CEBioS

# RESILIENCE

## CONCEPT NOTE



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# Mainstreaming the concept of 'resilience of socio-ecological systems' into a capacity development program for biodiversity in Africa- the case of the CEBioS-programme of the Belgian International Cooperation

## Concept note

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The CEBioS programme is funded by the Belgian International Cooperation and implemented by the Royal Belgian Institute for Natural Sciences in Brussels, Belgium. It aims through six sub-programmes to strengthen the capacities of scientists, civil servants and civil society actors to raise awareness, inform about, manage, conserve and sustainably use biodiversity in partner countries, especially in sub-Sahara Africa and within the framework of the Rio Convention of Biological Diversity (CBD).

Through dedicated calls, mentoring, coaching, trainings and participative and multi-stakeholder workshops, CEBioS implements the following sub-programmes :
(1) Global taxonomy Initiative (GTI) to strengthen scientific capacities of researchers in taxonomy or the discovery and description of new species,
(2) Monitoring of ecosystems and protected areas (MEP) to improve management and monitoring of protected areas and their ecosystem services,
(3) Indicators for Policy (IP) to identify pertinent indicators for implementing and reporting to the Convention of Biological Diversity (CBD),
(4) Communication, Education and Public Awareness (CEPA) to raise awareness about the unique biodiversity and its threats,
(5) Clearing House Mechanism and Policy Support (CHM-POL) to create and maintain national CHM web sites to centralise pertinent biodiversity information for the CBD and do policy supporting interventions,
and (6) Synergies (SYN) to foster collaboration with other actors of the Belgian cooperation on these topics.

CEBioS is a founding member of the Belgian network on resilience of socio-ecological systems, called 'SECORES' and regrouping other founding organizations coming from civil society and dealing with respectively conservation (WWF-Belgium), forests (Bos+), water (Join4Water), education (Via Don Bosco) and mangroves (a consortium of university-linked NGOs called Uni4Coop).

Being active in SECORES to identify with the other member organizations ways to improve the resilience of socio-ecological systems (called "social-ecological resilience" or SER) in the context of their cooperation projects in the Global South, CEBioS tries to mainstream the concept of 'resilience', as complementary concept to the thematics of biodiversity, central to its own approach.

Through active participation in SECORES, CEBioS co-constructed the network in several ways: (1) chairing, participation and inputs into the steering group, (2) conducting with a Master-thesis a field validation in Burundi of a SER tool called 'SEPLS' (see Janssens de Bisthoven et al., 2025), (3) being active in the reflection about gender and inclusiveness related to SER (see Humanya report), (4) having co-created a four-pager about SER (see link), (5) being active in a working group about the scope of SER in international cooperation and the lessons learned, (6) cooperating for a call for mini-projects for NGOs and (7) participating to workshops in the framework of geographical joint strategic frameworks on the thematics of SER (e.g., Burundi, Bénin, RDC).

Internally, CEBioS raised the question together with a number of associated

stakeholders (anthropologists from EU-funded C-Urge programme, funding administration DGD, scientists) on how this concept of SER could be mainstreamed or percolate into its capacity development interventions as an added value to the central thematics of biodiversity.

It is important that awareness of gender and its effects be systematically reckoned with from the start of projects, and any additional issues caused by the intersection between gender and other elements of one's status (for ex. Indigeneity) should be kept in mind. One possible framework for addressing these issues is the Tinker-Tailor-Transform approach (see Humanya report). This presents three possible kinds of action: Tinkering, which means small changes to existing approaches, such as adding women to a selection committee; Tailoring, designing and adapting systems to fit women's needs as well as men's'; and Transforming, which involves a fundamental ground-up overhaul of systems to make them more equitable.

However, important addendums were made in the course of discussing this issue. Pushing for more women's inclusion in local projects can easily end up being both superficial and rather neocolonial. The example of a local partner telling women to go stand at the front of the picture because "Europeans like that" was given. Moreover, there are practical hindrances to achieving gender equity in these projects, such as women's low access to the necessary education in certain countries. Certainly, existing initiatives like the gender strategy and the calls targeted at women should be continued, but these considerations should be kept in mind.

Brainstorming with mind-mapping supported the programme team to better grasp the concept and integrate it in the working modalities of the programme. Socio-ecological resilience can be defined as the capacity to adapt or transform in the face of changes in socio-ecological systems so as to continue to support human wellbeing, in the context of a linked system of people and nature existing in mutual interdependence. In particular, it can be related to the planetary boundaries and the donut approach to social rights. To put it simply, it is about promoting human wellbeing within the boundaries of the planet's boundaries. Although SER frameworks linked to poverty are relatively known from the literature (e.g., Lade et al., 2017), the CEBioS team (biologists, bio-engineers and managers) and associated stakeholders (anthropologists, biologist, funder) found that the concept still remains hard to translate into concrete actions to foster sustainable development linked to biodiversity.

