Concept Note: Co-designing A Biodiversity Credit Toolkit

The recent meeting of COP15 of the United Nations Convention on Biological Diversity concluded with an agreement to reverse nature loss and restore biodiversity loss by 2030. Many groups party to the agreement considered that biodiversity credits need to play a critical role in this process. There was no widespread agreement on the form of these credits or the markets they are to be traded on, but one particularly standardised definition emerged from the Wallacea Trust, of

- For every 1% increase in species abundance/richness or prevented loss per hectare, one biodiversity credit is generated.

This form of credit appears well-suited to processes of large-scale automated assessment and trading in potentially planetary, liquid marketplaces, but we are a long way from such systems of assessment and marketplaces being built. All the same, their construction is inevitable — already Australia is tabling a Nature Repair Market Bill which will legislate and regulate the operation of these markets.

In the meantime, small-scale and Indigenous populations, especially from the developing world, are at risk of being excluded from such markets without some basis for negotiating the basis and meaning of the credit, and mediating its access to their local markets and cultures. These populations are the most crucial to be included in this process, as set out in a presentation to the 2021 UN Food Systems Summit, Indigenous Peoples are the best stewards of our environment.

This note focuses on projects based around communities which are already centrally of interest to the CIFAR Data Communities for Inclusion project being undertaken in partnership with SEWA, and in particular two cooperatives of self-employed women farmers in rural Gujarat, Megha and Kheda.

These cooperatives hold many members who are engaged in a variety of agricultural practices, and are already finding themselves under pressure from prospective sponsors from the developed world to steer towards monocultural, intensive farming practices based on input of sterile seeds and fertilisers that will be destructive of long-run soil quality and biodiversity. SEWA members retain a memory and practice of more diverse, harmonious cultivation practices — and have commented, anecdotally e.g. that “they would not eat the okra cultivated on their commercial fields since they don’t know what has gone into them”. These communities would be urgent priorities to be recipients of resources through a biodiversity credit scheme, which would enhance and amplify their traditional practices whilst allowing them to gain a livelihood. However, there is great work to be done in listening to the voices of these communities and building cultures and markets that are supportive rather than destructive of their native agriculture.

This note outlines two, mutually supporting but somewhat distinct, scopes of activity in the next two sections:

1. Bridging to Biodiversity Markets

In the first scope, the existing practices of SEWA farmers are bridged to a straightforward notion of biodiversity credit as defined above. There are many impediments to this — firstly, the scale of operation of the farmers is typically well below the 1 hectare unit of the credit. As per the baseline survey (conducted by IT for Change and SEWA, unpublished), over 80% of farmers own land smaller than one hectare.

Regen Network, a pioneering and successful broker of carbon credits through improved land stewardship, has several projects available on their Regen Market, but these are all multiple hectares in size.

Paromita Sen, research manager of SEWA Bharat, has written eloquently on the Last Mile Model, explaining how, especially during the pandemic, access was bridged between large scale markets and individual workers and their families by special cooperative members named *aagewans* (“those who step forward”) in numerous areas, including access to financial, medical and governmental services, and it seems certain that these special members will also be essential as part of any activity bridging local farming practices to biodiversity markets.

But beyond the simple issue of scale, in terms of bridging to a standardised biodiversity credit, there are numerous other acts of interpretation to be performed. It seems very likely that indigenous practices of cultivation will be natural promoters of biodiversity, soil health, and healthy nutrition, but this will require to be justified.

Vandana Shiva, in Ecofeminism (1993) has written (p.81)

> For example, *bathua* is an important green leafy vegetable with very high nutritive value which grows in association with wheat, and when women weed the wheat field they not only contribute to the productivity of wheat but also harvest a rich nutritional source for their families. With the intensive use of chemical fertilizer, however, *bathua* becomes a major competitor of wheat and has been declared a 'weed' to be eliminated by herbicides. Thus, the food cycle is broken; women are deprived of work; children are deprived of a free source of nutrition.

and also (p.169)

> Biodiversity is also essential to maintain the sustainability of self-provisioning farm units, where producers are also consumers. HYV [high yield varieties] monocultures mean that more farmers will become consumers of purchased seed, thereby creating dependency, increasing production costs and decreasing food entitlements at the local level.

> Finally, purchased seeds displace women from decisionmaking and custodianship of seeds and transform them into unskilled labour. Main **cereal crop associates** [our emphasis] are called *akadi* in Karnataka and women make all decisions relating to the *akadi* crop. In the words of a Lambani woman, 'What do (men) know about the *akadi*, they only know how to *besaya* (plough).' Due to women's involvement in the *akadi* crop traditional seeds are preserved over generations. One woman said, 'they are the seeds grown by me, and my mother in my native family, and it is the seeds grown by the daughter'.

Note that the term "cereal crop associates" appears to have been coined by Shiva and appears nowhere else. The fact that natural cultivation practices accommodate partially accidental, but generally encouraged associate crops, suggests that they will naturally be encouraging of floristic and biodiversity of other kinds, but bridging to a wider scale market will require some mustering of evidence for this.

Satellite imagery, for example that made available through the popular European Sentinel-2 programme, could be a route to mustering this. An exciting recently published paper, Double down on remote sensing for biodiversity estimation: a biological mindset (Rocchini et al, 2022) presents an algorithmic modelling framework for estimating biodiversity information from such a dataset, and some of the authors have published an open source library, biodivMapR, for performing this modelling. However, such techniques have strong limitations, especially for our communities of interest. They are unable to perform good estimates in highly variable terrain, as well as over small, scattered diverse areas of land, and cannot assess biodiversity of an understorey. Most of all, they are dependent on a high quality baseline biodiversity assessment performed on the ground by qualified experts of a representative area of the terrain.

