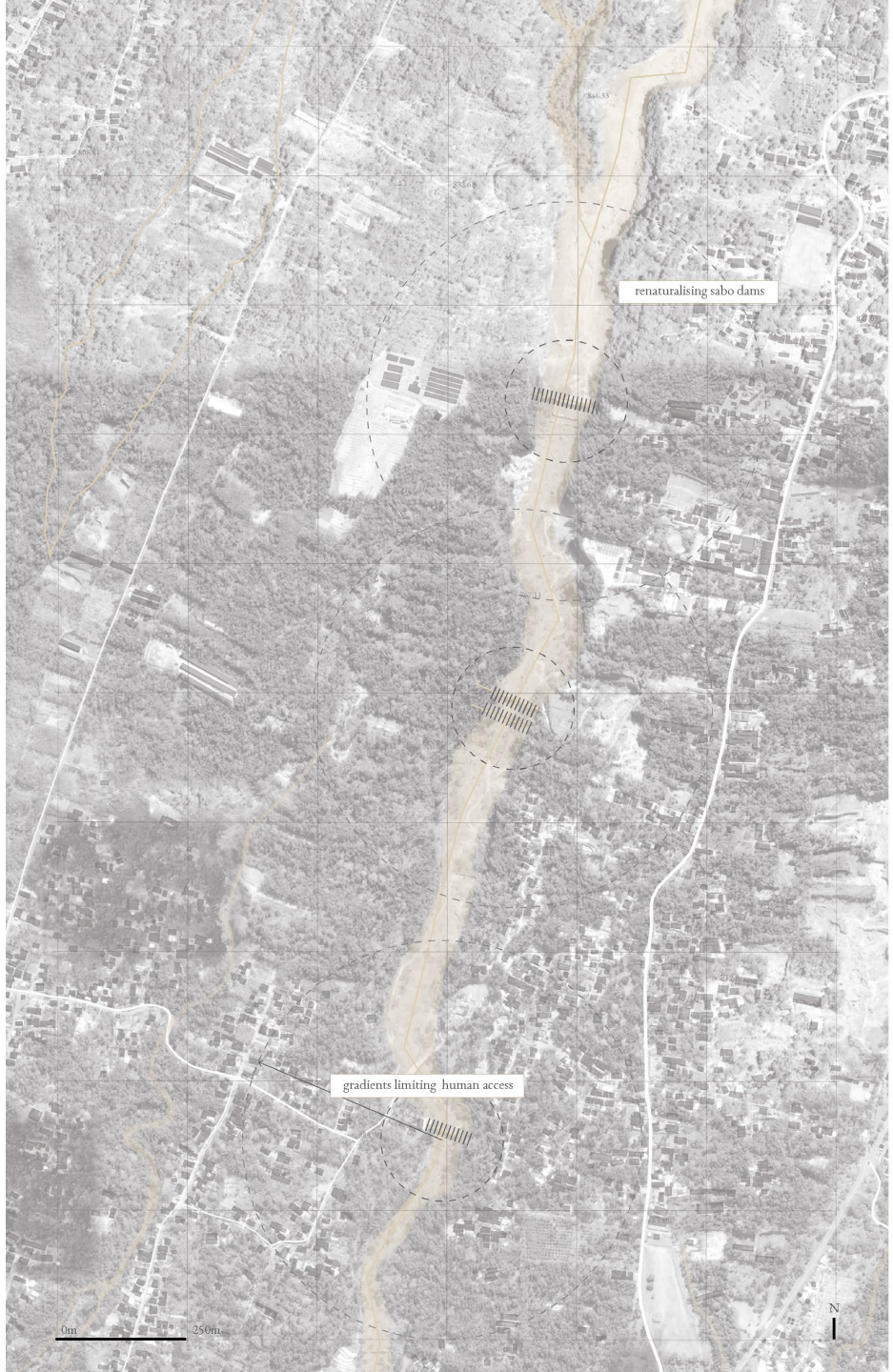
infrastructure permeability

surface profile

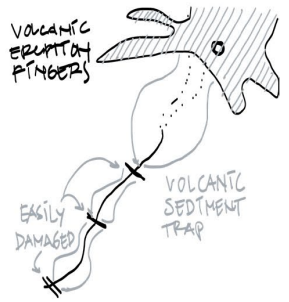
river bodies
actual river
middle-low settlements
settlements
agricultural field
path/road
water pipe
waste water pipe
dams