This topic has often been broached by the EU in recent years, with the EU's biodiversity credits and French and German projects around benefit sharing, where community access to ecosystem services is often a central focus. This points to something important: local people and their livelihoods are central in this conversation, and they should see the first benefits.

The UN has also eagerly made use of the concept. However the communication around such matters is not infrequently frustrating and vague. For instance in Tanzania, while many UN projects talk about resilience, what it is the local systems

should be resilient against is often not clearly articulated: market fluctuation, rain patterns, interventionist policies …?

This also highlights the importance of a social justice perspective. It pays to ask who benefits from particular measures and actions and who doesn't. If damage is being done to the local ecosystem, the root causes for this damage should be addressed, not merely the immediate causes. Often issues around biodiversity are discussed on a long term scale: the presence or vanishing of species or ecosystems. But many of the issues people face, and which might indeed prompt them to take decisions that harm the ecosystem, are short-term. People do not care about vanishing fish stocks in the future if they cannot feed their children.

As such it is vital to know the local context in which any projects are being done. In the past, workshops that take into account the specific socio-ecological system of the locale and sought to think within that context have been helpful in concretizing the issue to participants.

Based on a mind-mapping exercise, we propose ex-post to list the main ideas per sub-programme (Table 2) and match them against the SER framework proposed by Sterk et al. (2017). In the present case, 'ex-post' means that the mind mapping was performed without prior knowledge of the framework proposed by Sterk et al. (2017), to avoid any bias. These authors listed seven principles that are considered crucial for building resilience in social-ecological systems (Table 1). This will allow for a systemic deconstruction of the mind-mapping to achieve a better understanding of the SER concept as an added value to CEBioS as a capacity development programme. This can inform and inspire CEBioS and other capacity development practitioners in the field of biodiversity and beyond (e.g., conservation, One Health, Agro-forestry, integrated water management etc …).

**Table 1:** the seven principles proposed by Sterk et al. (2017) to construct resilience of social-ecological systems.

| ID | Principles of SER according to Sterk et al. (2017) | Abbreviation |
|---|---|---|
| P1 | Maintain diversity & redundancy of species, landscape types, actors and institutions | Diversity |
| P2 | Manage connectivity of resources, species and people | Connectivity |
| P3 | Manage slow variables and feedbacks | Feedbacks |
| P4 | Foster complex adaptive systems (CAS) thinking | CAS |
| P5 | Encourage learning by acquiring new information, skills or understanding | Learning |
| P6 | Broaden participation by active engagement of stakeholders in projects | Participation |
| P7 | Promote polycentric governance systems | Governance |

**Table 2:** list of collected ideas informing the 6 sub-programmes and transversal themes of CEBioS on how to mainstream the concept of 'resilience of socio-ecological systems' into capacity development interventions. The right column matches the ideas with the SER framework criteria of Sterk et al. (2017). Some similar ideas were merged. The ideas reflect what CEBioS is doing and what CEBioS can do to promote SER.

| Sub-programme | Nr. idea | Mainstreaming of SER in sub-programmes of CEBioS * | Match with SER principles of Sterk et al. (2017) (Table 1)** |
|---|---|---|---|
| **(1) GTI** | 1 | – Supporting early-career researchers in our partner countries (through calls, scientific articles, etc.) | The ideas collected for GTI are best reflected in:<br>· Diversity<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation |
| | 2 | – Strengthening local scientific networks (CEBioS Alumni) | |
| | 3 | – Promoting women in science (quotas + accompaniment) & fostering gender/inclusion in calls | |
| | 4 | – NEXUS + SER in calls | |
| | 5 | – GTI awareness calls – with local communities | |
| | 6 | – Scientific (research) vs traditional/local knowledge (awareness) | |
| | 7 | – GTI research on taxa used in value chain or ecosystem services and how this can contribute to SER in terms of food security or one health | |
| | 8 | – Knowledge that contributes to sustainable development | |
| | 9 | – motivate match of local students with experts (North or South) using digital tools available or even support digitisation accompanied by training how to use these digital resources | |

