

Citizen Science for the Common Good:

A Social Innovation Lab for Practitioners

Lab Workbook

July 2019: Version 1

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Lab Workbook

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This Workbook emerged out of the development of a social innovation lab for citizen sciences in South Africa. It is a practical, hands-on workbook, intended to provide openings for thinking about how we engage in citizen science in practice, and accompanies the two-day Social Innovation Lab. This resource is intended to support citizen science projects and practitioners to deepen and strengthen the social aspects of their work. It is based on insights emerging from two Masters and two PhD studies in the field of citizen science, in South Africa. It is intended as a tool to open up dialogue and support critical reflection, rather than as definitive authority on the best way to engage in citizen science work. It was not designed as a stand-alone resource.

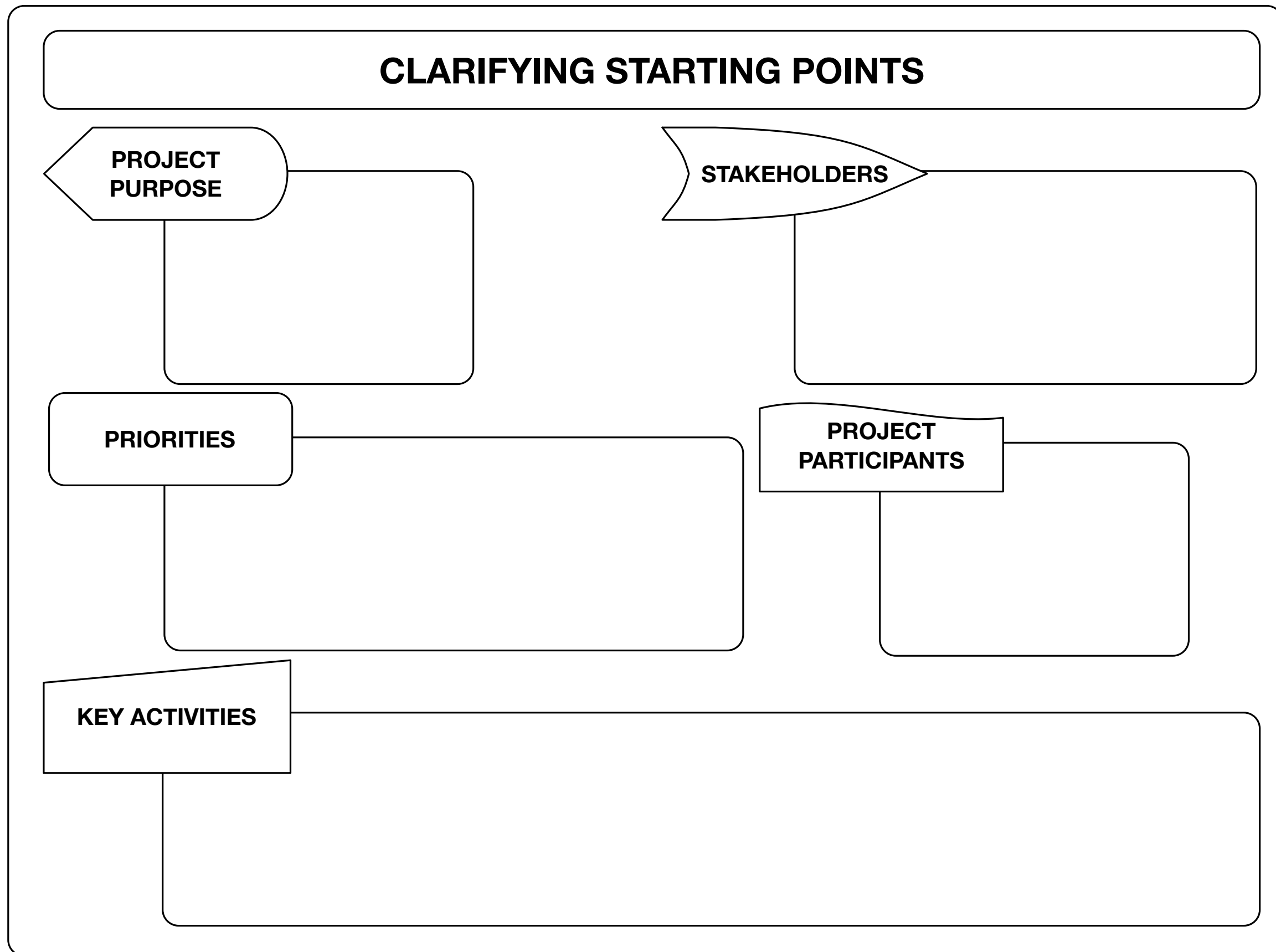
To cite this resource:

Vallabh, P., Alexander, J., Madiba, M., & van Wyk, S. (2019). *Citizen Science for the Common Good: A Social Innovation Lab for Practitioners. Lab Workbook*. Rhodes University: Grahamstown.

The Social Innovation Labs and Workbook were developed through the generous contributions of funding and in-kind support from the following organisations:

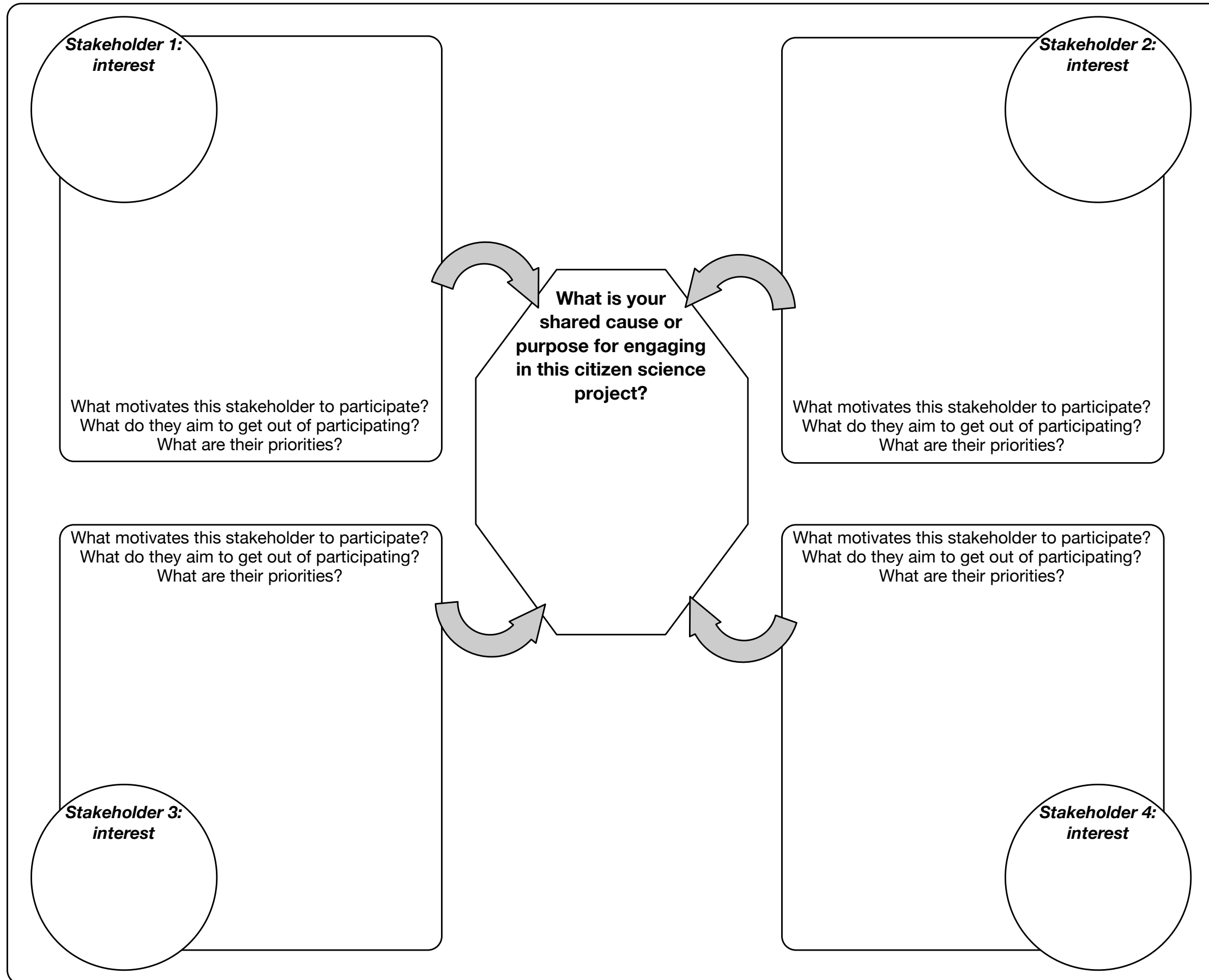


CLARIFYING STARTING POINTS



Starting points

CAUSES & PURPOSES



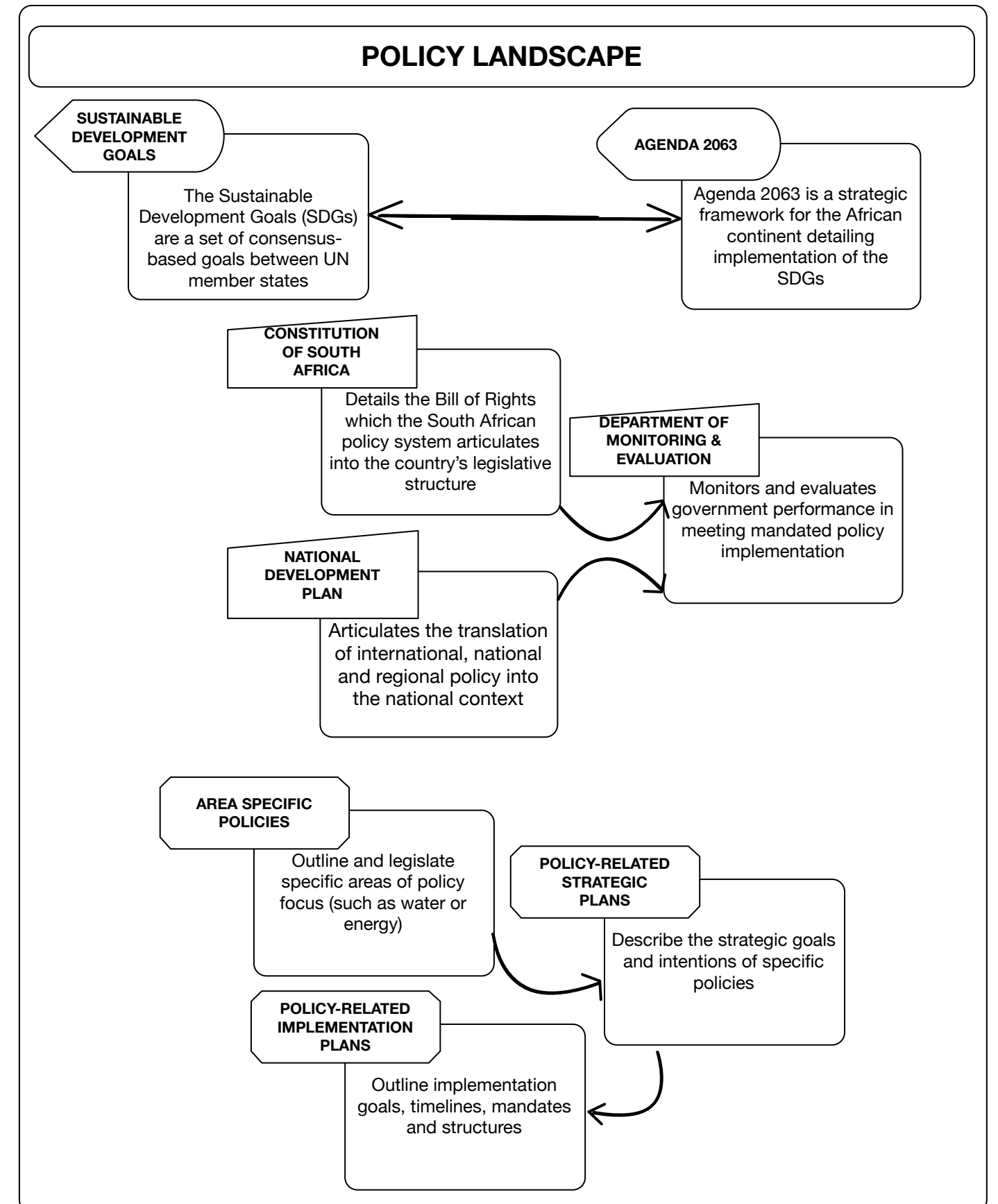
A range of reasons to participate

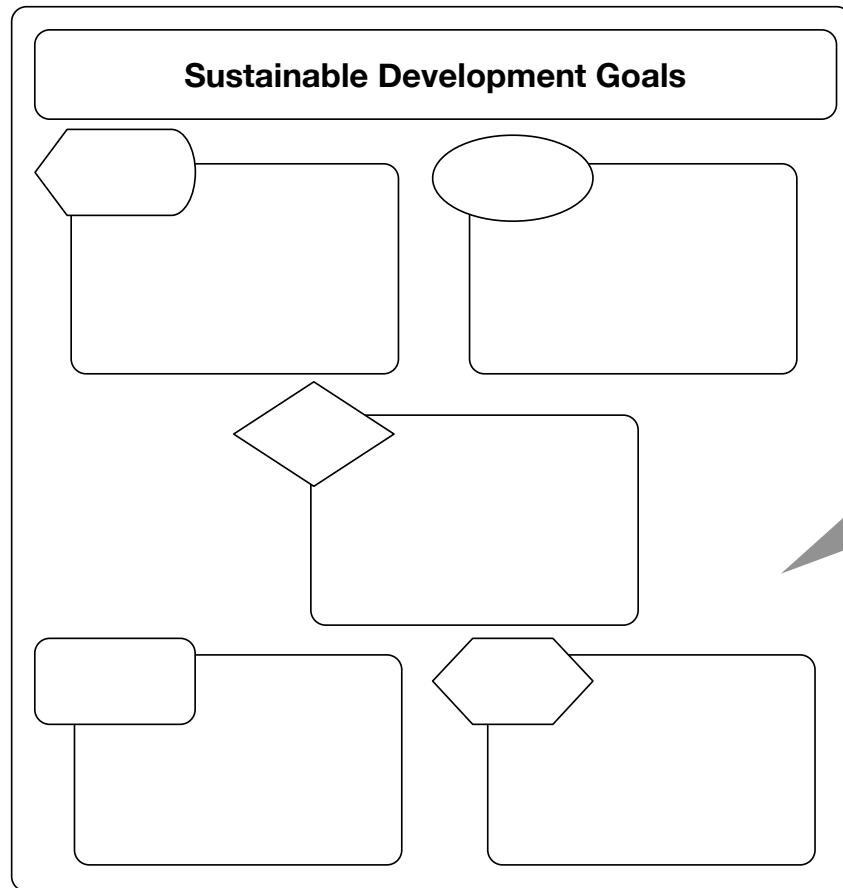
People participate in citizen science projects for different reasons. There will be an over-lapping 'shared interest', but it is useful to understand how and why stakeholders differ from each other. This helps to ensure that the shared purpose or interest is negotiated, and that project activities can be designed to meet the needs and interests of the different types of stakeholders involved in a project.

