Supplementary Item S3 – Appendices

# Appendix A: Complete and revised 3D framework

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The complete and revised 3D framework overview shown above, includes the network leadership roles and practices resulting from the current study, as well as the framework elements constituting transformative capacity and impact, resulting from our previous study (Strasser et al., 2020).

The three layers and dimensions constitute an agency-oriented analytical lens for investigating and informing how social innovation actors can be empowered to contribute to transformative institutional changes. That is, the 3D framework can guide analytical inquiry as well as strategic action by pointing out recurring patterns of (1) network leadership roles and practices that a variety of actors in social innovation networks perform to strengthen the development of (2) widening, deepening, and lengthening capacities, whereby SI networks can achieve (3) more wide-spread, fundamental and long-lasting institutional changes. For example: co-organizing conferences with partner networks, offering courses and trainings, and coordinating research and advocacy projects are network leadership practices that can enable the spread and adaptation of social innovations across the world (widening), while also working towards changes in policies and mental models (deepening) and generating resources and resilience that support continuity of the efforts of social innovators and the institutional changes they seek to achieve (lengthening).

A key factor in determining the extent to which transformative capacity can be developed and enacted is the agency driving transformative innovation (Loorbach et al., 2020). TSI theory views agency as a distributed process that is co-produced through interactions of various actors through co-evolutionary dynamics (Avelino, Dumitru, et al., 2019; Avelino, Wittmayer, et al., 2019). A central proposition of TSI theory is to understand agency of social innovation through the lens of ‘translocal networks’ (Avelino, Dumitru, et al., 2019; Pel et al., 2019), where local SI initiatives are rooted in their immediate cultural and geographical context, yet also embedded in networks of related initiatives in other places and contexts. Such networks serve key functions for the empowerment of SI actors, which can be understood as “the process through which actors gain the capacity to mobilise resources to achieve a goal”, including access to human, material, financial and psychological resources, as well as the willingness and confidence to mobilise those resources (Avelino, Dumitru, et al., 2019, p. 1). TSI theory highlights that SI initiatives can be both empowered and disempowered to act on their transformative ambitions by means of this embeddedness in networks, as well as their interactions with enabling or constraining context conditions (e.g. cultural, political, economic) (Avelino, Dumitru, et al., 2019; Avelino, Wittmayer, et al., 2019). While our focus is mainly on empowerment of translocal networks, we also briefly reflect on disempowering dynamics in the discussion.

# Appendix B: Original version of network leadership roles and practices

In the original version of the 3D framework (Strasser et al., 2019), we differentiated between learning processes and network leadership roles as separate layers in the 3D framework – as summarised in the table below. We chose to remove learning processes as an extra layer, as we found it to be more essential to describe directly how network leadership roles and practices contribute to widening, deepening, and lengthening capacities, without explaining which type of learning is involved in the process.

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| **Learning processes** | | | |
| **Practicing and Experimenting**  Learn by doing, reflecting on experience, and envisioning pathways towards more desirable systems | **Exchanges**  Exchange among peers, and with other actors in the SI field | | **Monitoring and Evaluation**  Collection of and reflection on internal data & context developments, as well as critical self-reflection |
| **Network leadership roles** | | | |
| ***Creating conditions and contexts*** | | ***Initiating and supporting activities*** | |
| **Hosting spaces for interaction**  Creating or organizing physical spaces and virtual platforms | | **Facilitating workshops and gatherings**  Regional or international network gatherings, smaller sub-group meetings, online meetings, conferences | |
| **Community building**  Organizing communities of practice and building and navigating boundaries | | **Offering direct support**  Helping people to learn about how to enact and adapt the social innovation in specific contexts | |
| **Integrating autonomous experimentation with network learning and cohesion**  Promoting an experimental culture in local initiatives and spreading learnings while safeguarding coherence | | **Creating and disseminating knowledge objects**  Producing and escorting good practice documents, guidelines, FAQs, literature, videos, wikis, books | |
| **Shaping network features**  Influencing the kind and quality of relationships and information flows, governance, and sub-structures | | **Conducting educational activities**  Workshops, retreats, learning journeys, (online) courses | |

