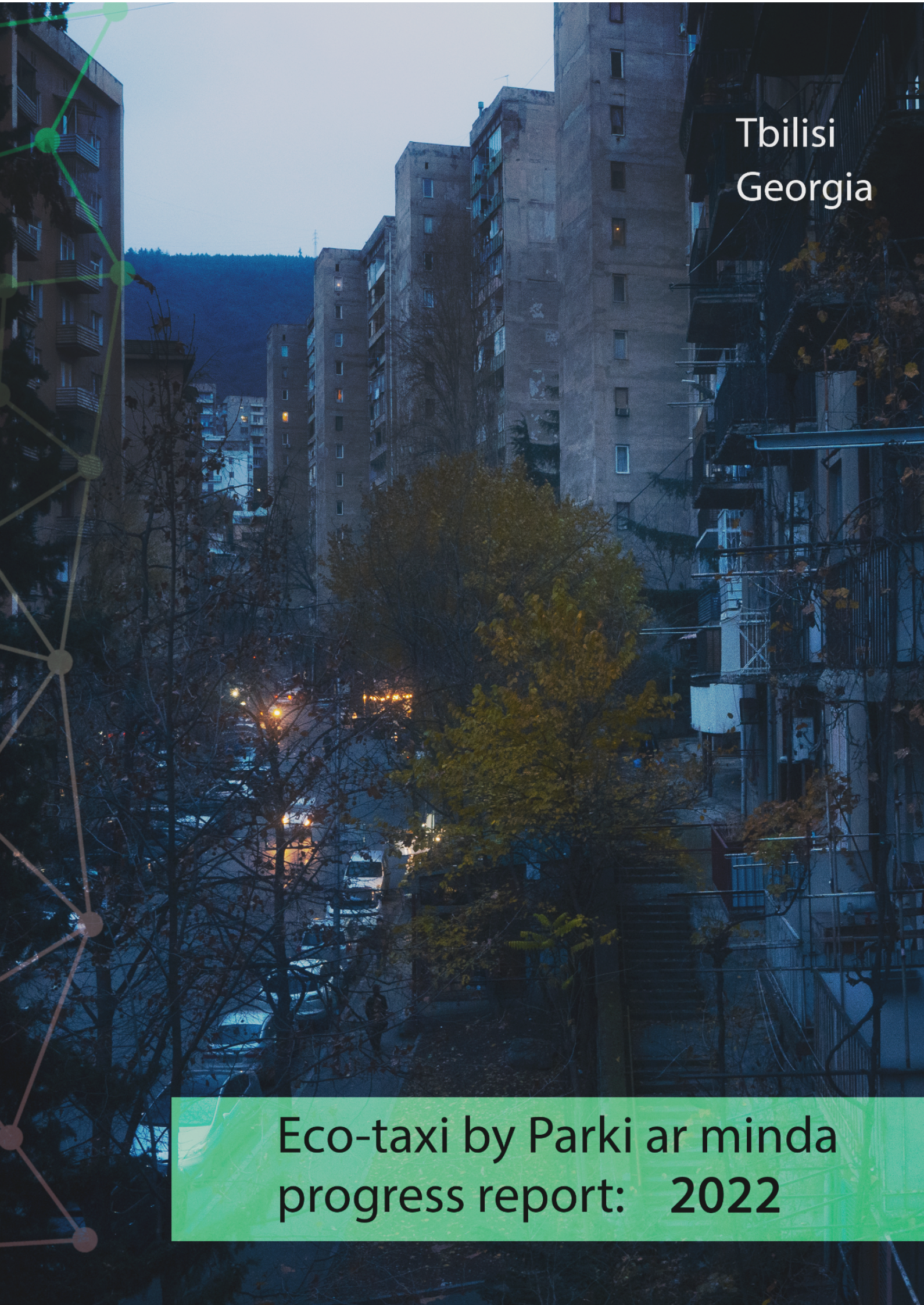

Eco-taxi by Parki ar minda progress report: 2022

Report on the 2022 community waste collection in Tbilisi, Georgia,
by Parki Ar Minda

Sustainable cities and communities.
Responsible consumption and production.