Stakeholders might include professional researchers, funders, government agencies, volunteers, NGOs, educators, etc.

NOTES

POLICY





Once you have identified the relevant SDGs, it is useful to identify the specific specific targets related to each goal which are directly relevant to your project. This creates a stronger policy pathway.

FIRST LEVEL: KNOWLEDGE OF BEING (knowledge of what is and what it not)

At this stage, it is useful to identify the types of policies, and engagement with policy that are, or are not, present in a citizen science project.

Here, we take a realistic view of what is in place and think through what is negative or absent that we would like to have in place. It is also useful to think about how and why particular types of policy work are present or absent within a project, and which types of policy work are being privileged.

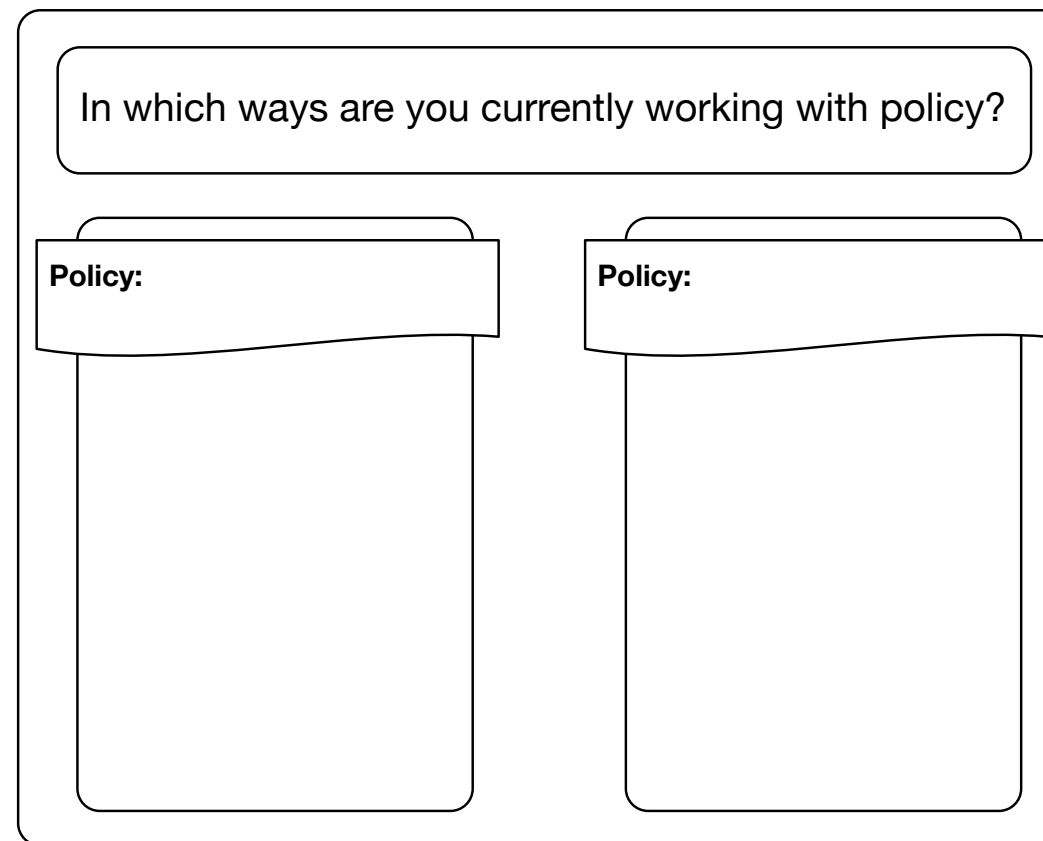
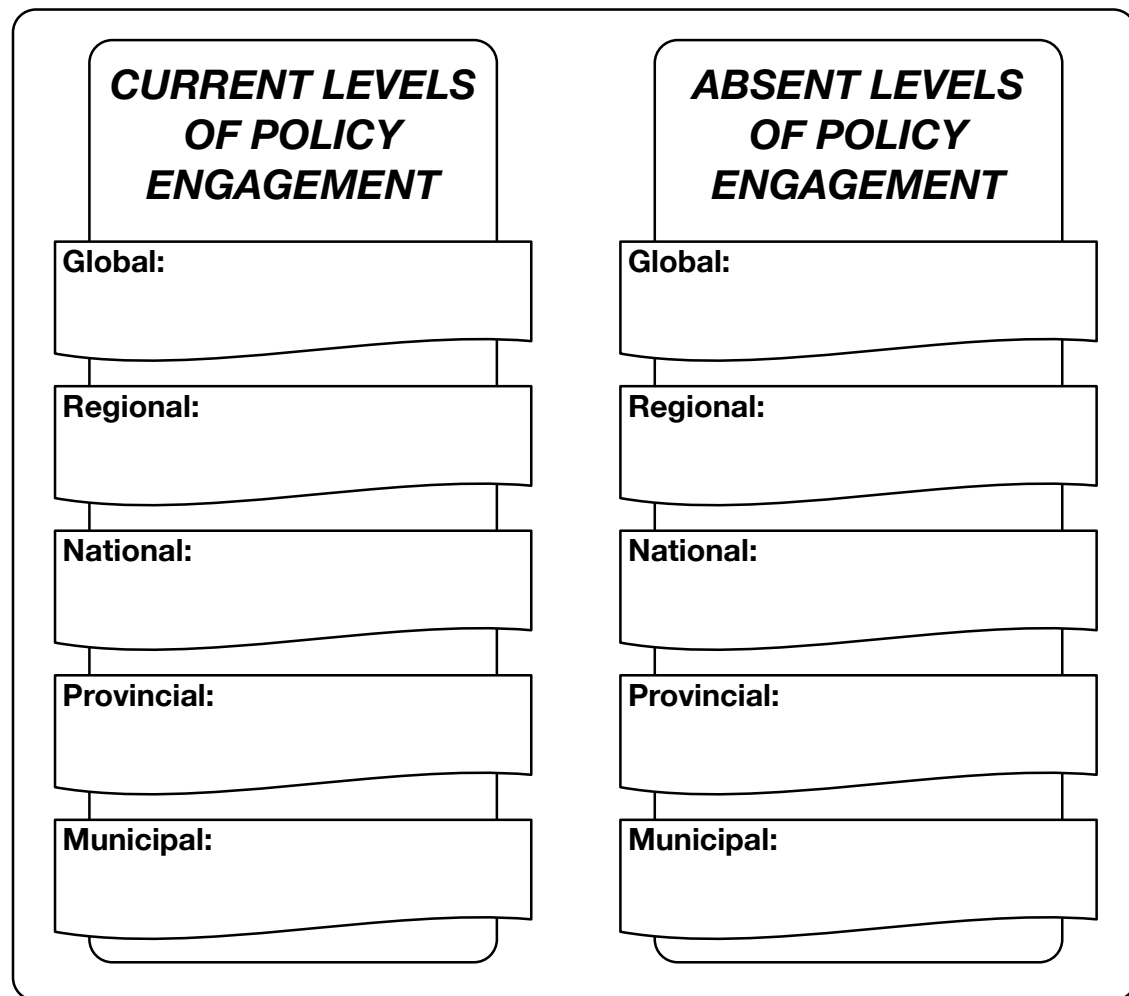
Consider:

Which policies is the project currently informed by, and at what level of policy is the project engaging?

How is the project informing policy at any level?

What are the gaps or absences related to policy work?

Is there indirect engagement with the policy landscape?



ARE YOU ENGAGED IN PROCESSES WHICH CONTRIBUTE TO DELIBERATIVE DEMOCRACY?

ARE YOU ENGAGED IN PROCESSES WHICH CONTRIBUTE TO PARTICIPATORY DEMOCRACY?

ARE YOU ENGAGED IN PROCESSES WHICH CONTRIBUTE TO RADICAL DEMOCRACY?

SECOND LEVEL: KNOWLEDGE OF WHAT COULD BE AND WHAT COULD BE DONE DIFFERENTLY

This level is about considering possibilities. It provides a space to open up the imagination and, envision possibilities and expand aspirations. This level allows us to consider what is possible in an ideal context or world.

Here, we aim to actively 'absent' those structures, systems or contextual challenges that limit or constrain what we do and how we do it. We propose alternatives, expansions and potentials, rooted in the first level (what is, and what is not).

Consider:

How could you expand your engagement with diverse levels of policy work (and governance)?

How could you integrate processes which contribute to deliberative, participatory or radical democracy?

How could you utilise existing policy structures to support the citizen science project work you are engaged in?

Which currently absent policies, policy systems or governance mechanisms could you collaboratively establish or articulate to support project purposes?

How could the knowledge being produced within your citizen science project inform local, national or international governance and/or policy development?

Are there aspects of your project work which could be connected into the national system of governance?

Three large, empty rectangular boxes with rounded corners, arranged horizontally. Each box has a small tab-like shape at the top, suggesting they are part of a larger sheet or folder. These boxes are intended for taking notes during the 'Consider' phase.A large, empty rectangular box with rounded corners. A circular callout is attached to the top right corner of the box. The text inside the circle reads: "HOW COULD YOU ENGAGE IN PROCESSES WHICH CONTRIBUTE TO DELIBERATIVE DEMOCRACY?".A large, empty rectangular box with rounded corners. A circular callout is attached to the top right corner of the box. The text inside the circle reads: "ARE YOU ENGAGED IN PROCESSES WHICH CONTRIBUTE TO PARTICIPATORY DEMOCRACY?".A large, empty rectangular box with rounded corners. A circular callout is attached to the top right corner of the box. The text inside the circle reads: "ARE YOU ENGAGED IN PROCESSES WHICH CONTRIBUTE TO RADICAL DEMOCRACY?".

**STRENGTHENING
SYSTEMS OF
DEMOCRACY**

**THIRD LEVEL: KNOWLEDGE OF THE IMPLICATIONS OF OUR CHOICES FOR
OURSELVES, OTHERS AND THE MORE-THAN-HUMAN WORLD**

In this level, we centre ethics and values - all of the present and absent relationships with the policy landscape noted in level 1, and all the possibilities that were identified in level 2 are considered in terms of their ethical implications.

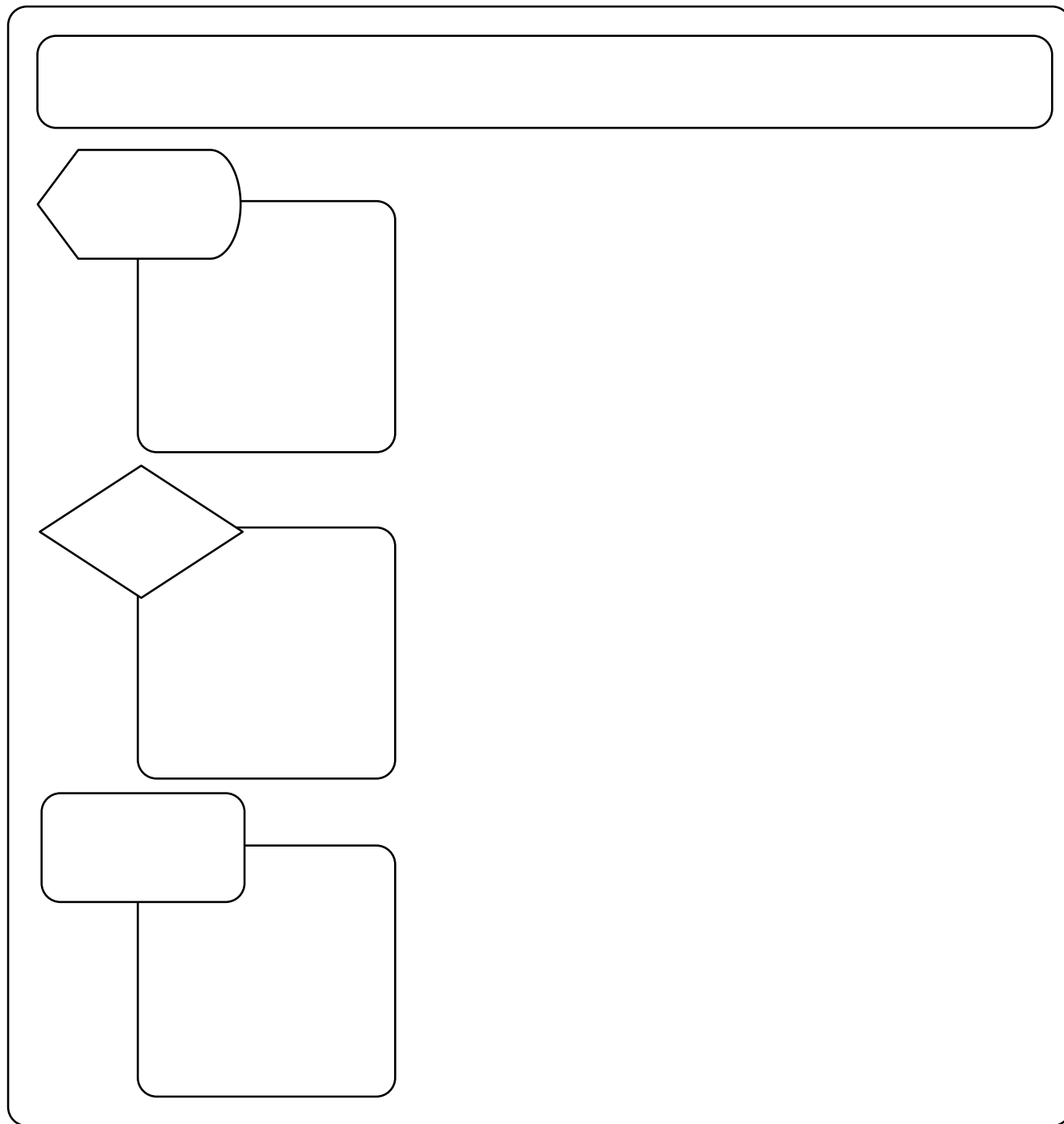
Implications for the individuals, the project, others, the earth and the web of life are all considered. We think about notions such as Ubuntu and Fairness. Here, the idea of what contributes to *the common good* is at the heart of ethical considerations. We also consider which forms of actions and activities related to the policy landscape *would count as commoning*.