boundary condition

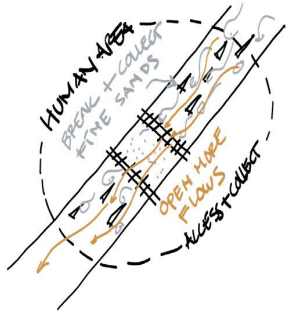
compromise — *room for river*



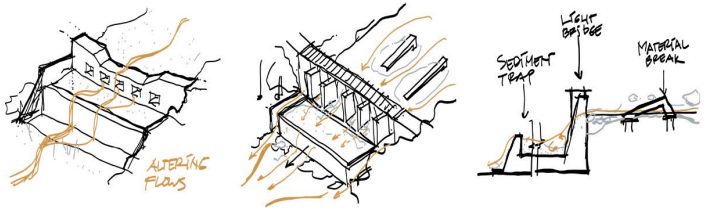
design actions



01. understanding the nature



02. territorialising the dams



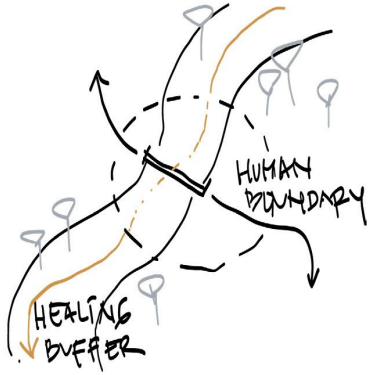
03. renaturalising the dams

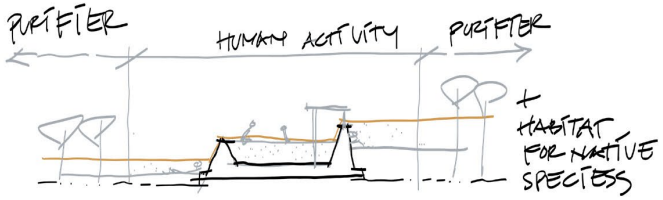
rights agencies
[1] right to flow
[2] right to have clean water
[3] right to functions