These are two of the seventeen UN Sustainable Development Goals inspiring our work. This report showcases a sustainable solution for the community waste management service and eco-educational work. Background and methodology of the project revealed, impact described in quantitative and qualitative terms. Bottom-up approach discussed in context of the capacity building, fundraising and rapid scaling challenges.

Motives

While our project aims to tackle the bigger problem of waste pollution and ineffective waste management system in the country, we act locally and focus on people first. Our collection services started as a response to the demand of Tbilisi residents for separate waste collection during pandemic when then existing collection points were closed for quarantine. We believe that communities and individuals can impact their environment and drive structural change for the better.

We support the bottom-up demand for change through adoption of new practices.

Effective waste management system starts at the source, meaning our homes, and serves all, meaning the users themselves. We trust in people's ability to engage actively in what meets their needs, and will share some impressive evidence below.

Focus on people also helps us to develop behavioral insights related to social norms, important traits in Georgian society. Through our collection activities and eco-educational we show that recycling is possible and not very hard. Thanks to extreme transparency of operations and tailored communications we create trust among our audience. It triggers the “word of mouth” which we think is the major factor for wide and quick distribution of environmental improvements.

Building for the civil society we still value the commercial framework, as it provides financial motivation along with independence and self-sustainability. These are requirements vital for an initiative to survive the environmentally challenging conditions.

Method

Locality and decentralization appears essential for the green civic ecosystems at scale[1]. Similar case is generally observed in the natural ecosystems where the local autonomy of a species provides fine tuning to the adaptive and therefore highly specialized *behavior* models, in course of the *evolution*[2]. Same analogy is widely applied in *computer science*[3], which substantiates the intelligent algorithms as increasingly complex systems utilizing the multiplicity and diversity of the separate *computational entities* (*"*nodes" or "neurons")[4]. Many findings reveal applications of the distributed "biological" patterns in the engineering industry, e.g. for controlling *the power grids*[5], but also promising aspects of *undirected novelty search* for the human's creativity[6], as contrasted to the standardization and general planning[7]. Additional insight to the need of locality-first educational and economical prerequisites for many environmental projects in human context can be revealed quoting from the SDGs website (see in appendix)*. In this report some of our own evidence will be discussed in regard to the model.

When envisioning the organizational structure for the project we rely on the following properties:

Self-sustainability
The organization must make a living from its work, by being paid by the local community.

Network based
The organization must rely on horizontal and direct connections in communicating within the community and in global context.

Transparency
Impact related results and routines must be evidently accessible for the community with priority for the local members. And reported openly for other institutions and

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[1] Effective climate change adaptation means supporting community autonomy (2022)
[2] Evolutionary Epistemology, Rationality, and the Sociology of Knowledge (1989)
[3] Design Patterns from Biology for Distributed Computing (2006), A Design Pattern for Decentralised Decision Making(2015)
[4] Evolving Neural Networks Through Augmenting Topologies (2002)
[5] Robust Decentralized Secondary Frequency Control in Power Systems: Merits and Trade-Offs; NREL/JA-5D00-71122 (2020)
[6] Novelty Wins, "Straight Toward Objective" Loses! or Book Review: Why Greatness Cannot Be Planned: The Myth of the Objective, by Kenneth O. Stanley and Joel Lehman
[7] https://www.researchgate.net/profile/Ian-Christoplos

organizations in the field up to the global scale. Operational and administrative decisions must be communicated openly to all parties involved.

Scalable by design
The organization must be reproducible administratively as a “node” capable of reproducing an impact on a new location.

Feedback and community reinforcement
Organization must take care for educational component of communicating it’s values and objectives, make sure to provide plausible learning conditions for community members, utilize natural feedback and reinforcement in raising environmental awareness efficiently within the community,

The report

We successfully demonstrated **400%** growth through the year 2022, based on experience gathered in the previous years, our community support, and the increasing bottom-up public initiative for the green change.