*Table 2: continuation*

| | | | |
|---|---|---|---|
| **(2) MEP** | 10<br>11<br>12<br>13<br>14<br>15<br>16<br>17<br>18 | - Link between data and sustainable management -> increase of SER?<br>- Evidence-based management SER in call<br>- SER in buffer zones (projects)<br>- Which value chains in our work<br>- Traditional ecological knowledge: where does it come from? (ie beyond the sciences?) ie Braiding Sweetgrass (Robin Wall Kimmerer)<br>- Do/can local populations step in? monitoring (for ex. Women's groups)<br>- Broader participation (if local communities involved eg). Local traditional knowledge<br>- Ecosystem services conservation (obj. of some projects?)<br>- Considering economic growth & livelihood in a sustainable way | The ideas collected for MEP are best reflected in:<br>· Diversity<br>· Connectivity<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation |
| **(3) CEPA** | 19<br>20<br>21<br>22<br>23<br>24 | - Policy-briefs through participative methods? Policy briefs? Concepts?<br>- SER in call<br>- Communicate about the benefits of SER for beneficiaries and partner countries overall<br>- Can calls be listed in local languages and spread in more areas? Email lists/whatsapp<br>- Supporting communication on the importance of biodiversity within local/popular media, in relation to specific projects/location<br>- Share knowledge on biodiversity to different public | The ideas collected for CEPA are best reflected in:<br>· Connectivity<br>· Feedbacks<br>· CAS<br>· Participation |
| **(4) IP** | 25<br>26<br>27<br>28<br>29<br>30<br>31<br>32<br>33<br>34 | - Formulating policy for sustainable use of NR (fisheries eg)<br>- SER in call<br>- Share understanding on international policies on biodiversity<br>- Promoting polycentric governance (National-local projects)<br>- Include SER component/ perspective/impact/ consequences in training for policy briefs<br>- Medicinal plants (Benin): which ones are vulnerable and how not to impact them/damage them<br>- Indicators of SER<br>- Indicators = alert messages about vulnerable ES/ species/ecosystems -> advocacy for conservation<br>- Sacred forests in Benin: document them, their management and benefits<br>- Burundi: assessing state/extent of marshes (providing multiple ES) + monitoring | The ideas collected for IP are best reflected in:<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation<br>· Governance |

* terms in bold directly refer to the principles of SER
** the two most pertinent principles are put in bold

*Table 2: continuation*

| | | | |
|---|---|---|---|
| **(5) CHM-POL** | 35<br>36<br>37<br>38<br>39<br>40<br>41 | – Encourage learning through sharing of biodiversity information<br>– Awareness calls dedicated to CAM partnership with local organization<br>– Incorporate SER in calls<br>– Print production: can we enhance/professionally instill good practices (CEPA)<br>– Inclusion of partner countries as COP<br>– Global (CBD) governance / application at national level (NBSAPS) --> actions towards not crossing planetary boundaries<br>– What information on the ecosystem health status can be derived from the well-maintained database? Can we add a layer on how resilient the ecosystems are and what should be done to increase that resilience? That could be discussed with experts on this type of statistics. We could think of a way how to implement different management practices in such a tool in line with ecosystem services. These two, CHM and LEXICA, could be linked in this way. Capturing, in such high-profile platform, the capacity of ecosystems to withstand shocks rmains challenging. The SEPLS-tool is a step in that direction. | The ideas collected for CHM-POL are best reflected in:<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation<br>· Governance |
| **(6) SYN** | 42<br>43<br>44<br>45<br>46<br>47<br>48<br>49<br>50<br>51 | - Discussing role and added-value of CEBioS with regards to SER in relevant country CSCs and embassies<br>- SECORES CSC, Officially up to the end of 2026 (CSC)<br>- Workshops on Biodiversity (Pascal B, Rubicom)<br>- Awareness raising activities with local community (unesco mab Yangambi)<br>- Secores more? (in another form?)<br>- Translate lessons learned of Humanya to CEBioS<br>- Symposium<br>- Recognizing SER & selling it (in new project proposals, workshops/conferences, etc.)<br>- Supporting and guiding (from a biodiversity perspective) activities that could economically benefit local communities long-term + partnering with organisations that explicitly do this<br>- Create new partnerships/synergies with actors having the same SER vision (expertise in SER – the social aspect of it) | The ideas collected for SYN are best reflected in:<br>· Connectivity<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation<br>· Governance |
| **Transversal, varia** | 52<br>53<br>54<br>55<br>56<br>57<br>58<br>59<br>60<br>61<br>62 | - PHD on women resilience in Burundi<br>- Learning groups, international learning<br>- SECORES gender meetings<br>- Gender strategy of CEBioS<br>- Promote polycentric governance (MEP vs IP vs CHM Pol)<br>- Articles on SER<br>- Add indicators about resilience in project reports<br>- South-South connectivity<br>- Concept note about SER by and for CEBioS<br>- For gender and politics – maybe meeting beforehand with local interlocutors or ethnographers so projects can already include appropriate means of inclusion<br>- Internal reflection based on reports and projects | The ideas collected for transversal, varia, are best reflected in:<br>· Diversity<br>· Feedbacks<br>· CAS<br>· Learning<br>· Participation<br>· Connectivity<br>· Governance |