Consider:

How could you mobilise and strengthen systems of deliberative, participatory or radical democracy in your project? South Africa's legal system is based on a dual system of representative and participatory democracy - this means that citizens have both the right and the responsibility to contribute to governance within the country.

How could you challenge policy mechanisms that undermine those common good interests within your project? Or how could you contribute to strengthening those policy mechanisms which support, enable and facilitate the common good interests within your project?

How could you work with different policy systems in ways that challenge unfair power structures, within the context of your project interests?



FOURTH LEVEL: KNOWLEDGE OF WHAT CHANGE CAN REALISTICALLY BE ACHIEVED IN THIS PROJECT CONTEXT

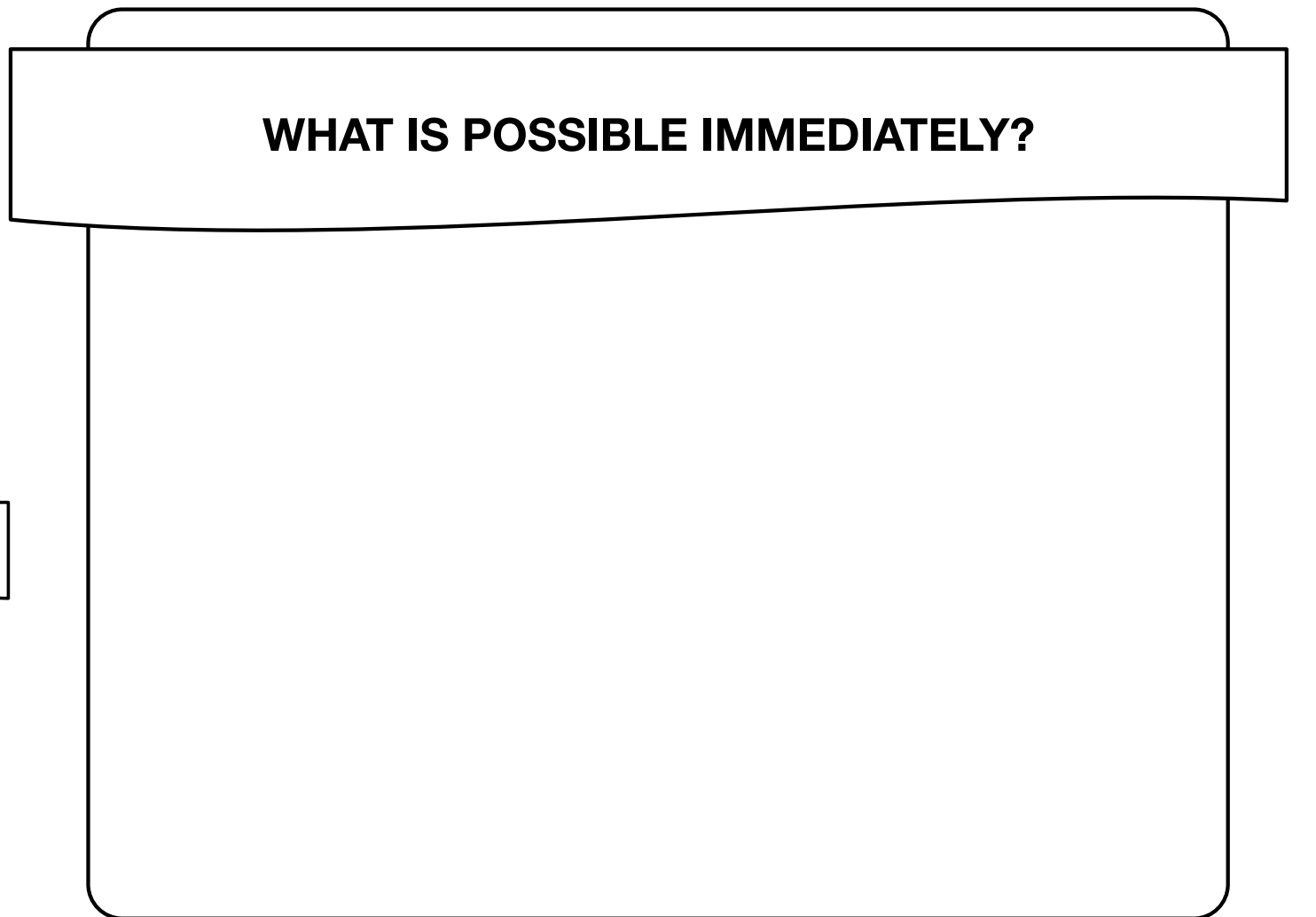
At this level, we consider what is practical right now, in the current context of the citizen science project. We also consider what is practical and possible in the near or medium-term future.

Here, we identify concrete actions that are informed by the three earlier levels. It is about identifying real (ethical) possibilities and taking action based on those possibilities.

This level allows us to test out ideas and aspirations identified in earlier levels.

This level is based on the idea that reasonable knowledge and insight into what is ethical leads to a stronger supported capacity for practical human agency; through this more empowered perspective, there is a stronger basis for change in the 'world' of the citizen science project.

At this level, it is important to consider the realities of your project's specific contexts and resources, both currently, and in the medium-term future.



NOTES

KNOWLEDGES

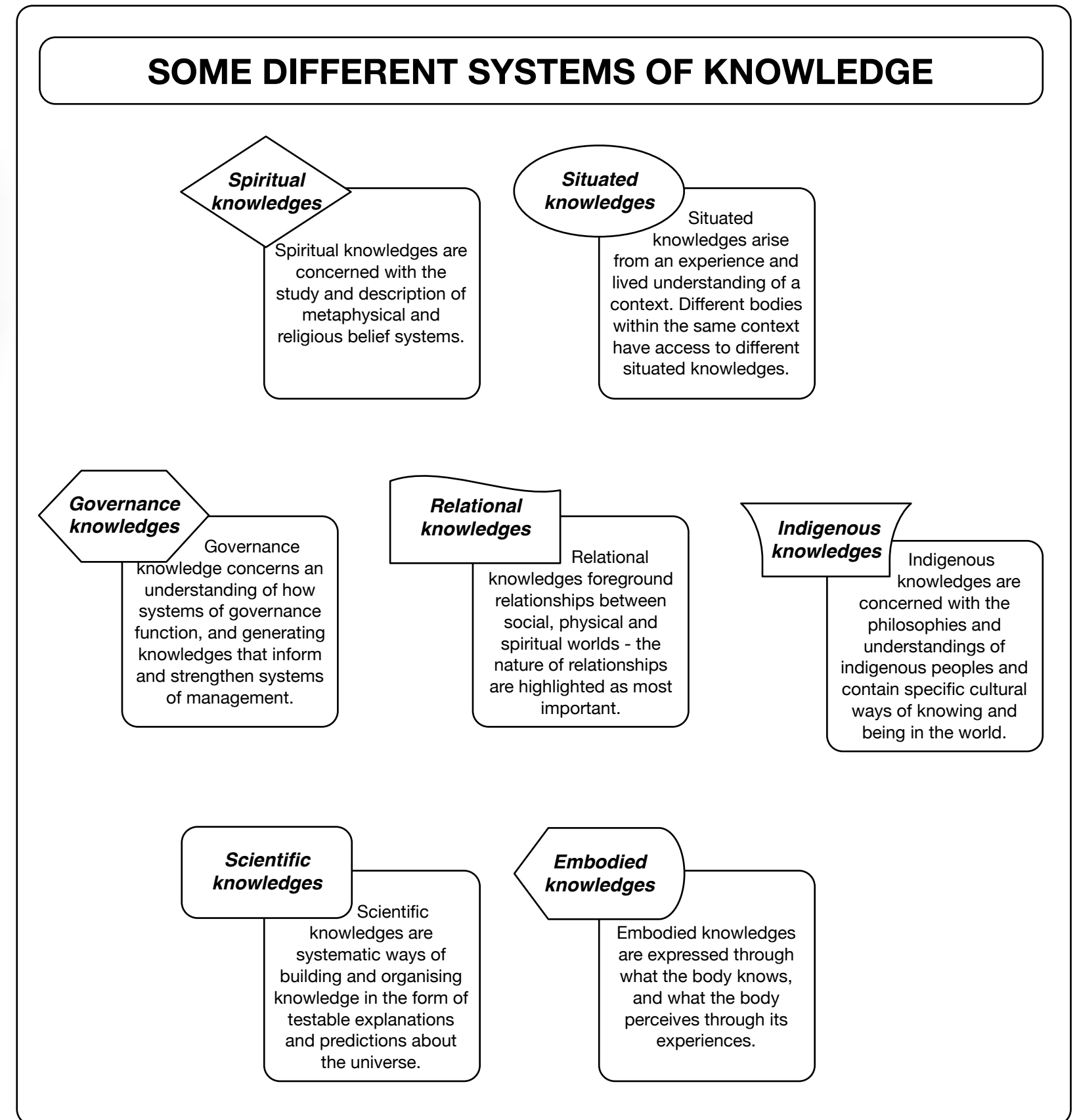
**“ All knowledges have internal and external limits ...
Different knowledges render different things visible and
invisible”**

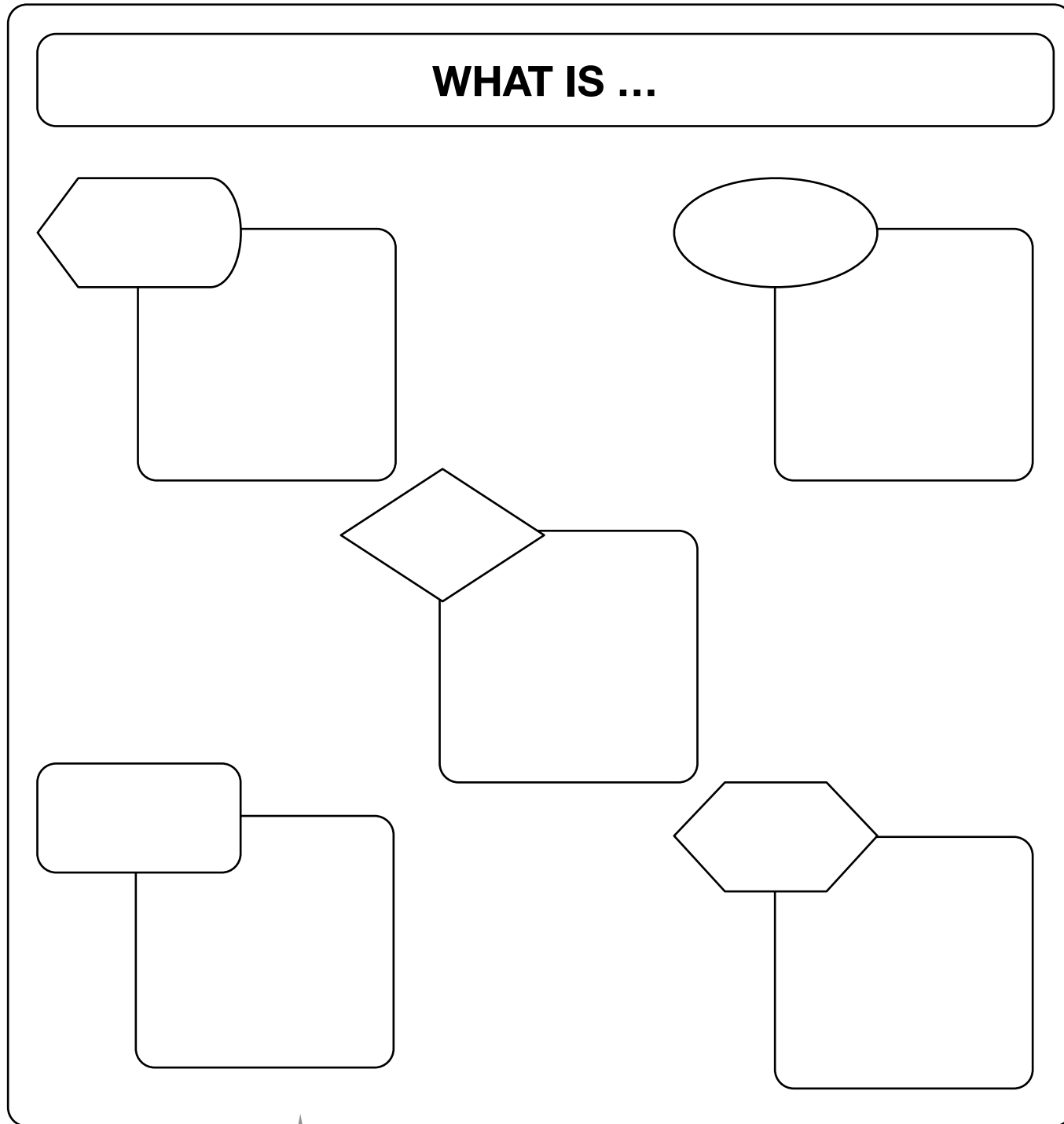
(de Sousa Santos, 2007:10-12)

Citizen science projects seem to mobilise a range of different knowledge types in a variety of sequences, and with different goals in mind. However, knowledges other than scientific knowledges are seldom recognised within projects, and their contributions are rarely reported.