For the past 3 years we successfully showcase the independent community driven self-sustainable waste management service in Tbilisi. We targeted at educating the general public on the best practices available locally for the optimal packaging-trase reduction in Tbilisi.

We implemented a highly customized educational workflow, side by side with the practical ways of *reduction, reuse and recycling* for the multiple waste types. We searched and investigated the region, so we could partner with the reliable recyclers and available collection points, and include them on the recycling map for everyone. We collect the widest range of waste types in Tbilisi. It is not only commercially valued **PET bottles** and **cardboard**, but also **glass**, **tin**, **other plastics**, **bottle caps**, **toothbrushes** and more[8]. We built up from the ground an economic model capable of covering all the logistics and majority of the associated expenses, while providing commercial services along with the district collection points aka “garages” available for free to the general public and operated by volunteers.

In the late 2022 we started testing the web3 responsible data solution from buckitup.net[9] for human supervised machine learning. The locally hosted AI will be trained on users’ labeled data for the capability to recognize the waste composition. It will provide much easier onboarding and highly customisable guidelines to new customers. Automation

[8] The complete list can be found on our website: eco-taxi.ge
[9] What I recycle the mobile App to improve scalability

breakthroughs may reduce drastically cognitive friction to waste management education and further increase adoption rates of separate waste management in Tbilisi.
As you can see further, while lacking the traditional scaling opportunities based on strong workflow standardization and sufficient operational revenues, we have triggered the exponential growth of the enterprise driven particularly by the network effect, that is exactly the increase in **people**, sincerely motivated and contributing for their community well being and the global change.

The following figures show quantitatively our progress over the past year.
During the 2022: Eco-Taxi service and total amount of collected waste grew **4 times** in comparison to the 2021.
The number of visitors to our Garage in Vake grew **10 times** since the start of the year resulting in the opening of a second Garage in Saburtalo in late November.

We did **105 rides** covering **1526 addresses**. More than **4000 people** visited our collection points. All in all during 2022 we collected around **70 tons** of waste compared to only **16 during** previous year. Among them: **10 tons of PET plastic**. This waste type showed the biggest growth in volumes - **5 times** more than in 2021. **7,5 tons of paper waste** went for recycling, **1 ton of aluminum and 1 ton of tin**.
We also collected a lot of electronic waste and batteries.

the progress diagrams

Capacity building.

Our plans for the next year must remain ambitious in order to prove conceptually the survival potential of the civil projects driven by the environmental general impact goals. We are eager to challenge the widespread scaling dilemma which we call the “subjectivity filter”. Many bottom-up emerging projects rely exclusively on subjective decision making, dependent solely on particular individuals, usually project founders, where everybody else is basically helping them out. Further growth traditionally requires centrality and depends on significant incentives or high generated revenue. Both cases require uniform operational policies, making it largely inconsistent with varying environmental conditions* and civil agendas. Civil projects are rarely found to be scaling massively[10] or heterogeneously like fashion or cultural trends. We believe, overcoming founders' subjective management limits is crucial for civil action, while a significant part of the excellent projects is being constantly filtered out from global adoption by the incompatibility with standard requirements for the organizational scaling.
On the other hand when approached carefully the organization capacity may be grown significantly while maintaining the diverse structure[11]. Examples are often found in culture: art, science and educational trends. Things speaking to a sense of meaning like technical innovation or fashion related communications tend to spread and adopt rapidly around the globe, with no uniform structure or single policy. The capacity building in our cases has to be raised around the education on environment and community management techniques, which requires external funding.

We seek additional resources to be spent on learning and developing better organization structure, diverse and reliable enough for providing large-scale adoption of waste reduction & management.