In terms of standard, Western, practices of biodiversity assessment, India, and in particular Gujarat seems thinly represented. There appears to be a thinly populated market of biodiversity consultants, and as representative benchmarks, the Flora of Gujarat is a printed resource produced on a cadence of 30-40 years, compared to comparable resources issued digitally in the West typically every decade. In terms of citizen science, Gujarat is represented by 46,000 observations on the popular iNaturalist platform, which compared for example to the UK represents a factor of 60 thinner density of observations per square kilometre. The nearest regional centre of the Botanical Survey of India is nearly 500km away, in Jodhpur. Building local capacity in this area could be a hugely helpful outcome of this project, as for example recommended by "Embedding Equity in Nascent Nature Credit Markets" from Nature Finance:

> "It is imperative that conservation and restoration or rewilding programs, as well as monitoring, reporting and verification of outcomes be locally co-designed and co-produced, since evidence shows that conservation works best when local communities lead it. In fact, IPLCs [indigenous populations and local communities] can become paid "citizen scientists", gaining additional income, rather than getting displaced by external researchers, data providers and analysts."

but focusing on purely Western and numerical measures of biodiversity would be a strategic mistake as we discuss in the next section.

2. Negotiating the Meaning of Markets

The meaning of the “standard biodiversity credit” is extremely limited in scope, simply to the impact on the ground in terms of biodiversity, numerically considered. Renegotiating and widening the space and meaning of a credit is the second scope of activity of the project. For the credit to have meaning in the scope of SEWA’s culture, it needs to be referred to the full space of cultural activities surrounding the cultivation, not least the role of food, different foodstuffs in and their preparation, and the roles of these in promoting health amongst the members and their families, as well as cultural and historical meanings. For example, What we ate then and what we eat now: a grandmother's tale (Seshadri et al, 2018) comments that the diversity of diet in Indian communities has declined hugely within the lifetimes of those questioned in the study.

> “The variety of vegetables consumed has come down significantly – ten types of green vegetables now as compared to 20 before, for example; and there has been a shift in the types of vegetables being consumed. Earlier, the choice was largely traditional, locally grown produce, such as gourds, roots and tubers. But now, the preference is for what are termed ‘English Vegetables’ such as cauliflower, cabbage and tomatoes. These are more expensive and not part of the traditional diet. The choice of fruit has been severely curtailed, with various types of berries and wild fruit being discarded, and the preference mainly for fruit that find their way to the market like apples and bananas.”

A recent BBC article, responding to the UN’s announcement of 2023 as the “International Year of Millets”, explains the huge local value of millets across India in promoting food security and dietary health, and empowering local farmers and promoting biodiversity. It should be possible for these multifarious benefits of Indigenous flora and their cultivation and patterns of use to be nominated and invested in as part of a “credit”, together with venues for sharing and promoting local recipes and treatments of the grains, as part of the Indigenous culture’s natural activities.

This connects with current initiatives under the heading of Ecocultural mapping, for example underway at the Floe project’s work in the Salish Sea surrounding Vancouver Island, in particular the Xetthecum region of Galiano Island. The Ecocultural Mapping Project, in pilot status, aims to meaningfully braid together Indigenous ways of knowing and Western ecological science in its region of interest, fostering open access to science, scholarship, technology and art.

Rather than intruding on the culture with foreign ontologies and patterns of measurement, the project will respect and support these natural activities, allowing many details to be kept private to the culture as necessary, whilst amplifying and promoting those aspects that the culture is happy to share and export. The negotiation and articulation of these boundaries will be pursued as a co-design process undertaken with and led by the culture itself. This co-design process

would become an evolution and specialisation of the existing Community-Led Co-design Kit already under development by the IDRC and its deployment within DCI.

[TODO - research notion suggested by Revathi of a “food ontology”]
[TODO - add some material here about AI governance]

The difficulties of this process should not be underestimated — since many aspects of it are inherently self-contradictory. As recorded in the principles of Ecofeminism, Western economic and knowledge modes have evolved to only assign value to that material which can be extracted across a boundary — ignoring those processes which operate more efficiently by keeping material as close as possible to its site of generation during its lifetime. As such, these modes systematically neglect value created by Indigenous peoples, women, and the natural world — weaving together these radically different modes of value so that these neglected values can be honoured, preserved and supported, in the end, by global capital flows, will involve difficult and unprecedented kinds of work. But we have no alternative but to seize this task, since the global flows of technology-mediated capital and knowledge are not going away — they will only intensify, and unchecked and unmediated, they will inevitably destroy the ecosystems of life and culture that we hold most dear.

As Ruskin wrote in “Unto this Last”, an important influence on Gandhi, “***There is no wealth but life***”, and we must set about ensuring that it is so.

Questions for SEWA members to bootstrap enquiry

1. What crops do you grow for your own family’s use that you would never consider selling, perhaps because they have no commercial value or are unfamiliar outside your community?
2. Do some of these crops help each other when grown close together (multi-cropping)?
3. Do you harvest some of your own seeds, and know that the varieties of crops you grow from them are different to those on the market, or even different to your neighbours’?
4. How did you learn about these crops, and in what patterns they like to be grown, and who will you pass this knowledge on to?
5. What special recipes do you know that involve these crops, or perhaps stories or legends in which they feature?

If relevant:
6. How does the land on which you grow crops for your own family/community look different to the land on which you grow commercial crops?
7. Who has expressed an interest in these seeds/crops?

This note has been distilled from the working group notes at
Biodiversity for SEWA Working Group Notes