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] work with natural forces

maximise — *healing the aquifer*

design actions

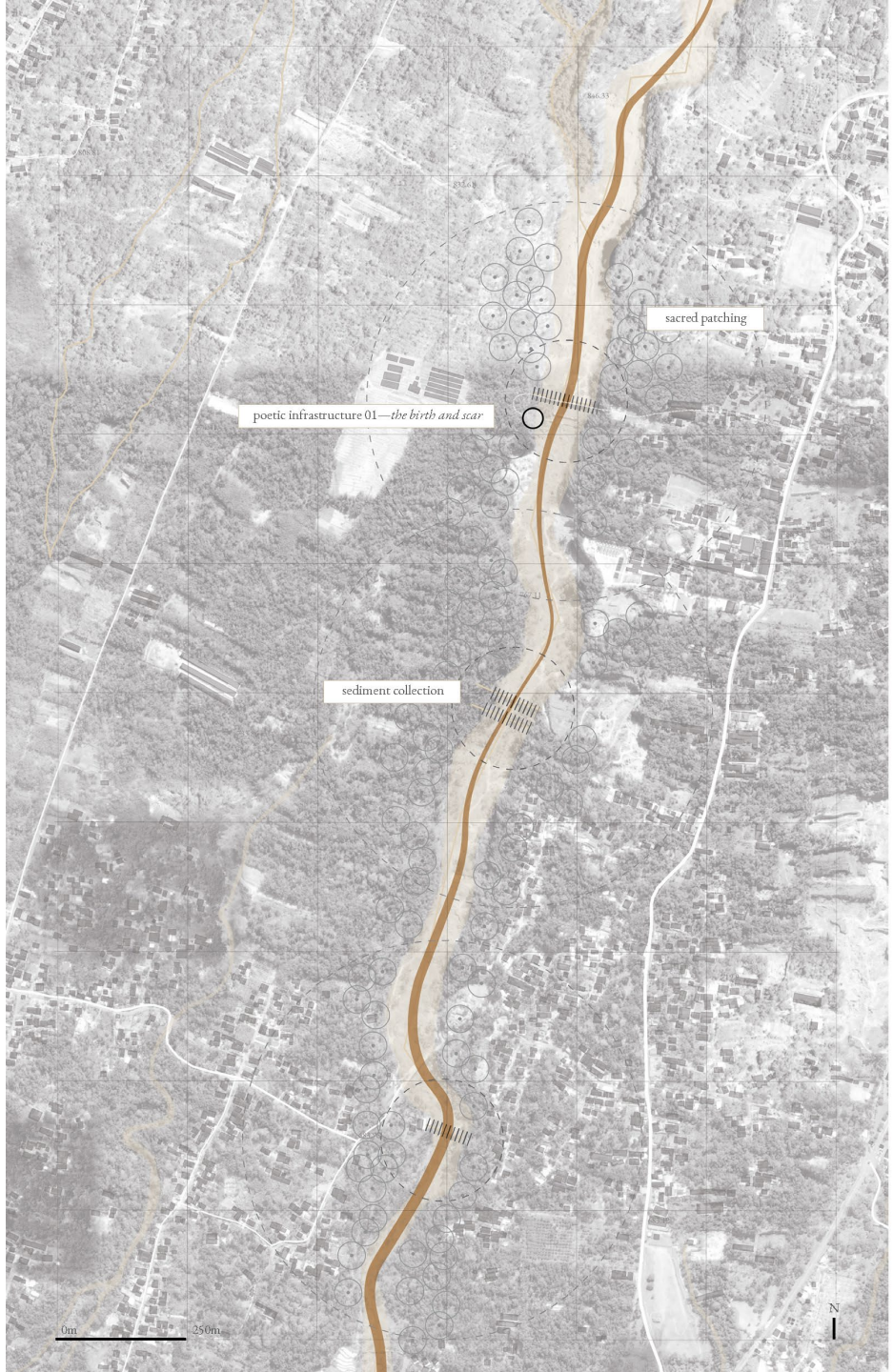




01. designating healing buffer

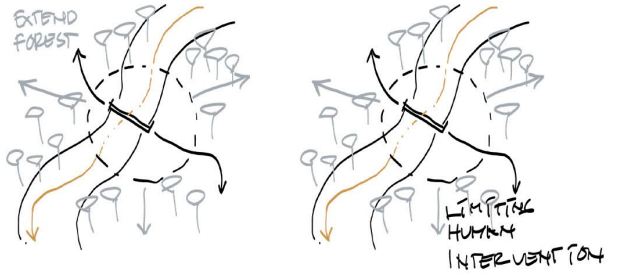
rights agencies
[1] right to flow
[2] right to have clean water
[3] right to functions
[4] right to biodiverse
[5] right to be sustain