We believe in separate waste recycling for the future of densely populated areas, and the power of people to operate responsibly in their own environments. Our project must keep self-sufficient operationally, depending on the local community in local revenues, but for the long term organization objectives external support is required.
We hope for financial sponsorship from traditional businesses to encourage the capacity building in Parki ar minda. Such investment has the most potential to augment the environmental impact generated within the society, and trigger the community driven systematic change[12].
Our financial model for 2023, therefore accounts for a major increase in spendings on people. The ever increasing team of our workers must be rewarded with the market appropriate wages, ensuring the economical and environmental reinforcements to be aligned.

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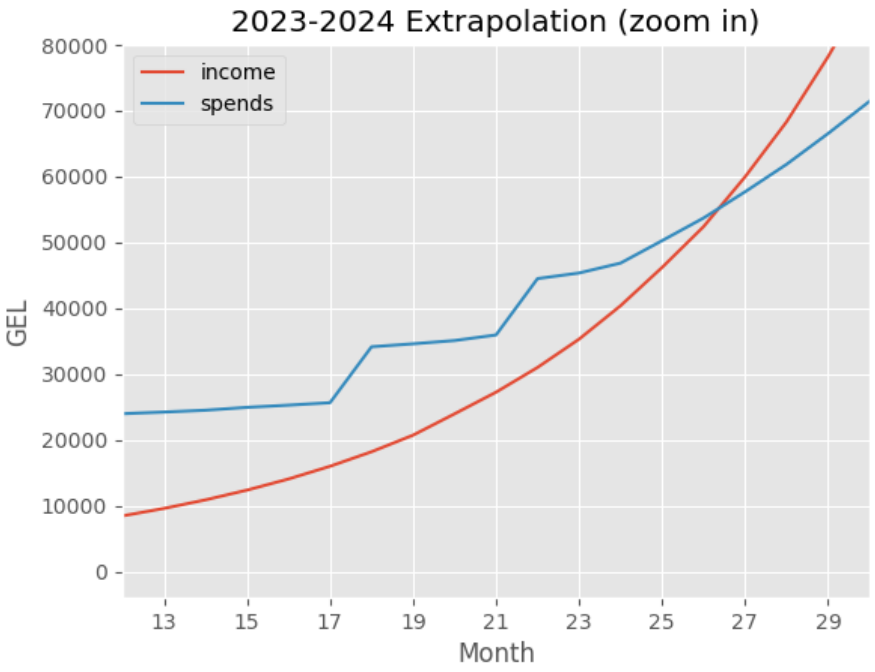
[10] Scaling Out, Scaling Up, Scaling Deep: Strategies of Non-profits in Advancing Systemic Social Innovation (2015)
[11] Scaling the impact of sustainability initiatives: a typology of amplification processes (2020)
[12] Paths to Scaling-up: Alternative Strategies for Local Nongovernmental Organizations (1996)

We predict solid payback sufficiency for the recycling business to be achieved by growing **twice (or higher)** than the existing figures in number of clients including corporate, and the recycling load[13]. Therefore keeping the rate of growth is not only methodologically plausible, but vital for us, and the ecosystem.
To optimize the performance efficiency we will deploy additional vehicles on track, pressing equipment and collection points (garages) during 2023.
Retaining the exponential rate of growth requires innovative thinking and extensive community engagement. By deploying better management processes and extending our team we will engage more in technological innovations, community based education efforts and long term planning. If our capacity building plan succeeds, we will be able to better incorporate our experience, educate other communities globally, share, partner, support and encourage similar initiatives in other parts of the world.



for the full financial data representation see the appendix below

Discussion

Several objections may come when discussing the business model and factors behind the quantitative model outlined in the present document. We will briefly touch on the most obvious concerns that are likely to come up when considering the cultural and sociopolitical context.