Cognitive justice is concerned with which types and forms of knowledge are being privileged. Distributive justice is concerned with who benefits from different activities, and whether the benefits are fair.

Recognising the value that different forms of knowledge can bring to a project, and mapping out the existing ecology of knowledges already operating in a project can be a powerful process. When the contributions and value of different forms of knowledge are recognised, it enables project designers to strengthen and support the practices related to a knowledge form. Recognising and reporting on diverse knowledge contributions provide a basis for strengthening cognitive and distributive forms of justice.





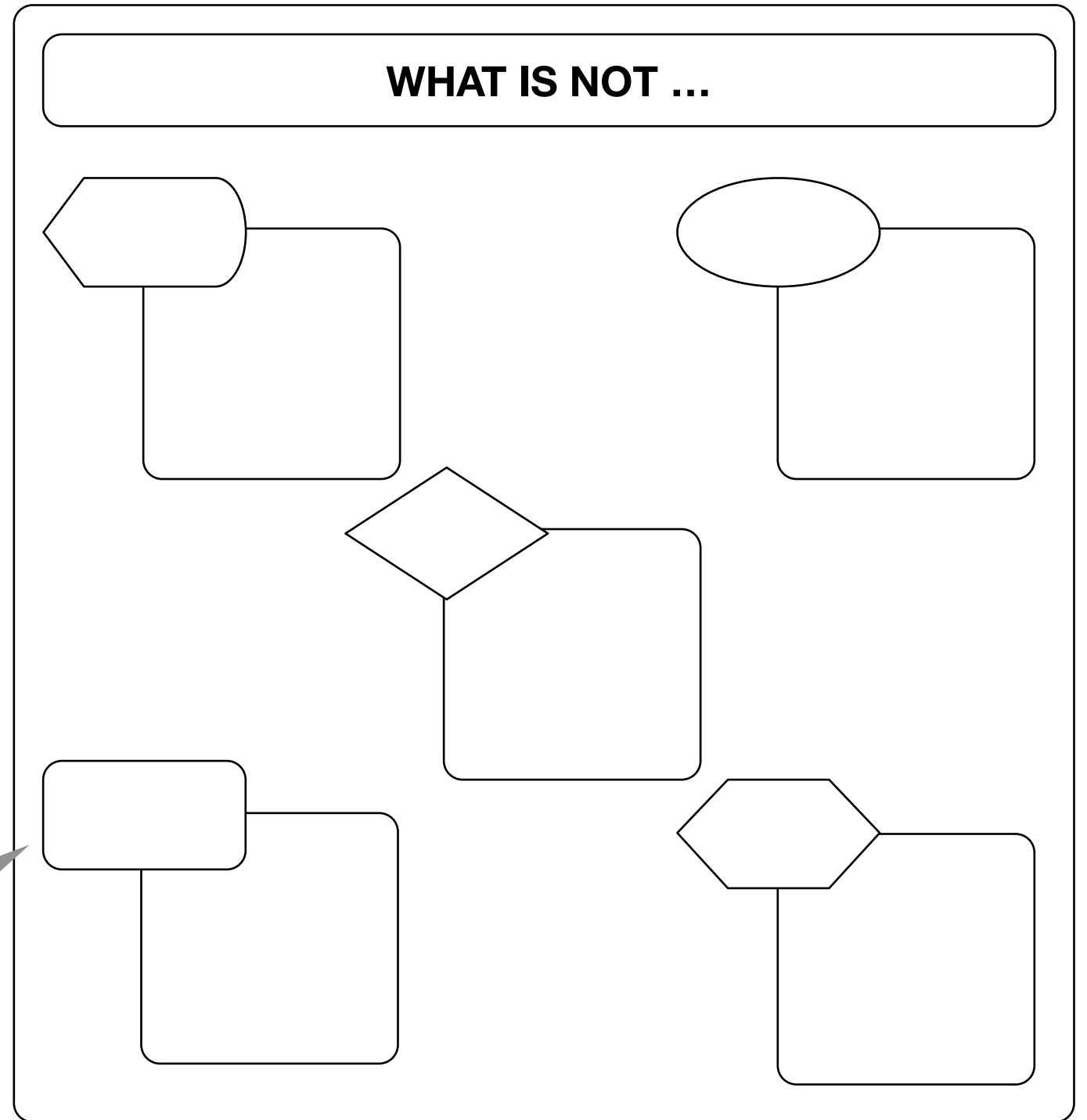
What are the different types of knowledges you currently have in your project? How are they included and what roles do they play? Think about both those knowledges that are officially part of the project, as well as those that are present but unnamed or not officially recognised.

Which types of knowledge are intentionally or unintentionally excluded from the project currently? What are the possible reasons for their exclusion?

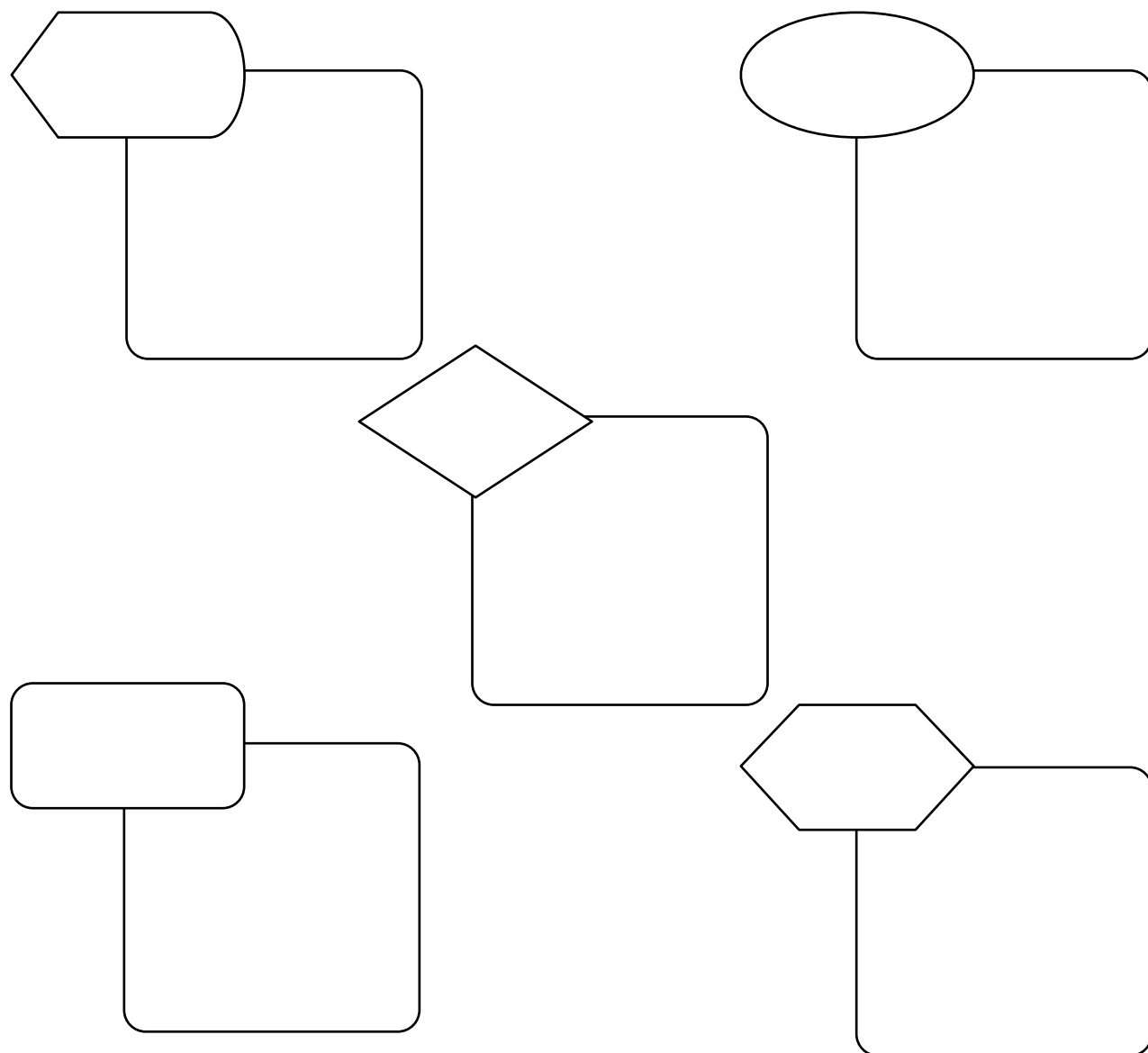
**FIRST LEVEL: KNOWLEDGE OF BEING
(knowledge of what is and what it not)**

At this stage, it is useful to identify the types of knowledges that are, or are not, present in a citizen science project.

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RECOGNISING/SUPPORTING KNOWLEDGES



SECOND LEVEL: KNOWLEDGE OF WHAT COULD BE AND WHAT COULD BE DONE DIFFERENTLY

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Here, we aim to actively 'absent' those structures, systems or contextual challenges that limit or constrain what we do and how we do it. We propose alternatives, expansions and potentials, rooted in the first level (what is, and what is not).

Consider:

Could you officially or formally recognise and support unofficial/unrecognised knowledges in your project?

Could other forms of knowledge contribute to and enhance the knowledge being produced in your project? How could these other knowledges be included? How could they be recognised and valued?

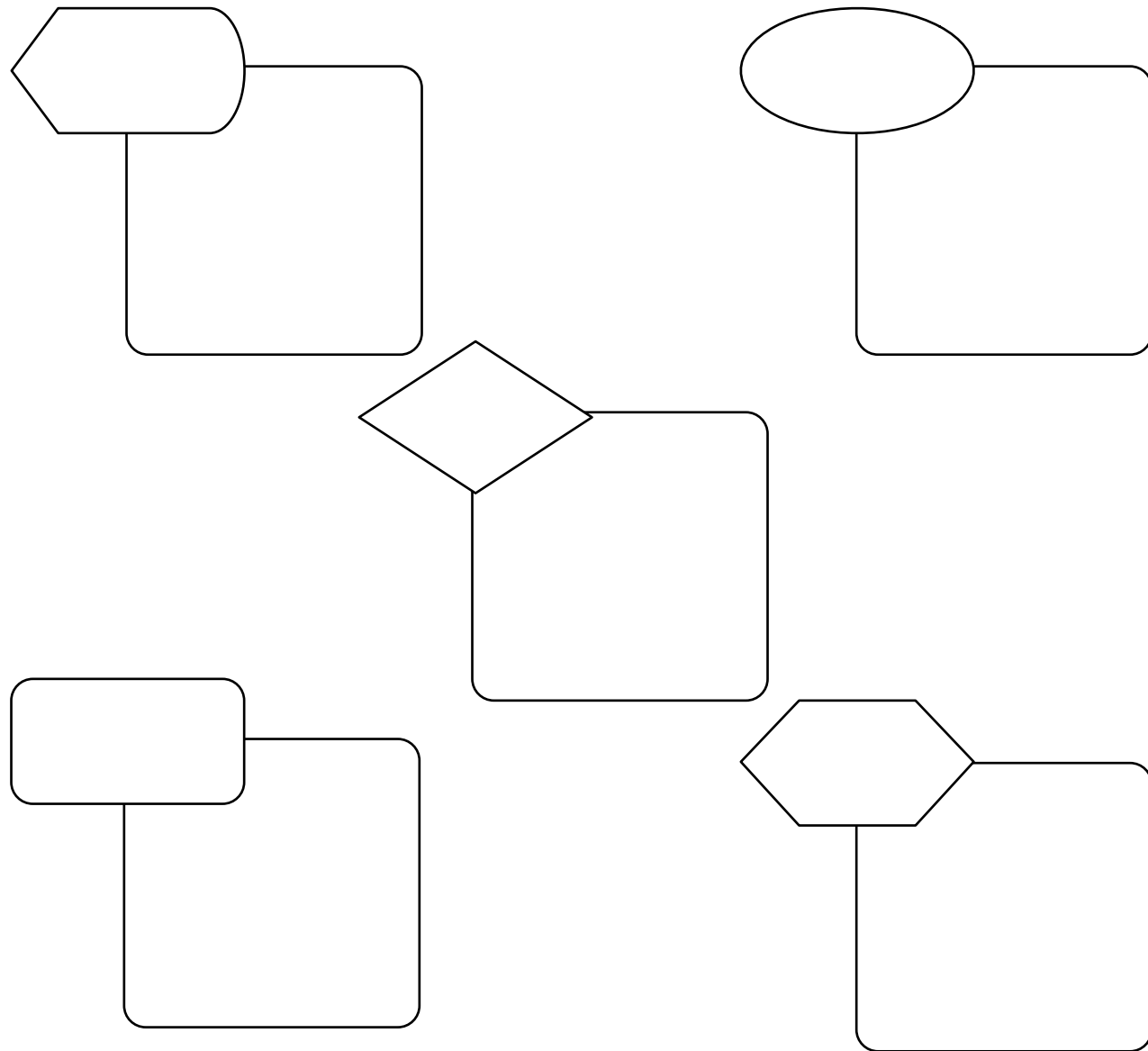
What needs to be put in place to support and strengthen an ecology of knowledges in your project?