# Appendix C: Interviewees

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| **Interviewee number** | **Organisation and role** |
| 1 | ECOLISE staff and GEN Europe board member |
| 2 | Former ECOLISE staff |
| 3 | GEN Europe member and GEN International member |
| 4 | GO Movement coordination assistant and SOS staff member |
| 5 | ECOLISE staff and Transition Network project officer |
| 6 | SOS board member and co-founder |
| 7 | Transition Network staff member |
| 8 | Green Office Movement coordinator and SOS staff |
| 9 | Former ECOLISE staff |

# Appendix D: Revisions and ratings of network leadership roles and practices

Note: Total number of case ratings = 11. A 5-point Likert scale was used for the ratings: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. *Recognisability* = "I recognise this role as congruent with practices performed in my network"; *Importance* = "This practice plays an important role in contributing to capacity-development in the context of my network". *Average* valuesare the total ratings divided by the number of case ratings. *Range* values are the differences between highest (5) and lowest ratings (1) for recognisability and importance, and therefore expresses the degree of dis/agreement between respondents (0 = high agreement, 4 = low agreement). Ratings marked in bold text indicate values of 3.8 or above for recognisability and importance.

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| **Roles** | **Practices**  (\* indicates practices rated 3.8 or above on average for recognisability and/or importance) | **Recognisability** | | **Importance** | |
| Average | Range | Average | Range |
| **R1. Platform host** enables virtual asynchronous communication | \*P1.1. Setting up virtual communication platforms | ***4.3*** | *2* | ***4.4*** | *1* |
| \*P1.2. Curating platform content and participation | ***4.1*** | *2* | ***3.9*** | *2* |
| **R2. Illuminator** makes initiatives and solutions visible | P2.1. Mapping networks | *3.3* | *3* | *3.2* | *2* |
| \*P2.2. Showcasing solutions | ***4.6*** | *1* | ***4.5*** | *2* |
| **R3. Community weaver** brings people together to learn and support each other | \*P3.1. Building translocal communities of practice | ***4.1*** | *3* | ***4.3*** | *3* |
| P3.2. Bridging across communities of practice | *3.4* | *3* | *3.7* | *3* |
| **R4. Partnership broker** brings organisations together to act collaboratively | \*P4.1. Convening and building cooperative relations among diverse organisations | ***3.8*** | *3* | ***4.2*** | *3* |
| \*P4.2. Aligning partners for cohesive collaboration | *3.6* | *3* | ***3.8*** | *3* |
| \*P4.3. Coordinating multi-level network structures | ***4.2*** | *2* | ***3.8*** | *3* |
| **R5. Strategic organiser** clarifies what to achieve and how | P5.1. Analysing societal systems | *2.5* | *4* | *3.1* | *3* |
| \*P5.2. Co-shaping network strategies | ***3.8*** | *3* | ***4.0*** | *3* |
| \*P5.3. Co-evolving internal network governance | ***4.2*** | *1* | ***4.3*** | *1* |
| **R6. Event organiser** hosts spaces for inspiration and interaction | \*P6.1. Designing and facilitating events | ***4.5*** | *3* | ***4.6*** | *2* |
| \*P6.2. Curating participants and contributors | ***3.9*** | *2* | ***4.2*** | *2* |
| \*P6.3. Harvesting and sharing outcomes | ***4.1*** | *4* | ***4.2*** | *2* |
| **R7. Knowledge weaver** builds evidence base and practical know-how | P7.1. Generating and analysing data | *3.2* | *4* | *3.5* | *3* |
| \*P7.2. Producing and promoting knowledge resources | ***4.1*** | *3* | ***3.9*** | *3* |
| \*P7.3. Organizing and curating knowledge resources | ***4.1*** | *3* | ***4.3*** | *2* |
| **R8. Evaluator** strengthens accountability towards members, funders and purpose | P8.1. Measuring activities and achievements | *3.1* | *3* | *3.5* | *2* |
| \*P8.2. Supporting critical reflection | *3.5* | *3* | ***4.1*** | *2* |
| **R9. Enabler** builds capacity for effective action | \*P9.1. Conducting educational activities | ***4.2*** | *3* | ***4.1*** | *4* |
| P9.2. Offering practical guidance | *3.7* | *2* | *3.6* | *2* |
| **R10. Advocate** promotes structural and cultural change | \*P10.1. Clarifying and mobilizing support for systemic changes needed | *3.5* | *3* | ***3.9*** | *3* |
| \*P10.2. Shaping policy and discourse | *3.5* | *3* | ***3.9*** | *3* |
| **R11. Resource provider1**  generates and enables access to resources | P11.1. Acquiring funding for organisations supporting networks | *n/a* | *n/a* | *n/a* | *n/a* |
| P11.2. Distributing resources to support target groups | *n/a* | *n/a* | *n/a* | *n/a* |