1. Recycling profitability and impact in question.
In many cases the public suspects recycling companies to gain significant profits from selling

[13] see the “Extrapolation 2022-2024” plot above

the materials, therefore expecting the companies like our own to be paying to the end customer for separating and delivering the stock. This strategy sounds very intuitive with a great advantage of natural financial incentive for everybody to engage. Our experience confirms major disproofs for the theory:

- Trade in recyclables can currently provide only limited revenue, enough to partially cover the transport and operational expenses but not to the point where the end customer can be paid off. Which nevertheless brings direct value to individuals and communities in terms of environmental and social gains.
- Potential increase in profitability operationally compromises true environmental gains. While only the chosen fractions get hunted for, such management furthermore alienates from dealing with real waste management and targeting the community needs, making it pointless for the communities to engage.
- Recycling is the last resort for the waste management, it must be preceded by general avoiding of the disposables and reuse. Any model that gains revenues from recycling alone will express negative environmental effects thus supporting the production of disposables at the end of the day.

2. War - migration as a factor of growth.
Social conditions that followed the period of 2022 are largely associated with Russian invasion in Ukraine and the subsequent terrible war. This extraordinary and dramatic crisis had multiple global consequences. Among the most direct ones is massive migration both from Ukraine and Russia, of which Georgia got most affected by Russian migration particularly. Since most involved in the separate waste management traditionally is the Russian population of Tbilisi, the high growth rate of our service must have a lot to do with the migration factor. This may be pointed out to say that the growth shown above should not be accounted as a valid predicting phenomenon, since it was largely intensified by the extraordinary conditions. We'd respond to that by pointing out that migration both from social causes along with climate change, sadly is anything unusual for the cities of the modern world. Crises like wars and migration waves unfolded in 2022, despite feeling extremely unexpected and frustrating for most of us involved, unfortunately are not anything new for people, and widely expected to keep happening again. This forecast holds considering the environmental reasons alone[14]. On the optimistic side of this tragic view, we can witness how potent and healing may become the environmental involvement for individuals and communities under pressure. Parki ar minda assists largely to "Tbilisi Cleanups"[15] - civil initiative involving volunteers in cleanup events held regularly in the public areas of Tbilisi and around it. During 2022 we were impressed to see hundreds of volunteers among refugees (Russian and Ukrainian) joined Tbilisi Cleanups. Many volunteers at Parki Ar Minda belong to the same immigration, and we see how involvement serves them as important psychological support. Opportunities in community-minded and impactful action provide priceless connections and meaning for people during the crises. We must admit that projects like our own perform outstandingly in terms of inspiration and utility among groups and communities at risk. Such groups are not going to disappear anywhere soon, but eco-education and action, seems vital for enhancing the healthy and productive social

[14] Guidelines for Integrating Ecosystem-based Adaptation into National Adaptation Plans: Supplement to the UNFCCC NAP Technical Guidelines (2021)
[15] Tbilisi Cleanups in Instagram

integration along with the environmental improvement. It delivers value both for local communities and people moving from place to place.

3. Impact seems irrelevant in comparing to the “western world”
When looking at numbers on the waste management in the rich countries of the “global north” and the results in Georgia for reference, the former show an incompatible advantage. In contrast to many EU countries Georgian recycling results relative to the production of waste remain insignificantly small. It’s easy to think that adding another 70 tons recycled by Parki Ar Minda in 2022 may hardly make any difference. From our perspective, comparing the existing performance is misleading, not only because the starting conditions have nothing in common between the countries. Most importantly the environmental projects must be evaluated according to the life-cycle approach, in context of their requirements and prospective potentials. Current situation in waste management hardly satisfies anybody in the globe, although in many of the western cities, extensively regulated green protocols empowered in the top down fashion give fruitful results that may seem very effective on direct comparasant. Nevertheless their experiences are doubly promising to anybody else. Western success in the city ecology may be technologically but not sociologically transferable to less developed countries, where change in waste management is most required. From our experience it is supported by seeing westerners in Tbilisi having more trouble than average Parki ar minda clients, with learning and comprehending our custom (localized) waste separation requirements. In contrast to municipality provided eco-services, responsible recycling guidelines depend drastically on the local conditions and personal contribution, which can’t be uniformly regulated. The organizational architecture typical of western environmental measures heavily regulated and subsidized are clearly inaccessible for the developing world[16]. In contrast the self-sustainable network based solutions, scalable by design, relying on feedback and community network effects, represent a more promising lifecycle as we tried to show in the present paper.