HOW COULD DIFFERENT FORMS OF KNOWLEDGE BE RECOGNISED?

HOW COULD MORE PEOPLE GAIN ACCESS TO KNOWLEDGE BEING PRODUCED IN THE PROJECT?

WHAT ARE THE POSSIBILITIES FOR ECOLOGIES OF KNOWLEDGES IN YOUR PROJECT?

ETHICAL IMPLICATIONS OF INCLUDING/ EXCLUDING PARTICULAR KNOWLEDGES



THIRD LEVEL: KNOWLEDGE OF THE IMPLICATIONS OF OUR CHOICES FOR OURSELVES, OTHERS AND THE MORE-THAN-HUMAN WORLD

In this level, we centre ethics and values - all of the present and absent knowledges noted in level 1, and all the possibilities that were identified in level 2 are considered in terms of their ethical implications.

Implications for the individuals, the project, others, the earth and the web of life are all considered. We think about notions such as Ubuntu and Fairness. Here, the idea of what contributes to *the common good* is at the heart of ethical considerations. We also consider which forms of actions and activities related to knowledge *would count as commoning*.

Consider:

How could you strengthen cognitive justice and distributive justice in your project?

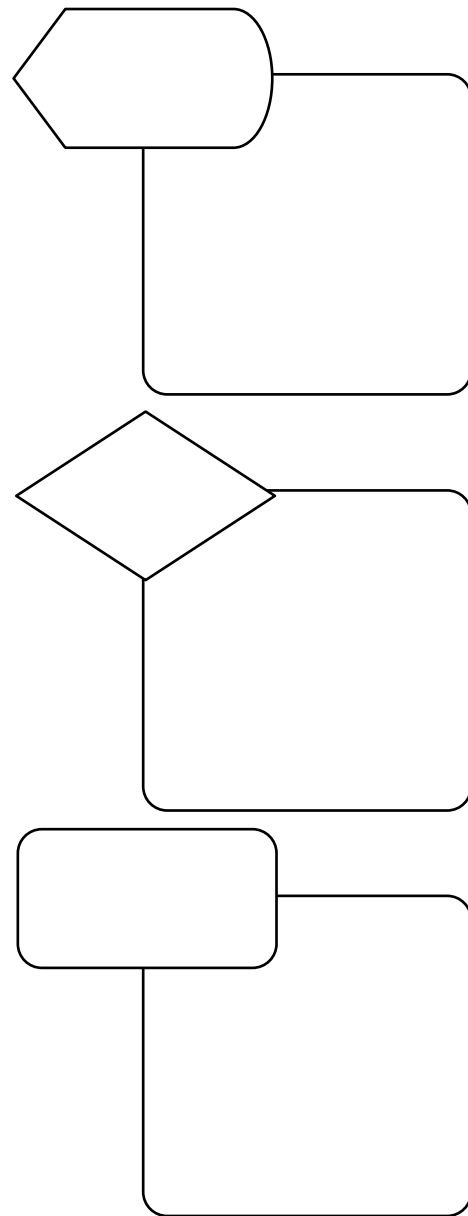
How could you build knowledge in ways that contribute to the common good (for example, through publishing knowledge emerging from the project in open journals or in multiple formats that a wider range of people could access)?

How could you work with different knowledges in ways that challenge unfair power structures?

**STRENGTHENING
COGNITIVE JUSTICE**

**STRENGTHENING
DISTRIBUTIVE JUSTICE**

ECOLOGIES OF KNOWLEDGES



FOURTH LEVEL: KNOWLEDGE OF WHAT CHANGE CAN REALISTICALLY BE ACHIEVED IN THIS PROJECT CONTEXT

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**STRENGTHENING
COGNITIVE JUSTICE**

**STRENGTHENING
DISTRIBUTIVE JUSTICE**

NOTES

PARTICIPANTS & PARTICIPATION

There are a range of citizen sciences, each with different models of participation, and diverse demographics of participants. There is often an implicit assumption that science and science skills learnt during participation in citizen science projects is transferable, and that volunteers are able to take what they learn and apply that knowledge into other areas of life. The science-learning is framed as an asset which compensates volunteers for their participation in a project.

However, there is sparse research to support such assumptions - especially within industrially-developing contexts. Many models of citizen science are based on older European and American models, which might not be well-suited to the contexts of volunteers in South Africa.

Issues of participation can sometimes become over-simplified in terms of recruiting data-gathers, and maintaining volunteer numbers.

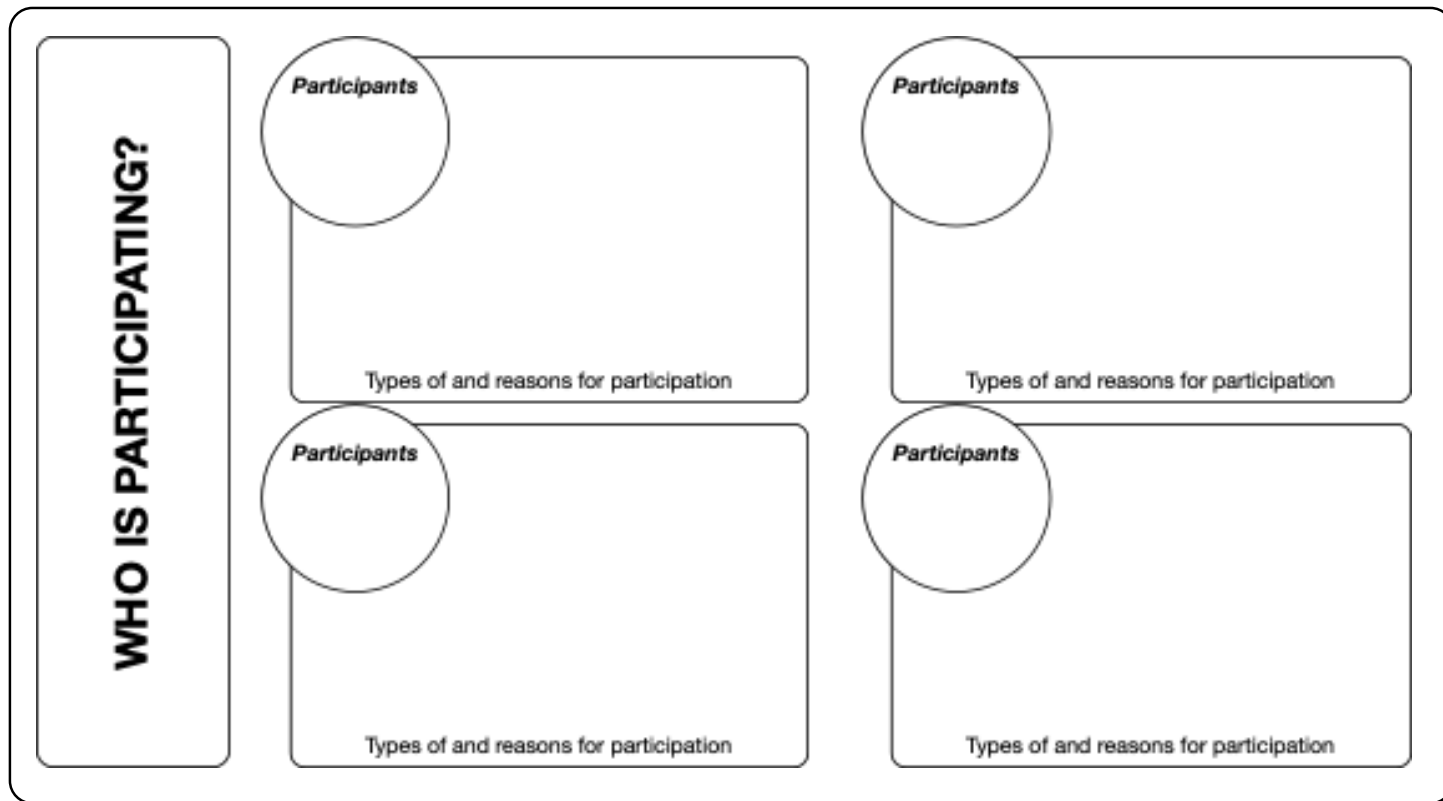
However, when considering the common good, the interest in participation, and relationships with and between participants becomes far more complex.

Considerations about diverse motivations, cognitive and distributive justice, forms and levels of participation, and power relationships and dynamics between different types of participants (and especially between professional and volunteer participants), come to the fore.

In those citizen science projects which aim to extend systems of deliberative or participatory democracy, questions around authenticity, begin to emerge.

In projects whose primary goal is scientific knowledge production, cognitive (whose knowledge counts) and distributive (who is reaping the benefits from the knowledge being produced) justice come to the fore.

Typologies of participation (Reed, 2008)	
Basis of typology	Example
Typology based on different degrees of participation on a continuum. Numerous alternative terms suggested for different rungs of the ladder (e.g. Biggs, 1989; Pretty, 1995a,b; Farrington, 1998; Goetz and Gaventa, 2001; Lawrence, 2006)	Arnstein's (1969) ladder of participation. Sometimes presented as a wheel of participation Davidson (1998)
Typology based on nature of participation according to the direction of communication flows	Rowe and Frewer (2000)
Typology based on theoretical basis, essentially distinguishing between normative and/or pragmatic participation	Thomas (1993), Beierle (2002)
Typology based on the objectives for which participation is used	Okali et al. (1994), Michener (1998), Warner (1997), Lynam et al. (2007), Tippett et al. (2007)



**FIRST LEVEL: KNOWLEDGE OF BEING
(knowledge of what is and what it not)**

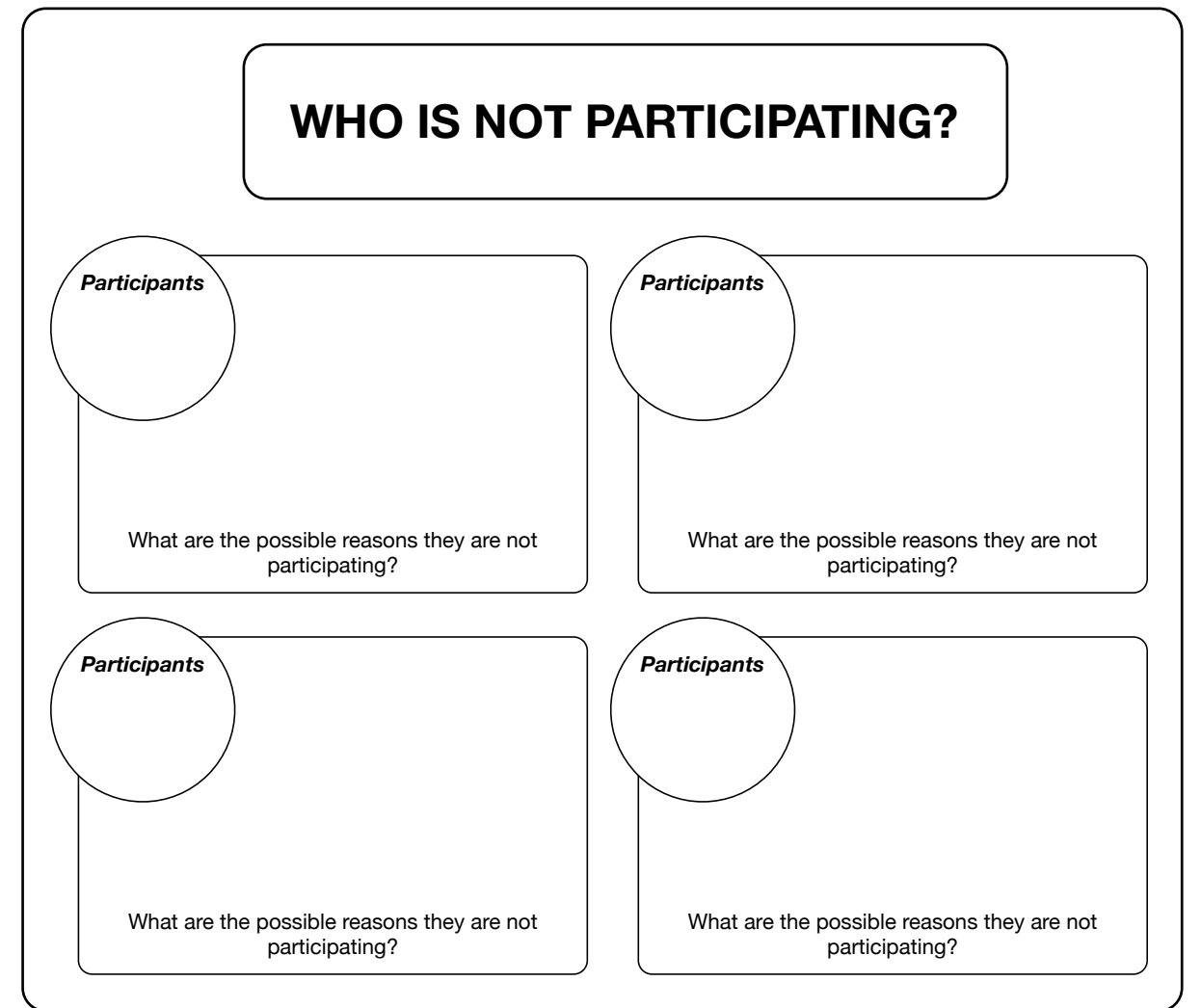
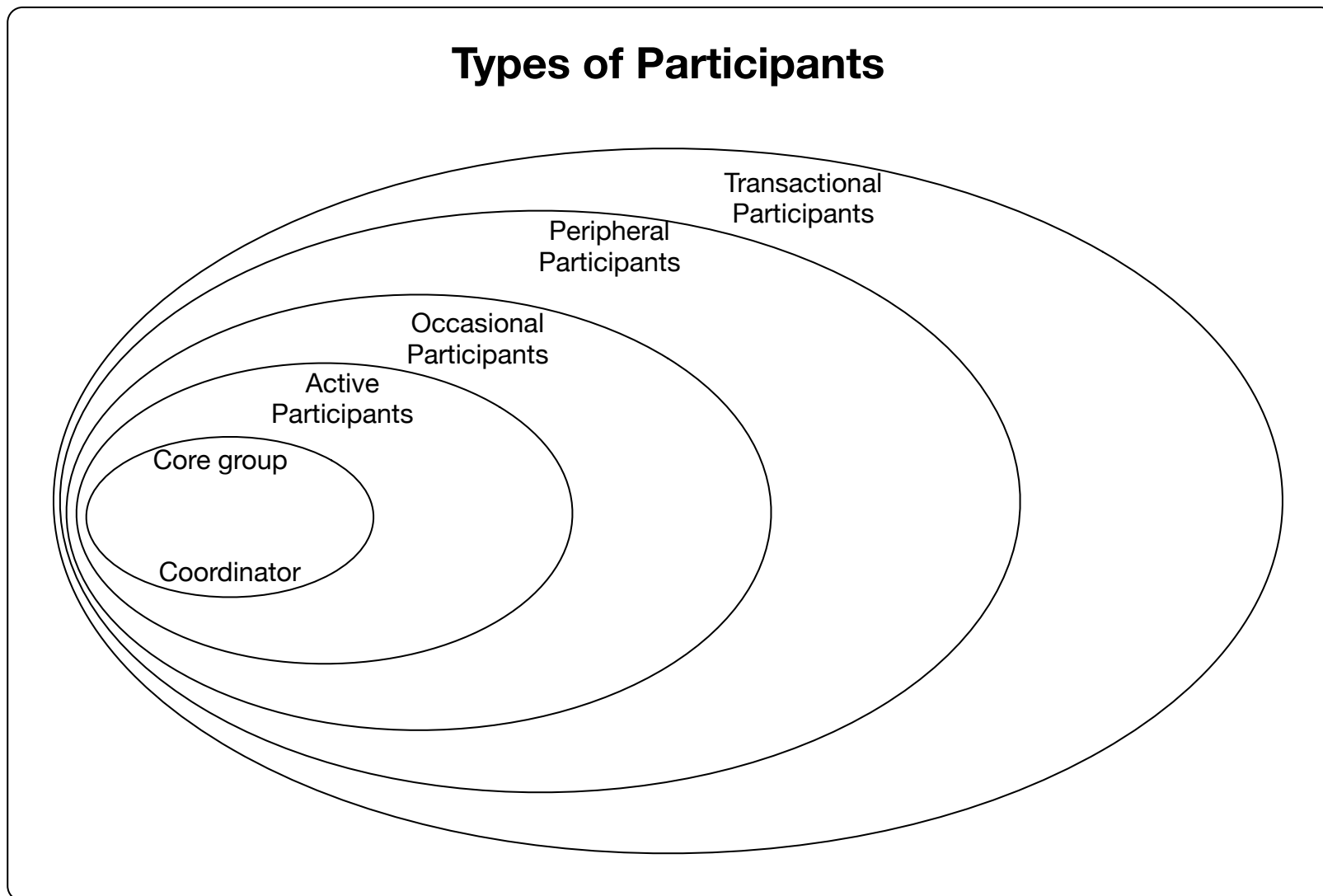
At this stage, it is useful to identify the types of participants and levels of participation within a citizen science project.