(1 R11. was added after the interviewees, so this role was not rated)

We refined the network leadership roles, as they were described in the original version of the 3D framework (Strasser et al. 2019), in the following ways. We chose to use labels (e.g., *Platform host*) instead of verbs (hosting platforms) to describe the refined roles in a more pointed way, and to include brief descriptions of the purpose of each role. Four roles were added, based on the case observations and interviews: *R2. Illuminator*, *R4. Partnership broker,* *R10. Advocate, and* *R11. Resource provider*. One role in the original framework was deleted: *Integrating autonomous experimentation with network learning and cohesion*. This was seen as too abstract, while the practices supporting learning and cohesion are performed by other roles, such as *R7. Knowledge weaver* and *R9. Enabler*. We also removed the distinction between *Creating enabling conditions and contexts*, and *Initiating and supporting activities* asoverall categories for the network leadership roles, as we found many inter-relations among the roles that make the distinction rather insignificant. We moved the practice *P5.1. Analysing societal systems* to *R5. Strategic organiser* after initially placing it under *R2. Illuminator* in the first iteration of refinement. The low recognisability ratings and interviewees made it clear that this practice was more about gaining a strategic orientation for interventions, which can involve using systems analyses of scientists or other organisations or offering tools for initiatives to make baseline assessments of their local context in the initiation phase. The ratings for this practice may differ after this modification.

Interviewees perceived a few gaps in the list of roles and practices. Interviewee 2 suggested to add the role of “care work” as a highly important role that is however “completely lacking recognition”. This refers to the people (often females) who are caring for long-term relationships by supporting emotional wellbeing and repairing broken relationships. This was perceived as “often invisible, behind the scenes work, but what keeps networks together […] If you’re not caring for each other, at some point everyone's burning out because everyone's working beyond their capacity […] it's about making sure nobody is feeling left out, everyone's voice is heard, that people aren't feeling demotivated.”As this role was not explicitly identified in other case observations or interviews (which may be an implicit bias of the first author), we did not include it as an extra role in the revised framework. We did include a practice example of care work under *P.1.2. Curating platform content and participation*, for we did observe that one of ECOLISE’s members invited people to share about their feelings and sense of well-being in a “heart” channel on their internal Slack communications platform.

Interviewee 5 further suggested to include an extra role for generating and distributing resources for a network. We initially considered generating resourcing as a ‘challenge’ rather than a stand-alone role, however prompted by this interviewee, and confirmed by Interviewees 2, 4 and 7, we saw that this role indeed deserves to be identified as an additional role. We therefore included *R11. Resource provider*, and the related practices in the revised framework: *P11.1. Acquiring funding for organisations supporting networks* includes generating income from membership fees, paid services like workshops or online courses, foundation grants and/or funded research projects; *P11.2. Distributing resources to support network members* is exemplified by Transition Network’s provision of "seed funding" (Interviewee 7) to help the initiation of Transition groups in areas where there are few initiatives so far.