Conclusion

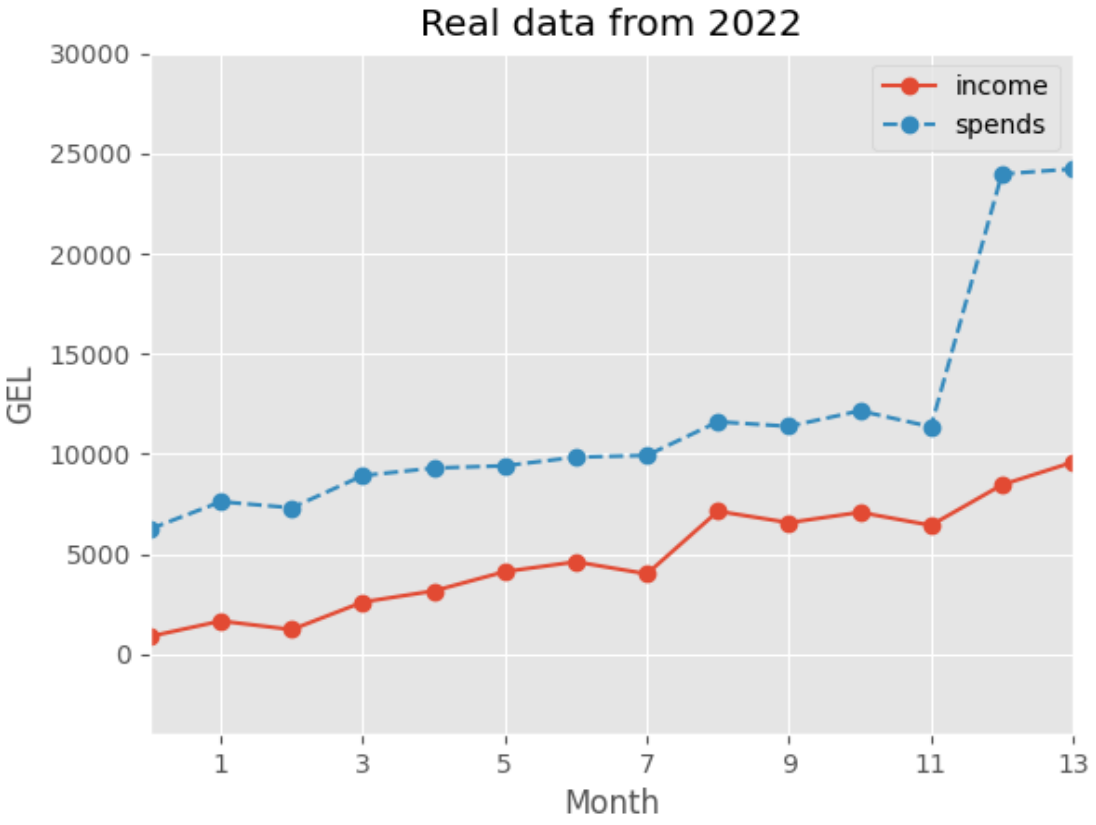
As many inspirational people around the world are trying their path to better environmental practices for sustainability in the city’s life, aligning those attempts to the global goals (SDGs by UN), our project is one of the attempts of such kind. “Parki ar minda” comes combined as an educational and practical project working on raising awareness and providing solutions in the field of waste reduction and responsible waste management for the population of Tbilisi, Georgia. 4 years ago two women, Mariam Pesvianidze and Tatiana Remneva, started a civil campaign for guiding the general public on the abilities of changing the traditional, environmentally unfriendly, waste disposing habits for the advanced responsible practice of waste management, which they customized patiently to suit local conditions. Parki ar minda (“I don’t want plastic bag” in Georgian) the advanced, academically backed, community driven approach for sustainable waste management, has been attracting significant response from many city residents, but also from the local businesses including, naturally,