# Discussion & conclusions

Overall we observe that principles of SER according to Sterk et al. (2017) apply to each category of interventions within CEBioS, since they are broad and generic. However, amongst the 62 ideas collected we see some recurring trends : the mind-mapping puts a strong focus on gender, inclusion, traditional knowledge, ecosystem services and learning as pertinent means to promote resilience in socio-ecological systems. That is in fact how CEBioS understands SER within its own interventions. In a sense, CEBioS can consider resilience of socio-ecological systems not only as a framework to link biodiversity to the benefits local communities and indigenous people get from ecosystem services (ES), but also as an outcome, effect or impact on these communities. These ES provide additional strong arguments to protect biodiversity beyond their obvious intrinsic value. As a capacity building programme, it is not surprising to see that P5 (learning and associated feedback culture (P3) by means of coaching, mentoring, juries, etc) is seen as a strong resilience promoting agency.

Two broad themes emerged during the verbal part of the brainstorming.

The first was the integration of different cultural ways of looking and knowing in projects around SER, for example art, poetry or magic. Traditional knowledge and cultural traditions can be a valuable way of helping people connect to knowledge about ecosystems and preservation and in return they can help researchers interface with local knowledge. An example of this would be the book Braiding Sweetgrass by Robin Wall Kimmerer, which attempts a reconciliation of traditional Potawatomi ways of viewing nature with botanical science. More broadly, this can relate to the concepts of hot and cold knowledge: hot knowledge is the knowledge that has an emotional impact on people whereas cold knowledge is that which doesn't necessarily have an emotional valence. For example, hot knowledge would be a piece of knowledge that motivates someone to go into conservation, whereas cold knowledge is most of what that person then learns at university to be able to do this job. Hot knowledge is often key to motivating people, and these cultural approaches can be very valuable in turning knowledge hot.

Semi-related to this was the discussion of value chains. It is important, in attempts to further conservation, to not sacralize nature as something completely apart from humanity that must not be touched. This can easily make the matter irrelevant to the average person, making them blind to ecosystem services and lowering SER. Instead it's important to show how these tie into the local economy and society, for example by taking ecosystem services into account when researching value chains. Doing this can also lead to projects attempting to boost SER being more conscious of how to approach local

problems. For example, approaches that worked for sustainability in Europe might work less in Africa, since African economies are much more informally organized and official guidelines will have much less of an effect, so a knowledge of how ecosystem services tie into this will lead to more effective campaigns for boosting SER.

More specifically, the principles P1 (diversity) and P2 (connectivity), as seen by Sterk et al. (2017) relate both to the environment and the people. Given the fact that GTI and MEP promote respectively a better understanding and monitoring of the biodiversity, they are more linked to these two principles. However, P3 to P6 (feedbacks, CAS, learning and participation) are the DNA of the mission and vision of CEBioS. Indeed, capacity building is all about that and we promote a participatory approach based on needs and demands of our partners. A higher ownership of the beneficiaries of CEBioS interventions will create more agency and better agents of change. Moreover, P4 (CAS) and all it is implicating, is the very basis for the agility of the programme. The programme and all its stakeholders are able to rebound and adapt to new situations at strategic and operational levels. That makes its strength and resilience and this percolates to the collaboration, hence creating a more resilient environment of the partners and their beneficiaries like local communities. And finally, P7 (governance) is at the very core of IP and CHM-POL. It shows that the choice of the sub-programmes during the formulation of the actual five-year programme and 10-year strategy of CEBioS is reflecting a Theory of Change (can be consulted in link) tending to a higher resilience of both CEBioS and partnerships.

The fact that CEBioS adhered and actively participated to the joint strategic framework on SER helped to situate CEBioS in a framework of science-policy-development interface. An improved resilience of social-ecological systems can be considered as an overall impact when biodiversity is well managed, sustainably used and duly protected. In that sense, CEBioS considers SER as a powerful empowering framework within its own interventions and a strong justification towards governance, policy and decision-making at Belgian federal levels and at national levels in the partner countries.

A number of interesting questions were raised, which could guide us :

1) How can we align scientific goals with effective capacity building and local needs?

2) How does CEBioS support local networks?

3) How is the knowledge provided in the workshop translated to practise?

4) Does CEBioS track implementation of their recommendations to concrete policy actions?

5) Where is the line between the most suitable and locally sustainable actions?

A recommendation is for CEBioS to be even more alert about this resilience

message within the respective sub-programmes and transversal (e.g. gender, trans-sectionality) interventions and be more explicit in its narrative of outcomes and impacts towards that end.

And finally, DGD recommended: implement what you preach, improve delivery actions on the ground, learn by making it simple in other contexts, winning time, CHM most difficult, maybe not oblige yourself if not possible. Social well-being, what does it mean for us before trying to implement it.

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