The relatively high variability for many of the ratings suggest that the recognisability and importance depend on the case characteristics and subjective perceptions of respondents. One interviewee rated recognisability from the perspective of whether they perform a practice in their own daily work, while the others from the perspective of seeing a practice performed more generally in their organisation or network. Two respondents rated recognisability and importance low in the context of their specific organisation, while they generally saw them as recognisable from experiences in other organisations. Finally, some interviewees rated importance more generally (“they are all important”, Interviewee 7), while two were stricter in their ratings by considering importance in light of their resource constraints. We also noticed that slight changes in wordings during interviews influenced the interpretations and ratings of three interviewees, who expressed difficulties with understanding some of the terminology. Considering the relatively small number of interviewees and cases, the ratings may have limited validity in different case contexts. Considering variability of ratings among respondents from the same case, the rating results may also differ when asking more or different people from the same cases. Despite these limitations of rating variability, we consider the results sufficient for the purpose of validating the revisions of the 3D framework and enhancing its practical value.

# Appendix E: Challenges for network leadership

Note: Total number of case ratings = 7. A 5-point Likert scale was used for the ratings: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. *Recognisability* = "I recognise this challenge as congruent with challenges encountered in my network"; *Importance* = "This challenge plays an important role in hindering capacity-development in the context of my network". *Average* valuesare the total ratings divided by the number of case ratings. *Range* values are the differences between highest (5) and lowest ratings (1) for recognisability and importance, and therefore expresses the degree of dis/agreement between respondents (0 = high agreement, 4 = low agreement). Ratings marked in bold text indicate values of 3.8 or above for recognisability and importance.

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| **Network leadership challenges**  (\* indicates challenges rated 3.8 or above on average for recognisability and importance) | **Recognisability** | | **Importance** | |
| Average | Range | Average | Range |
| **Creating alignment across multiple levels of networks**   * Clarifying which network leadership roles are best performed at which level of a network (local, national, regional, global, meta-network) * Effectively coordinating activities across these levels while allowing sufficient degrees of autonomy for self-organised activities | ***3.9*** | *3* | *3.3* | *3* |
| **\* Staying rooted in the local while operating at translocal scales**   * When operating at translocal scales, network leadership can become removed from actual experiences and needs of local actors | ***4.0*** | *3* | ***4.1*** | *2* |
| **\* Reaching and meaningfully engaging network members**   * Often only a small percentage of members are continuously and actively engaged in network activities, while a majority focus on their own activities * Many people feel overwhelmed by too many events, platforms, newsletters, which can make it difficult to reach network members * Ensuring continuity of participation as people enter and exit at different times * Going beyond individual participation to form teams among network members | ***4.9*** | *1* | ***4.4*** | *2* |
| **Supporting embodiment of core values in how the governance and culture of the network**   * Practicing good intentions and integrating values like trust, diversity, equity into values-aligned processes for decision-making, financial management, etc. * Balancing innovative and experimental ways of organizing with formal accountability requirements | ***3.9*** | *2* | *3.6* | *4* |
| **Integrating various interventions and organisations into a coherent transformative ecosystem**   * Actors from multiple networks organizing similar activities compete for attention of the same target group * Systemic intervention approaches areunderdeveloped,whichidentify and organise activities around strategic initiatives that address systemic leverage points, based on scientific systemic analysis | *3.7* | *3* | *3.3* | *4* |
| **Staying aligned with the core purpose of the network when collaborating with and receiving funding from mainstream actors**   * Working on funded projects drawing capacity from a network’s core team into funded projects can bring the risk of fragmentation where everyone is only focused on their own project delivery and losing sight of the collective purpose of the network | ***4.0*** | *3* | *3.7* | *4* |
| **Designing scalable transformative learning infrastructures**   * Creating enabling support offers that can reach a large number of people, while still engaging them in a deep, transformative learning process, especially with online activities where it’s more difficult to build personal and lasting relationships | ***4.1*** | *3* | *3.1* | *4* |
| **\* Collaborating across diverse networks for coherent action**   * Engaging with marginalised groups, environmental and social justice activists, indigenous groups | ***4.0*** | *3* | ***4.5*** | *1* |
| **\* Resourcing network operations**   * Acquiring funding for network organisations that are aligned with their needs and ambitions for transformative action, not just short-term projects, which allow sufficient flexibility to adapt goals and strategies over time * Given small budgets, many people performing network leadership roles work on insecure employment conditions or spend much time volunteering next to other paid jobs, making them overworked | ***4.1*** | *3* | ***4.4*** | *1* |