[16] Scaling up Civil Society: Donor Money, NGOs and the Pastoralist Land Rights Movement in Tanzania (2003)

the industrial recyclers. Project significantly grew into a full scale waste management enterprise capable of providing a continuous cycle of environmentally friendly waste handling for individuals and companies within Tbilisi. On the basis of the full scale separate waste handling workflow the educational part developed even larger! As the waste separation process requires constant enquiry on its details from the customers - broader adoption, and dissemination of the environmental knowledge is natural. The initiative progressively attracts new participants on multiple levels: customers, volunteers, employees and partners, most of which are strongly motivated to practically support the environmental attitude in their society. Our community, environmental and educational impacts are growing interdependently which exposes the promising opportunity for the Parki ar minda and numerous independent initiatives alike to become a game changing trend in the SDGs adoption for urban communities.

Appendix:

Financial data and modeling with future extrapolation:


Real data from 2022
income
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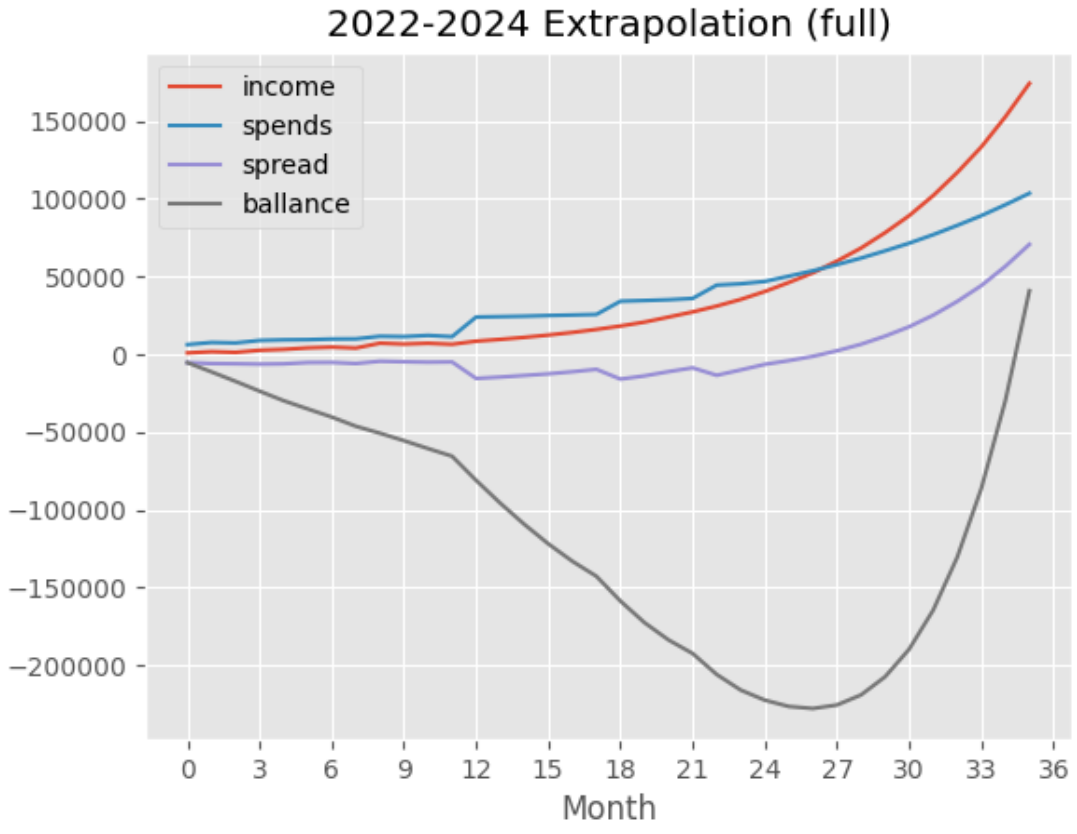
2022-2024 Extrapolation (full)
income
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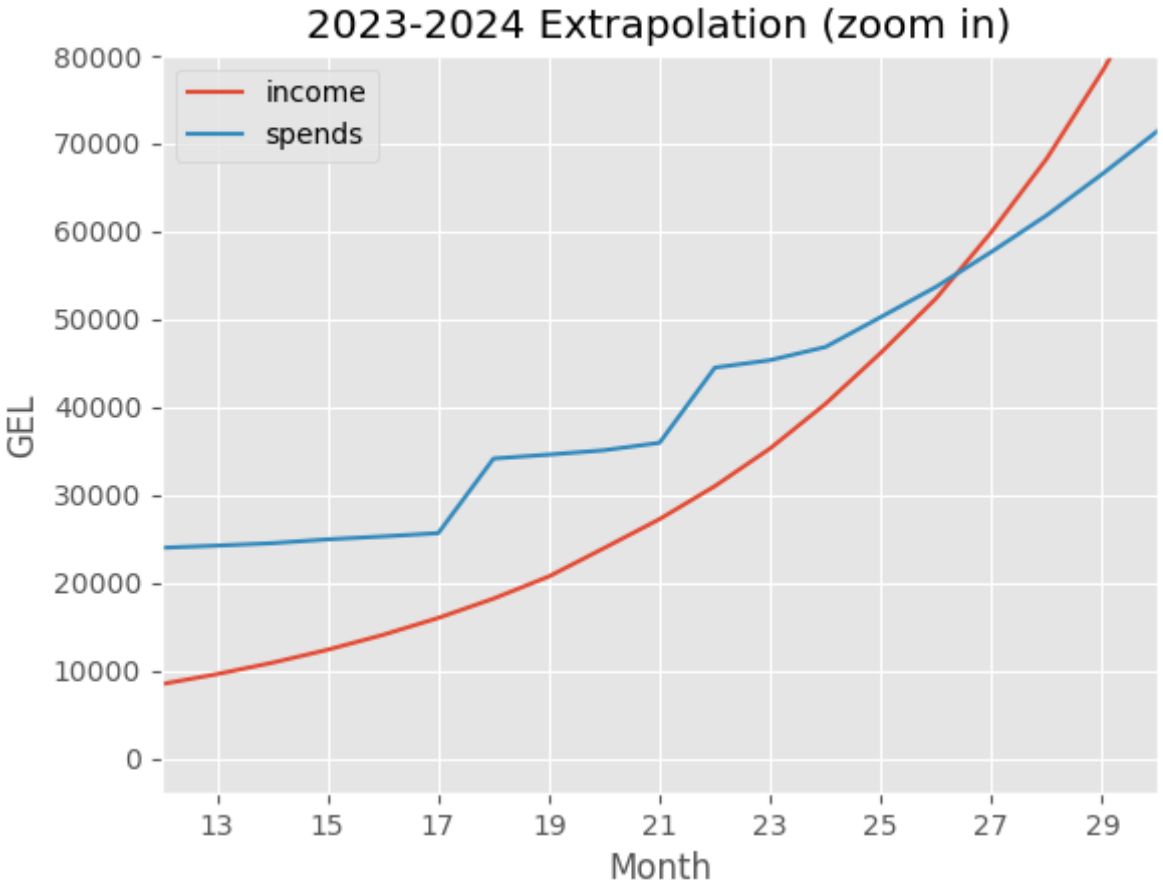

*As being said earlier many of the SEG's, when decomposed, support the perspective of bottom-up prioritization for the environmental initiatives worldwide:

- Equal rights to ownership, basic services, technology and economic resources
- Encourage effective partnerships
- Education for sustainable development and… and appreciation of cultural diversity
- Respect national leadership…
- Knowledge sharing and cooperation for access to science, technology and innovation
- Support job creation and growing enterprises
- Sustainable economic growth
- Promote youth employment, education and training
- Diversify, innovate and upgrade for economic productivity
- Full employment and decent work with equal pay
- Reduce waste generation
- Support developing countries' scientific and technological
- Capacity for sustainable consumption and production
- Understanding of sustainable lifestyles
- Sustainable management and use of natural resources