Here, we take a realistic view of what is in place and think through what is negative or absent that we would like to have in place. It is also useful to think about how and why particular types of participants and forms of participation are present or absent within a project, and which participants are in positions of power or are being privileged.

Who is currently participating in your project? How and why are they participating?

Who is not participating? Why do you think this is so?

Which types of participation are being actively supported, and why?



WHO COULD PARTICIPATE DIFFERENTLY?

Participants

How could their participation be supported?

Participants

How could their participation be supported?

Participants

How could their participation be supported?

Participants

How could their participation be supported?

SECOND LEVEL: KNOWLEDGE OF WHAT COULD BE AND WHAT COULD BE DONE DIFFERENTLY

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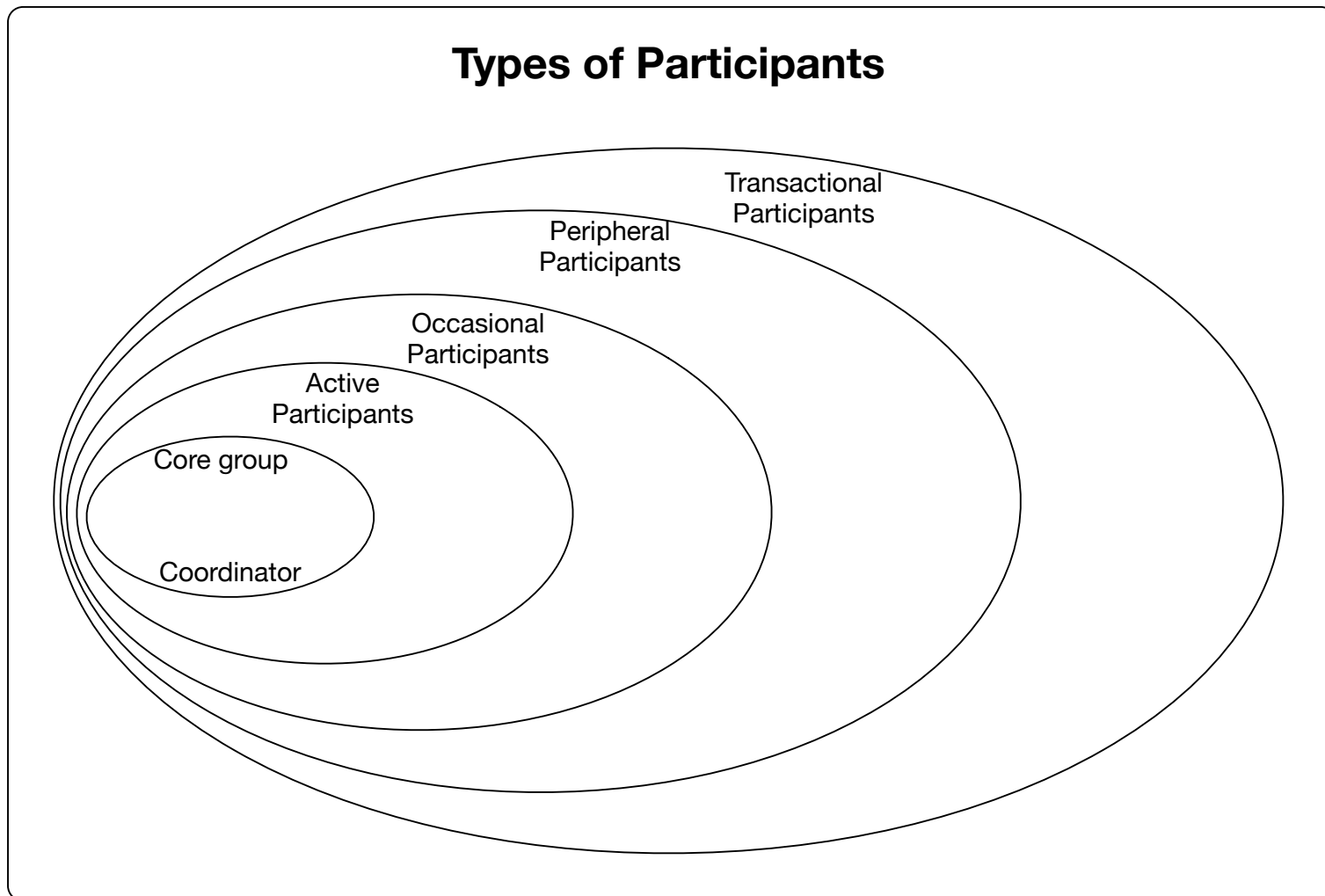
Here, we aim to actively 'absent' those structures, systems or contextual challenges that limit or constrain what we do and how we do it. We propose alternatives, expansions and potentials, rooted in the first level (what is, and what is not).

Consider:

Who could be included in the project as new participants?

How could your current participants participate differently, or more deeply?

Ideally, what types of participation would you need to strengthen your project, and deepen your impact?



WHO COULD PARTICIPATE?

Participants

What are the possible reasons they are not participating?

Participants

What are the possible reasons they are not participating?

Participants

What are the possible reasons they are not participating?

Participants

What are the possible reasons they are not participating?

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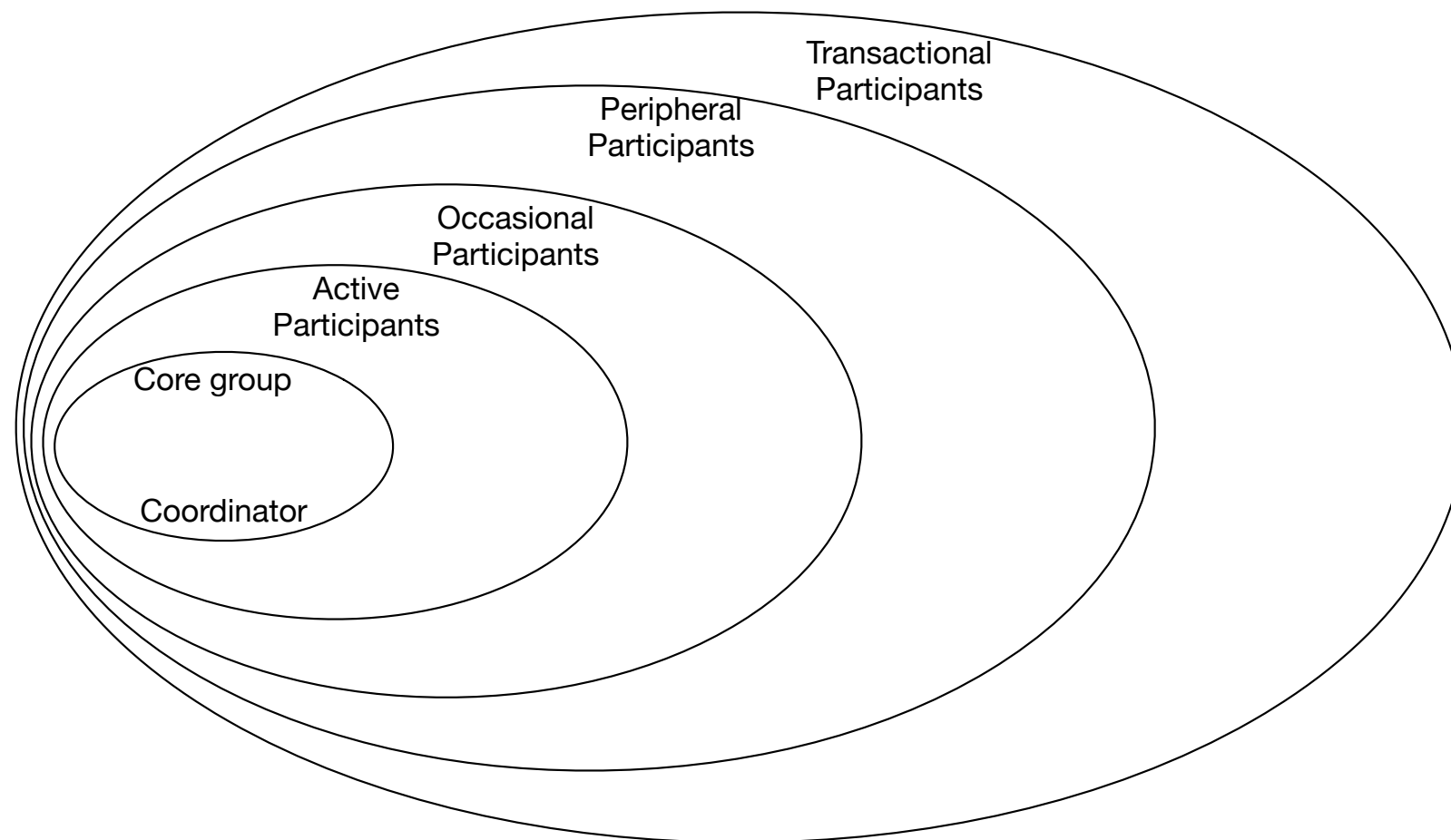
How could you support forms of participation which take account of the contexts and backgrounds of project participants?