Additional challenges identified in interviews

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| **Dealing with accountability in networks**   * “within meta networks, like with NGOs [...] and the civil society sector, I’ve been seeing for years, there's no accountability whatsoever … who is your accountability towards, if you're working within a network that's more professionalised? Is it just to your members, towards those who you're collaborating with? It's not just accountability to funders [...] Within the corporate structures, there's accountability at each level, you know exactly what the procedure would be, if something goes wrong [...], within civil society organisations that doesn't exist.” (Interviewee 2) * “Networks can be missing the bigger picture at times by being too focused on what members want. This can bring about tensions between being a network but also leading the network and being accountable to the network. That can be a constraining role. The question is about widening while being constrained by the self-serving nature of networks”. (Interviewee 9) * “unless you're thinking about how you stay connected to the outside world and what your real values are and how you're adapting to the emergent change in society, you're going to remain insular and soon become irrelevant. You'll end up becoming cults.” (Interviewee 2) |
| **Connecting with struggles of oppressed social groups and addressing equity, diversity, and inclusion in a meaningful manner**   * In community-led initiatives “the understanding of struggle is very different, and I would say across the climate movement in the Western world, people coming from the Global South have a very different understanding of what it means to be struggling and fighting for survival and rights […] for people of colour, doing climate activism and doing any kind of activism isn't a cause that we're joining. It's a matter of survival […] that's a nuance, which is very difficult to explain, but I feel like people are like, yes, we're being sustainable. Yes, we're being climate friendly […], but it's still not connected to any real struggle within your context” (Interviewee 2) * “So having these models that should be implemented, but without being really deeply connected to the struggles, there's a surface level analysis. For me if you're not connected to the struggle, then your analysis can't be as deep. It can be wide, but it can never be deep, because you're not bringing in the experiences of the people connected to the struggle. […] if you're talking about justice and you're not talking to the most impacted, then what justice are you talking about, and from for whom, who is this justice for then? So for me, these kind of scalable models end up being very problematic if they're not rooted in struggle. Then your striving for justice is going to be just a justice for some and not for all. […] And that's why care, and caring is central. And that's why we have to recognise people who do the care work, because that's the only way to get rid of systems of oppression, is to rebuild systems and organisations and communities and movements that put care at the centre so that we don't lose people along the way.” (Interviewee 2) * Going beyond good intentions to meaningfully empower marginalised groups: “Engaging marginalised communities is real challenge. How do you engage with people in meaningful way where they’re empowered, without it being tokenistic?” (Interviewee 7) * “You have to build the capacity of the whole team to understand the language and the struggles of other social justice movements. In theory people think it’s great to have diversity, but what’s needed to get to there, for example doing work on white supremacy and how is it showing up in our networks, how to speak to people who have been through racialised experiences we can’t relate to. It takes a lot of sensitivity and understanding to do that. These capacities need to be very well developed and that takes a lot of time. So widening is not just ‘I have an interest to work with a person who’s different’, It’s really about trust you need to have built with a person who has faced injustice and discrimination, which means you have to do a lot of self-work to get to that point to be able to have that conversation. I think it’s a bit pretentious if we think we can just open our doors and think we’ll have different type of members. Why would people want to join a bunch hippie ecovillage people who are middle class white people? If we’re not showing any solidarity with their struggles, or connection with wider struggles of capitalism and power, then I think it’s a bit presumptuous to think that. […] Transformation has to come from the most oppressed groups […] If you have been dehumanised, you have the potential to really understand deeply what it means to be human and you can really start to resist, but also envision alternatives where there is deep compassion and equity placed at the centre, because you have been through how horrific society has treated you. I don’t’ see alternatives as deeply transformative until it gets to a point of understanding power and oppression and making platforms for those group to not just build their own ecovillage but also have a say in how alternatives might look like.” (Interviewee 9) |
| **Addressing internal tensions around power imbalances**   * Internal tensions and conflicts can arise around power imbalances if certain people and perspectives are less visible, valued, influential or able to participate than others (e.g., women, non-white, gender diverse, etc.) * With regards to ‘co-shaping’ network strategies and ‘co-evolving’ network governance, it needs to be made explicit “who is co-shaping whom, who can decide, who has access to data” (Interviewee 2) * “Power has to be addressed somehow […] it gets into the things that are tacit, under the surface. A lot of things in these networks is under the surface." (Interviewee 2) * “‘leadership’ as a very fraught concept in general, because it ends up being power centralised with one person or role, even if the role is held by different people. […] it always invariably ends up happening, that whenever you try to define leadership, even if you don't define it within a role or a function, it somehow ends up getting centralised because that's just the nature of leadership, unless we change how we understand leadership, which is more collaborative than top down or, where we actually differentiate between responsibility and accountability, and the tasks.” (Interviewee 2) |