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] work with natural forces

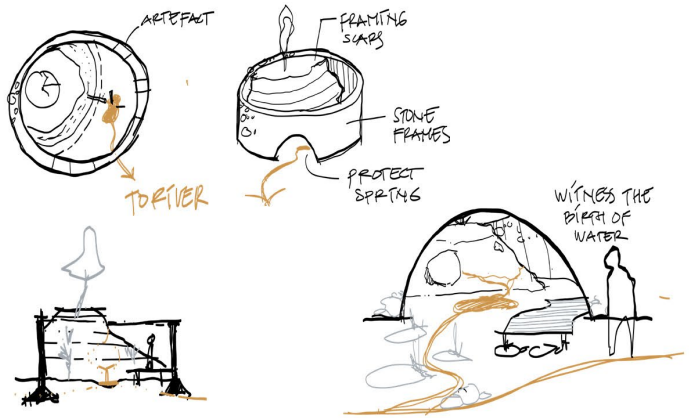


synergise — ***act of care***

design actions



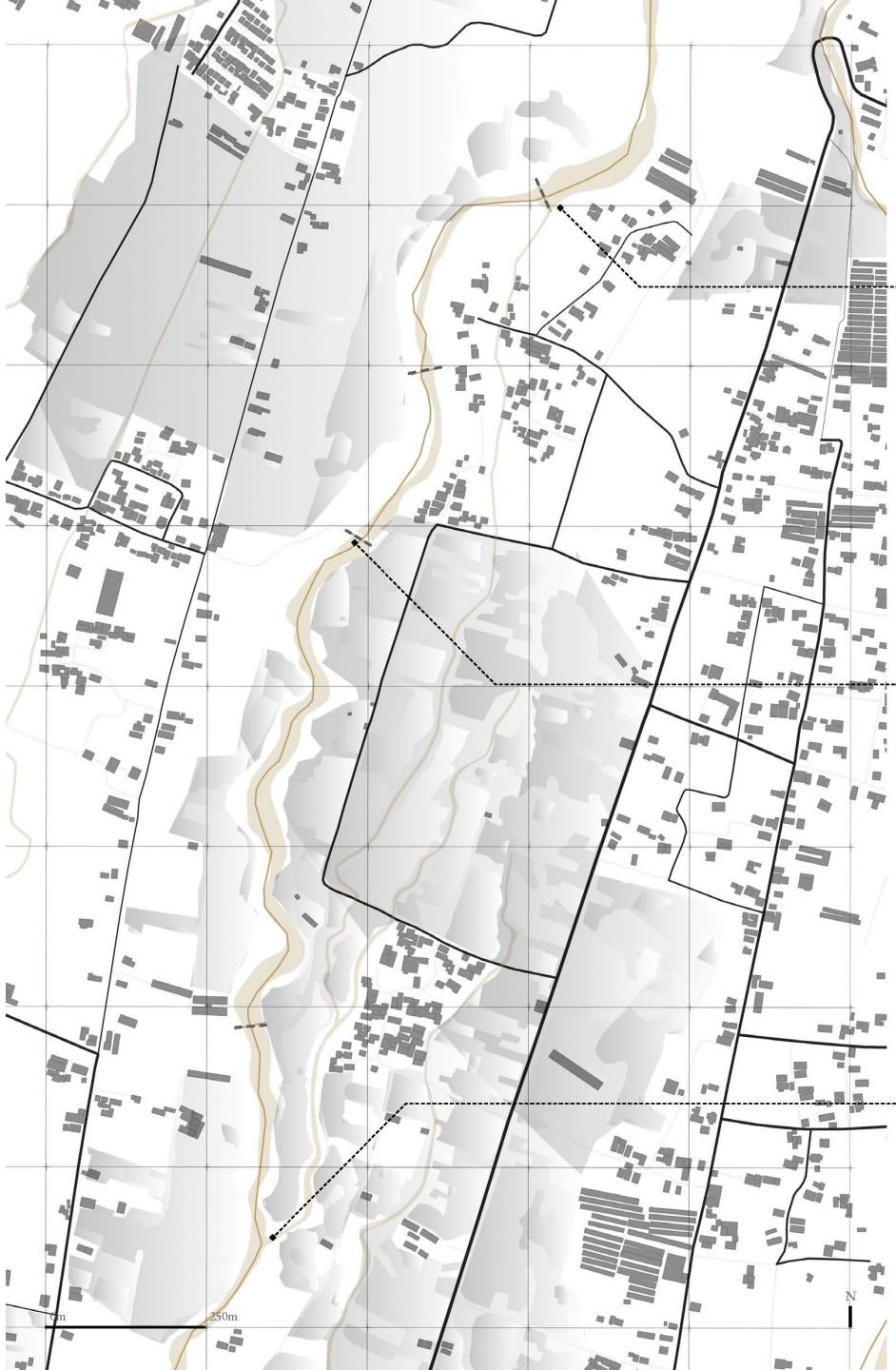
01. extend the borders and limit human invervention

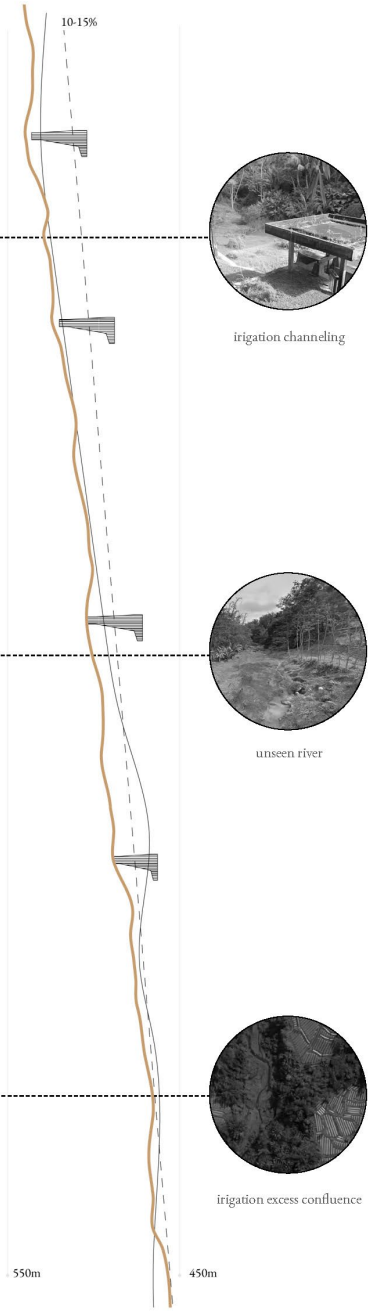


02. poetic infrastructure as destination and limit extensive mining

rights agencies
[1] right to flow
[2] right to have clean water
[3] right to functions
[4] right to biodiverse
[5] right to be sustain