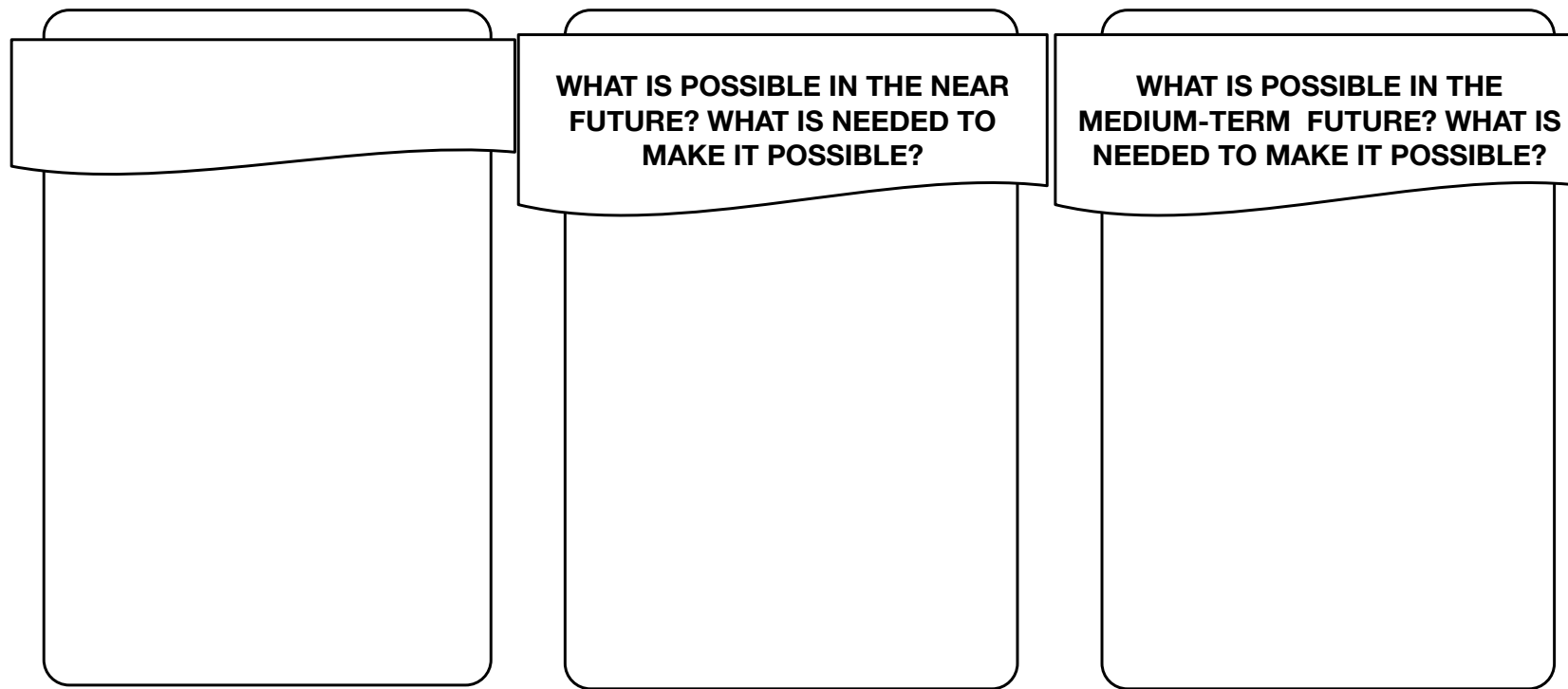
How can power and privilege be more fairly shared within the citizen science project?

How can you strengthen distributive justice among the different types of professional and voluntary participants in the project?

How do different economic and social backgrounds enable or constrain participation in the project? and what can be done to enable more fair forms of participation?

Types of Participants





FOURTH LEVEL: KNOWLEDGE OF WHAT CHANGE CAN REALISTICALLY BE ACHIEVED IN THIS PROJECT CONTEXT

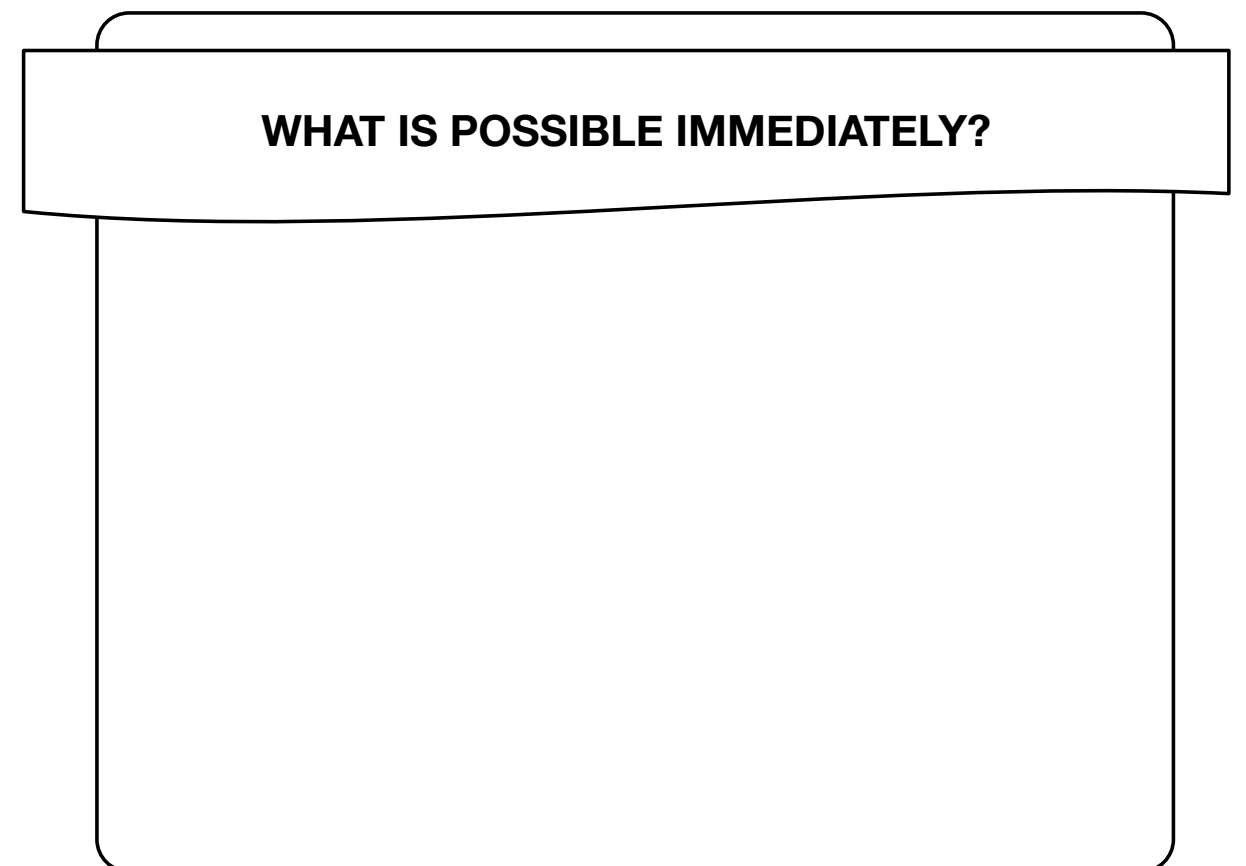
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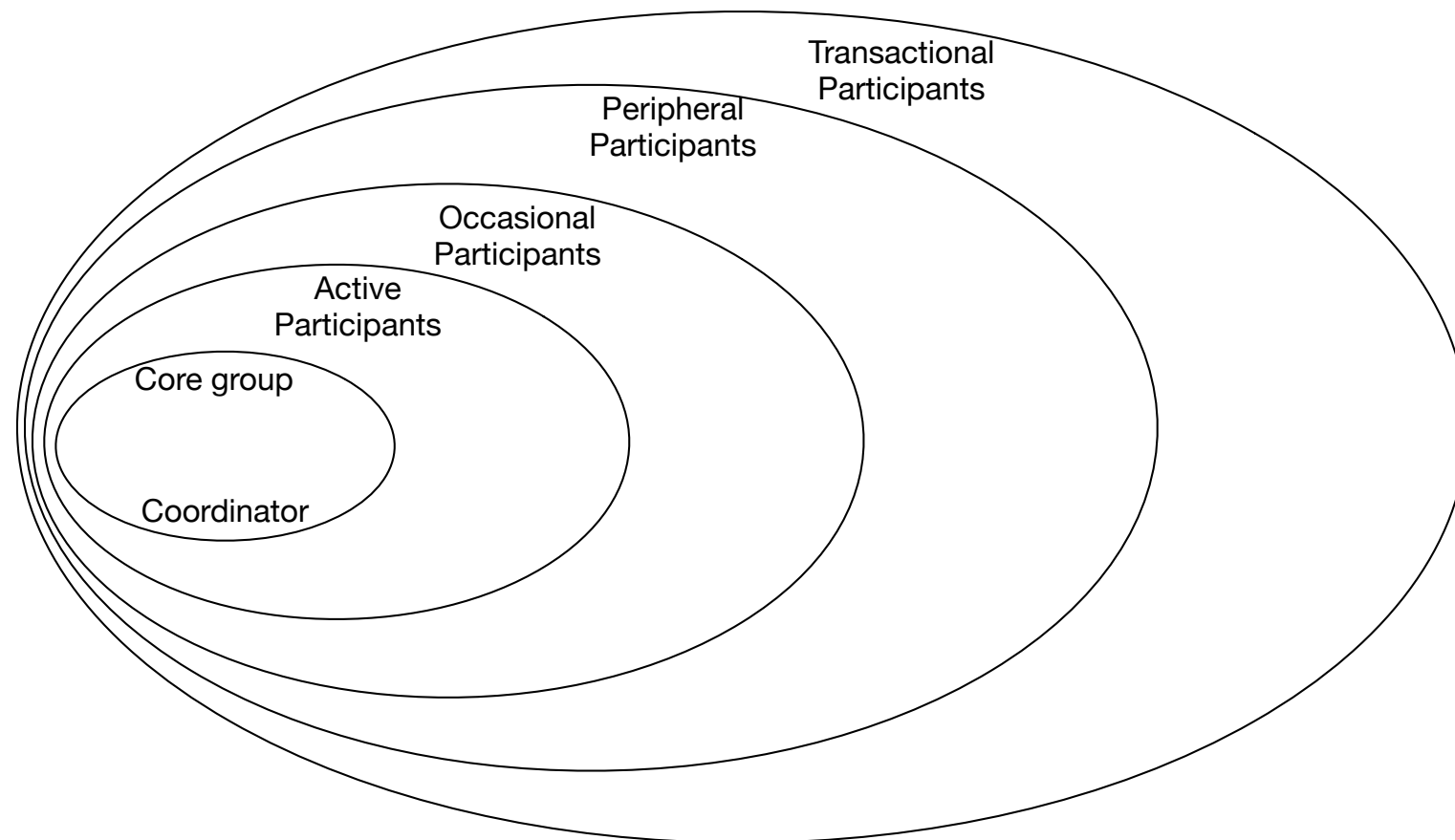
This level allows us to test out ideas and aspirations identified in earlier levels.

This level is based on the idea that reasonable knowledge and insight into what is ethical leads to a stronger supported capacity for practical human agency; through this more empowered perspective, there is a stronger basis for change in the 'world' of the citizen science project.

At this level, it is important to consider the realities of your project's specific contexts and resources, both currently, and in the medium-term future.



Types of Participants



NOTES

PRACTICES & PROCESSES

CITIZEN SCIENCE PROJECTS AS ACTIVITY SYSTEMS

A citizen science project can be understood as an **activity system** with a specific **purpose or cause**. To guide us in identifying the practices of the activity system, we will use an activity system template to tease out the various parts and define practices in terms of these parts.

Subject refers to the citizen science participants

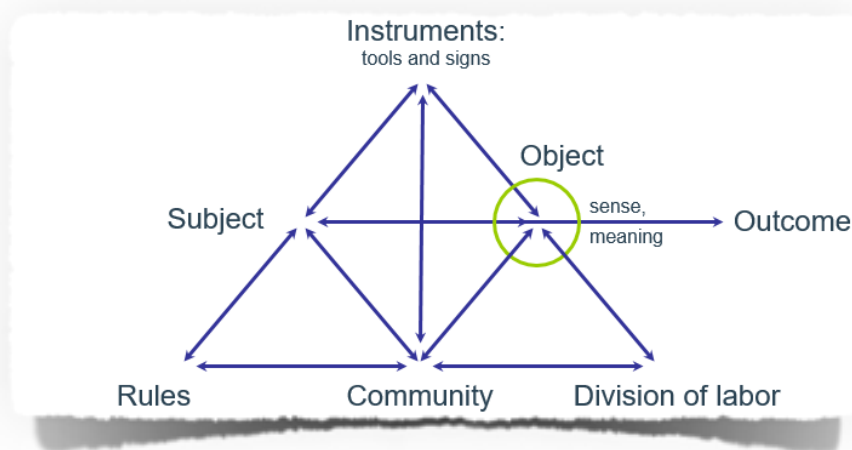
Object refers to the problem space at which the activity is directed.

The object is turned into **outcomes** with the help of **instruments** (tools and signs).

Community comprises the individuals and subgroups who share the same general object.

Division of labor refers to the tasks and vertical division of power and status.

Rules refer to the regulations, norms, conventions and standards that constrain actions within the activity system.



Source: Engeström, Y. (1987). Learning by expanding: An activity-theoretical approach to developmental research. Helsinki: Orienta-Konsultit. (available online at: <http://lchc.ucsd.edu/MCA/Paper/Engestrom/expanding/toc.htm>)

CO-ENGAGEMENT can help identify challenges, inform present and future practices and build common knowledge

I.e. all areas of the initiative are encouraged to get together and create open communication regarding issues that arise

Co-diagnosis

Choose a current issue or challenge the initiative faces (whether collectively or a part of one component):

- Does it hinder activity/practices? If so, how?
- Does it affect participation/involvement in the initiative? If so, how?
- Does it affect the shared interest? If so, how?

Co-design

Brainstorm a few ways this challenge can be addressed:

- What is needed in order to address this particular issue?
- Who can help?
- What resources are needed?
- What methods would best suit your initiative?
- In what ways can this issue be resolved sustainably?

Co-act

Share all the ways of taking action around the shared interest:

- What actions are taken across the initiative? (direct and indirect)
- Do participants work across multiple areas of practice/ action taking? If so, how?
- How are multiple practices monitored across the initiative?
- What do participants learn through taking action?

Evaluation through co-learning

Share how this process is reflected upon and how this may inform future practices and build common knowledge:

- What is your evaluation/reflection method?
- Is it continuous or once off?
- How do you monitor and reflect on the following:
 - ◇ The interconnectedness of a vast network of relationships
 - ◇ Individual and collective work
 - ◇ Cyclical real time feedback from multiple avenues
 - ◇ Partnerships

Taking care of your shared interest together through co-engagement:

Identification
Creation
Action
Reflection
Evolution

This heuristic can be used to stimulate discussion, support co-engagement within multiple areas of a citizen science project, and to encourage new ways of thinking about practices and negotiating social boundaries.