# Appendix F: Perceived usefulness

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| **Useful applications** | **Quotes from interviewees** |
| Checklist to plan projects and initiate networks | * “It is a really good checklist: it breaks down all the different roles we need to think about for our project.” (Interviewee 7) * “I was positively surprised by the roles, as someone who has been working in networks for a long time, I can identify all of them. It’s the first time I see all these different roles in a classification.” (Interviewee 5) * “I see it useful especially for new networks to think about the types of roles and actions to implement from the start.” (Interviewee 8) |
| Collectively evaluating current performance and setting strategic goals | * “To identify what we did well, could improve, or see as a problem.” (Interviewee 4) * “To have an honest discussion about how much effort we are we putting into these [roles] and to clarify short-term vs long-term goals. To clarify: Where are we now? Where do we want to be? What’s reasonable?” (Interviewee 1) * “To understand better what you’re doing well, where more work is needed and what should have priority for the next 6 months or two years.” (Interviewee 4) |
| Strategically prioritizing allocation of resources and capacities | * “What’s interesting is if the role exists but doesn’t feel important, or if it feels strategically very important but is not well organised. When you have a big difference, you have energy wasted […] It helps to clarify what you want to emphasise, where you want to allocate resources, and to be conscious of where you are putting the resources.” (Interviewee 1) |
| Clarifying which roles are currently performed, which are needed and who should perform which roles | * **“**It could be useful to map the ratings of different member organisations to see complementarities and gaps between what is seen as important but not seen as happening enough or find another network that can contribute to fill that gap. (Interviewee 5) * “I think it's a very good analytical tool to help you understand what role you should be playing within these networks. And those roles are interchangeable, so it can also help you decide what governance structures will fit that best so that everyone can move into different roles at different times.” (Interviewee 2) * “Also, for team development: who’s in the team, which roles do we have represented, which roles do we need or what do we need to learn to perform those practices?” (Interviewee 5) |
| Building a shared understanding of the core purpose and goals of an organisation | * “It would be very helpful to get a group of our staff and, or the council together to focus on what the purpose of the network is and solidifying a clear direction of where to go.” (Interviewee 1) * “To discuss with colleagues: what’s our most important role in the world, are we mainly an enabler, advocates, networkers? What is our core identity?” (Interviewee 3) * “Creating a better understanding of what our role in in larger society, what our leverage points are, where we can have most impact, and how to leverage that impact.” (Interviewee 2) |
| Making agreements and differences in opinions explicit | * “Could be helpful to evaluate and see what everyone else is saying […] to see where some people see things differently.” (Interviewee 1) * “Building a cohesive picture is interesting, or at least understanding that I have a different view than everyone else, that’s also beneficial.” (Interviewee 1) * “It could be helpful to identify blind spots: why do we have no one working on this? This can be an interesting discussion, about why we do or do not see this as important? And the fact that you would need to explain it.” (Interviewee 1) |
| Building understanding of network leadership as a distributed practice | * “People have very different understandings of leadership […] so, it's really good to have some of these practices as examples, so people understand what you mean when you're saying ‘practicing leadership’, and that it's not the role or function embodied in one person.” (Interviewee 2) |