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] work with natural forces
[4] generating sustainable economy



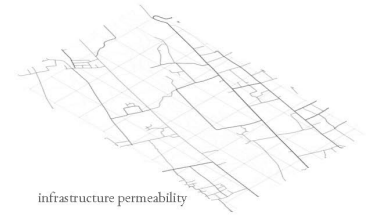


irrigation channeling

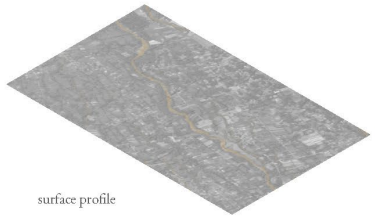
unseen river

irrigation excess confluence

built area and agriculture



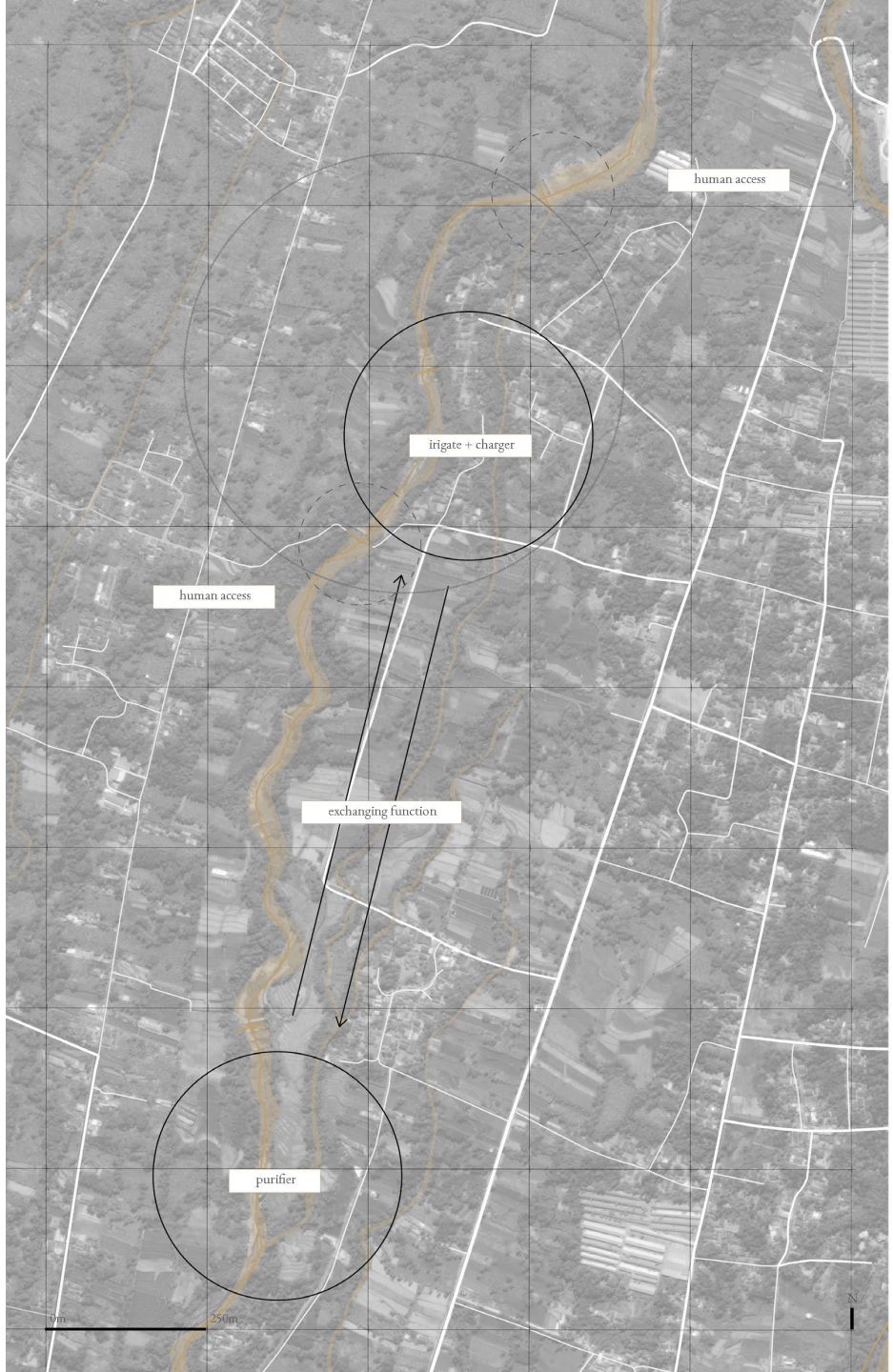
infrastructure permeability



surface profile

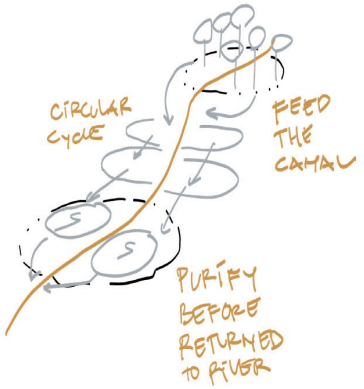
river
settlements
agricultural field
path/road
irrigation canal
dams