This activity encourages a wealth of interrelations between diverse participants and stakeholders and provides openings to think about the value of the diverse opinions, perspectives and voices and their potential contributions to a project.

- ¥ **Co-diagnosis** – Participants reflect, question and implement practices within a local context. It is an important analysis of ones own practices and a process of identifying shortfalls or challenges within various areas of the initiative that may hinder practices/activity or participation.
- ¥ **Co-design** – Participants can build on capabilities, collaborative skills and can problem solve for contextual challenges. This helps develop and inform practices as well as self-confidence in the involvement of the project. The process of co-designing is a continuous, flexible and adaptable process and requires input across the entire Landscape.
- ¥ **Co-learn** – Participants begin to share information, acquire knowledge, identify issues and potentially change their behaviour according to what they have learnt. This evaluation process can provide guidance in informing activity and future practice.

Co-engagement (I CARE):

- **Identification** – Diagnosing and identifying where there are shortfalls, gaps and issues (co-diagnose)
- **Creation** – Designing new ways of addressing issues collectively (co-design)
- **Action** – Working within and across practice and potential gaining local an relevant knowledge (co-act)
- **Reflection** – Evaluation, reflexive practice, understanding others and their practices (evaluation through co-learning)
- **Evolution** – This process allows initiatives to try new things, work across new areas and challenges, be open to communication, take part in workshops, innovative ideas and brainstorming. This is gradual and sustainable development of something new by learning from before (sustainably transforming practice)

(Source: Alexander (in press), drawing on Armstrong (2013))

PRACTICES

<p>WHICH PRACTICES CURRENTLY OCCUR?</p>	<p>WHICH PRACTICES ARE CONSTRAINED?</p>	<p>WHICH PRACTICES ARE ABSENT?</p>

TYPES OF ACTIVITY

<p>WHICH TYPES OF ACTIVITY ARE CURRENTLY ENGAGED IN?</p>	<p>ARE ANY ACTIVITY FORMS CHALLENGING OR CONSTRAINED? WHY IS THIS SO?</p>	<p>WHICH FORMS OF ACTIVITY ARE ABSENT?</p>

**FIRST LEVEL: KNOWLEDGE OF BEING
(knowledge of what is and what it not)**

At this stage, it is useful to identify the range of practices and processes, and forms of activity within a citizen science project.

Here, we take a realistic view of what is in place and think through what is negative or absent that we would like to have in place. It is also useful to think about how and why particular types of practices, activities and processes are present or absent within a project, and which practices and processes are in privileged or seen as more legitimate than others.

Which types of practices are supported within your project? Which are not?

Which forms of co-engagement contribute to the project?

CO-ENGAGEMENT

<p>WHICH FORMS OF CO-ENGAGEMENT ARE PRESENT?</p>	<p>WHICH FORMS OF CO-ENGAGEMENT ARE PRESENT?</p>	<p>WHICH FORMS OF CO-ENGAGEMENT ARE ABSENT?</p>

What possibilities are there for changing practices or introducing new practices to lift or ease constraints?

SECOND LEVEL: KNOWLEDGE OF WHAT COULD BE AND WHAT COULD BE DONE DIFFERENTLY

This level is about considering possibilities. It provides a space to open up the imagination and, envision possibilities and expand aspirations. This level allows us to consider what is possible in an ideal context or world.

Here, we aim to actively 'absent' those structures, systems or contextual challenges that limit or constrain what we do and how we do it. We propose alternatives, expansions and potentials, rooted in the first level (what is, and what is not).

Consider:

What are the possibilities for introducing, strengthening or integrating systems of commoning?

How could your current practices and processes be supported differently, or more deeply?

Ideally, what types of activity would you need to strengthen your project, and deepen project impact?

What possibilities are there for introducing new forms of activity or for transforming existing activities and processes?

What are the possibilities for integrating or enhancing practices which foster and support co-engagement?

What are the ethical implications the practices identified in levels 1& 2?

THIRD LEVEL: KNOWLEDGE OF THE IMPLICATIONS OF OUR CHOICES FOR OURSELVES, OTHERS AND THE MORE-THAN-HUMAN WORLD

In this level, we centre ethics and values - all of the present and absent practices and processes noted in level 1, and all the possibilities that were identified in level 2 are considered in terms of their ethical implications.

Implications for the individuals, the project, others, the earth and the web of life are all considered. We think about notions such as Ubuntu and Fairness. Here, the idea of what contributes to *the common good* is at the heart of ethical considerations. We also consider which forms of actions and activities related to knowledge *would count as commoning*.

Consider:

How could you support forms of activity which contribute to the common good and become commoning activities ?

How can processes of co-engagement contribute to and enhance commoning within the project?

How can project activities, practices and processes be aligned to support and contribute to deliberative, participatory or radical democracy, and to distributive and cognitive justice?

What are the ethical implications related to the forms of activity identified in levels 1 & 2?

What are the ethical implications of forms of co-engagement identified in levels 1 & 2?

Which changes in practices are realistically possible and ethically acceptable in the current project context?

FOURTH LEVEL: KNOWLEDGE OF WHAT CHANGE CAN REALISTICALLY BE ACHIEVED IN THIS PROJECT CONTEXT

At this level, we consider what is practical right now, in the current context of the citizen science project. We also consider what is practical and possible in the near or medium-term future.

Here, we identify concrete actions that are informed by the three earlier levels. It is about identifying real (ethical) possibilities and taking action based on those possibilities.

This level allows us to test out ideas and aspirations identified in earlier levels.

This level is based on the idea that reasonable knowledge and insight into what is ethical leads to a stronger supported capacity for practical human agency; through this more empowered perspective, there is a stronger basis for change in the 'world' of the citizen science project.

At this level, it is important to consider the realities of your project's specific contexts and resources, both currently, and in the medium-term future.

Which changes in activity are realistically possible and ethically acceptable in the current project context?

Which forms of co-engagement are realistically possible and ethically acceptable in the current project context?

NOTES

THE COMMON GOOD

**CAUSES &
PURPOSES**

**POLICY
LANDSCAPE**

KNOWLEDGES

**PARTICIPANTS &
PARTICIPATION**

**PROCESSES &
PRACTICES**

**How DO YOU
CURRENTLY
contribute to the
Common Good
through commoning
in each of these
areas?**

**CAUSES &
PURPOSES**

**POLICY
LANDSCAPE**

KNOWLEDGES

**PARTICIPANTS &
PARTICIPATION**

**PROCESSES &
PRACTICES**

**How COULD YOU
contribute to the
Common Good
through commoning
in each of these
areas?**

DEVELOPING A SIMPLE SOCIAL PROTOCOL

Eight principles to guide how citizen science initiatives can build common knowledge and strengthen collaboration and co-engagement

	Guiding principles	Ways citizen science initiatives can build common knowledge	Social process benefits
1	Manage practice around the shared interest	Clarify the shared interest across the diverse groups involved and maintain the purpose of the collective work around both short and long term goals.	Allows for multiple agendas, perspectives and goals to be sustained around the same central driving force of the initiative
2	Maintain joint goals of the initiative	Take into account the micro and macro context of the shared interest to understand the complex challenges as a whole.	Allows all aspects and members of the initiative to be included, involved and to contribute.
3	Engage in and across multiple practices	The project can learn through co-engaging with a variety of participants across multiple practices: both professionals and volunteers.	Enhances contextually relevant, ground-up collaboration and co-engagement.
4	Engage in reflexivity of practice and reflection	Maintain open communicative channels between all members where questions can be asked, answers be shared and multiple understandings can be consolidated.	Encourages discussion and evaluative practice. Creates space where boundaries can be acknowledged future practices informed. This will encourage a greater understanding across diverse values, perspectives and motivations regarding the shared interest.
5	Engage in shared knowledge production	Create on-going collaborative work through collective educational activities around the shared interest. Constantly share collective information between all entities of the initiative.	Enhances open communication, varied ways of knowledge-production and encourages learning across the LOP where all areas contribute.
6	Establish methods to build cohesiveness	Collectively create and develop applicable tools and platforms to encourage collaboration and connectivity (i.e. website, scientific protocol, communicative channels)	Creates standard protocols across the initiative and supporting guidelines that helps standardised practice around the shared interest.
7	Establish joint learning processes	Create and maintain areas of co-engagement (co-diagnosis, co-design, co-learning and co-evaluation) to inform joint practice and negotiate boundaries that arise.	Allows for the initiative to be responsive and flexible in practice and receptive to change. Encourages multiple entities to work together to bring about change where needed.
8	Maintain awareness of boundaries that limit practice	Constantly identify challenges that arise through communicating individual and collective issues around the shared interest. Maintain areas of co-engagement across boundaries.	Encourages reflexive engagement across boundaries, which creates new learning potential where participants engage across complex practices, institutions, power dynamics and capacity constraints.

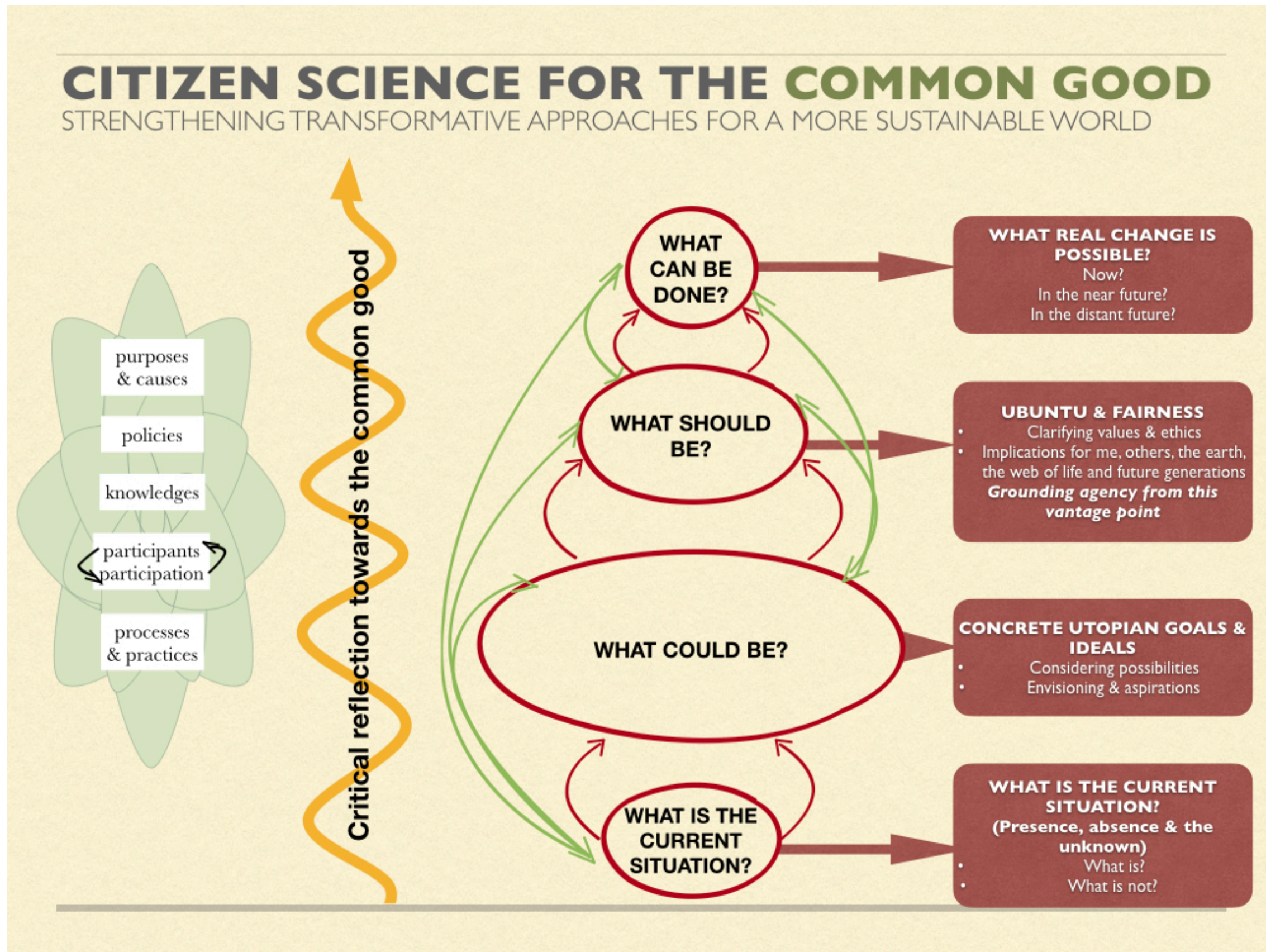
Source: Alexander (in press)

Eight principles to guide how citizen science initiatives can build common knowledge and strengthen collaboration and co-engagement

Guiding principles	What can be introduced to enhance and generate common knowledge, collaboration and co-engagement?	How does this inform practice, negotiate boundaries and support the project goals?
Manage practice around the shared interest		
Maintain joint goals of the initiative		
Engage in and across multiple practices		
Engage in reflexivity of practice and reflection		
Engage in shared knowledge creation		
Establish methods to build cohesiveness		
Establish joint learning processes		
Maintain awareness of boundaries that limit practice		

Source: Alexander (in press)

SUMMARY OF THE LAB PROCESS



RESOURCES & REFERENCES

RESOURCES

You can access our resource website here:

<https://citizensciencelab.weebly.com>

On the site, you will find:

- A blank copy of this workbook
- Links to various documents and papers we mentioned during the lab
- A copy of our Lab presentation
- Links to other resources we thought you might be interested in

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