boundary condition

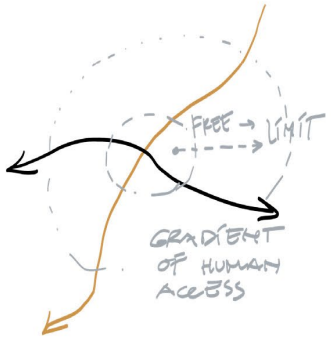


compromise — ***purify the river***

design actions



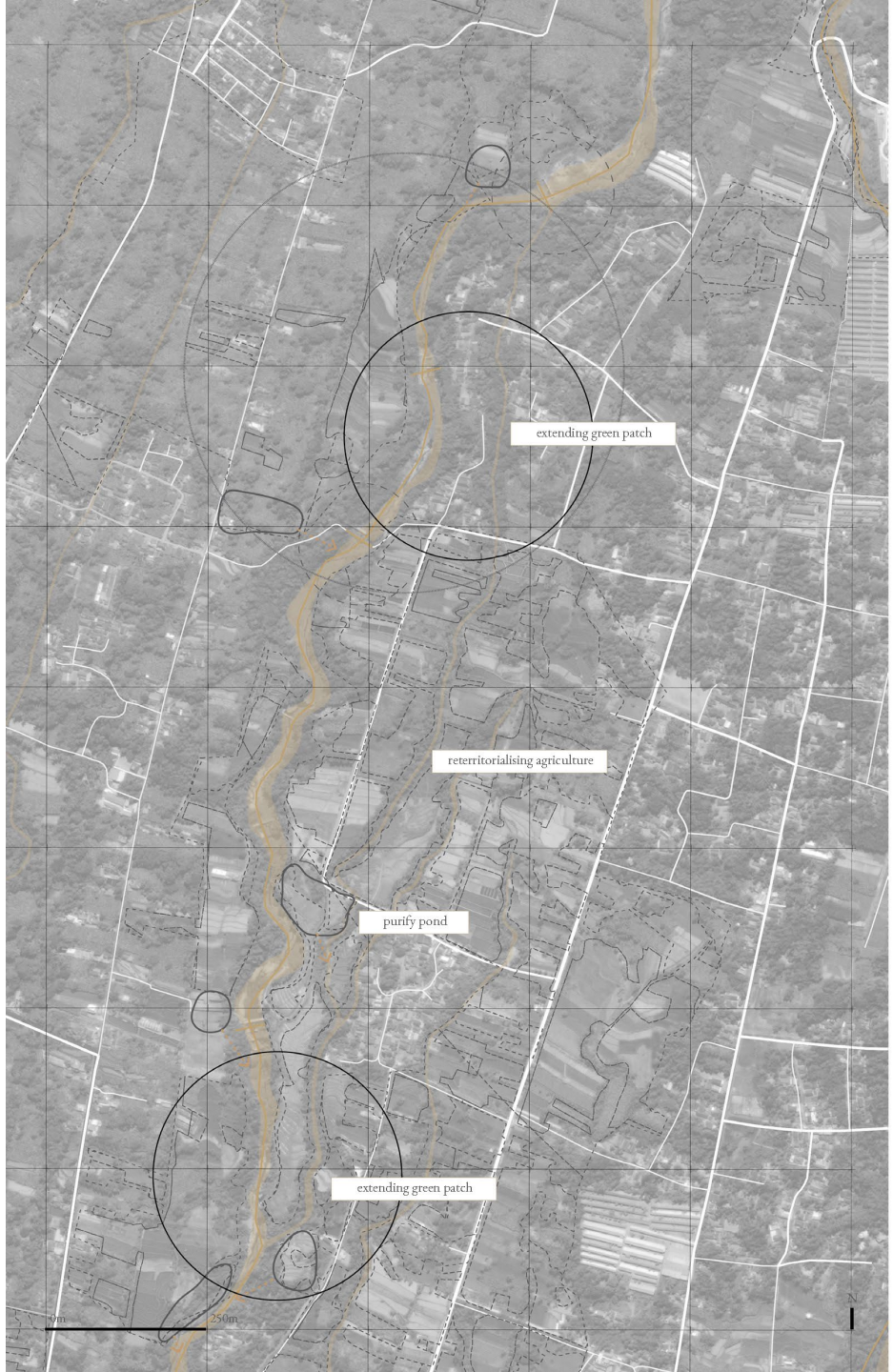
01. reterritorialising functions



02. designating the human limits

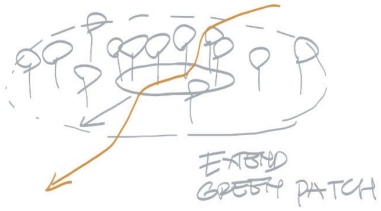
rights agencies
[1] right to flow
[2] right to biodiverse
[3] right to functions
[4] right to have clean water

systemic implication
[1] naturalised cycle
[2] naturalised borders
[3] increase green spaces
[4] purification

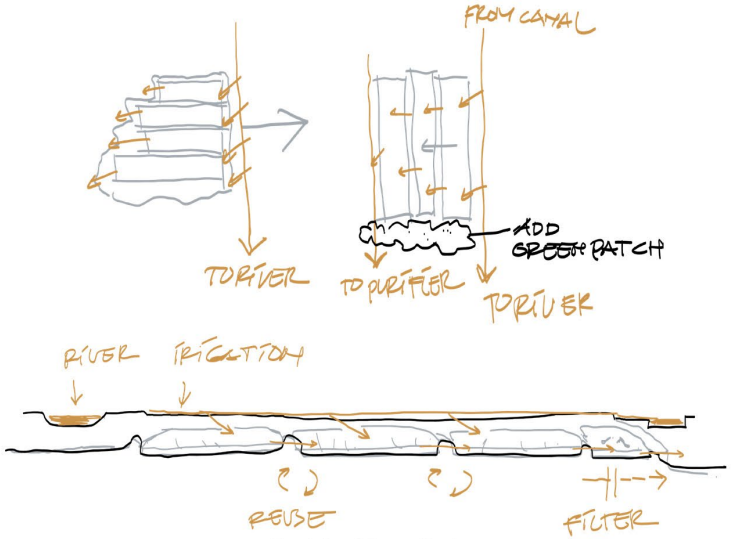


maximise — ***feeding the river***

design actions



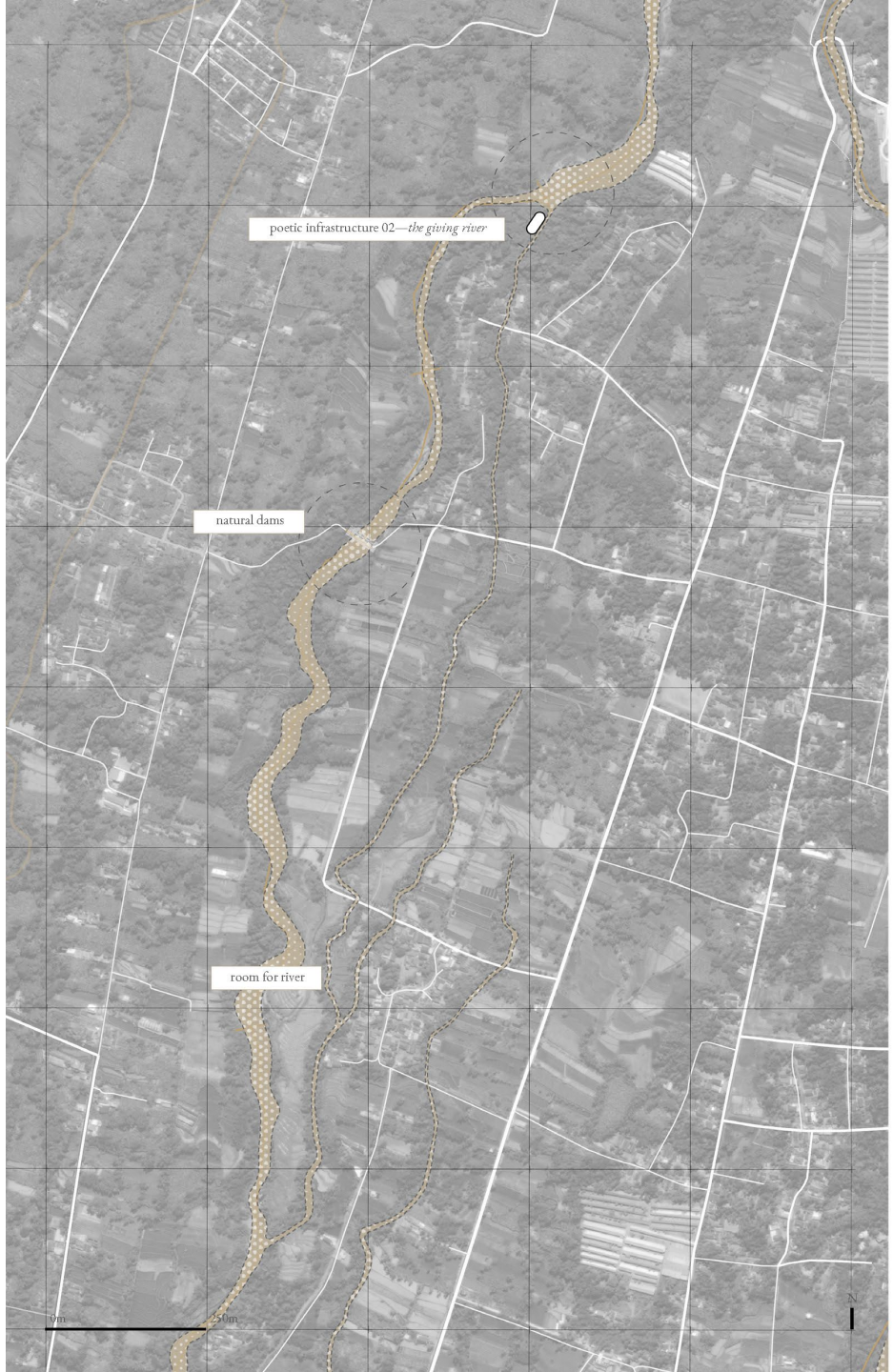
01. extend the green patch



02. argiculture fields as purify cycle

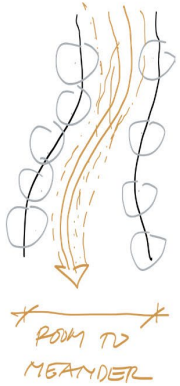
rights agencies
[1] right to flow
[2] right to have clean water
[3] right to functions

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] increase green spaces

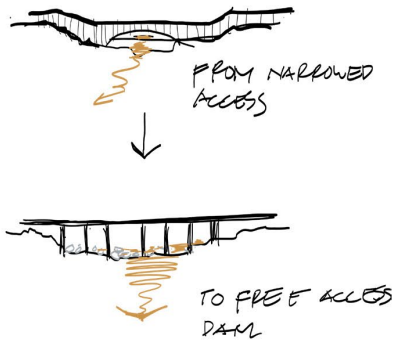


synergise — ***as river cares you***

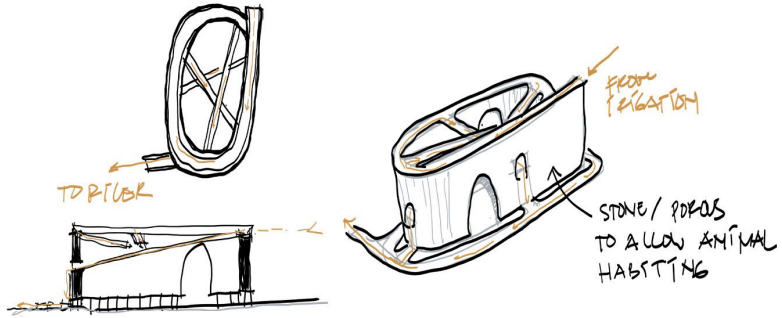
design actions



01. let river meander



02. naturalising the small dams + bridge



03. poetic infrastructure to see the water flows

rights agencies
[1] right to flow
[2] right to biodiverse
[3] right to functions

systemic implication
[1] naturalised sediment process
[2] naturalised borders
[3] increase green spaces