Promoting Cluster of Green Entrepreneurship in Pokhara

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Is the project a case of…:

☐ State-initiated co-creation

☒ Entrepreneur-driven co-creation

☐ Grassroots-based co-creation*

**For an elaboration of the typology, please consult the GOGREEN theoretical framework p. 25.*

Integrated case analysis

Before proceeding to the scoring of the GFs, please provide a *3–5 page case analysis* in which you describe the background, history, and national, regional, and local contexts of the case, the problems and goals addressed by the local collaboration, the participating actors and their relationships, the unfolding of the co-creation process, the most important governance factors (this may include factors other than those in focus in this project), and the generated outputs and outcomes. The conclusion may specify a few lessons learned from the case study.

1) Background, history, and national, regional, and local contexts of the case

Pokhara is one of Nepal's fastest-growing cities, standing at the crossroads of quick urbanization, rapid population expansion (Gupte & Bogati, 2014), and an escalating solid waste management crisis (Sodari, 2017). The city faces an urgent need to reducing current levels of waste generation while simultaneously increasing the recycling of material and energy resources, which are considered as the essential steps towards an environmental-friendly waste management system. Pokhara Sanitary Landfill has been recently shut down and developing another appropriate site remains a formidable challenge, as it hinges on a multitude of environmental and economic considerations. The presence of numerous lakes, tourist destinations and historical landmarks within Pokhara, it is imperative that the chosen site ensures the preservation and protection of these vital assets (Gahatraj, 2022). Landfill can no longer be the first choice for disposal among the other methods such as recycling, composting, and incineration, but is instead viewed by local waste management experts as a last step after all other possible solid waste management practices.

Another challenge related to waste management is the lack of regular community engagement, training, and awareness programs for waste segregation. Service users are unaware of the potential benefits of waste recovery and recycling. In parallel, the local government lacks oversight, investment, and land for project expansion. Private companies are facing market challenges without subsidies, adequate waste supply, and political support (Moktan, 2023). In general, Nepal lacks the necessary skills or resources to effectively manage the waste (Rai et al., 2019). Although the current legislations have empowered municipalities to conduct all the necessary action to promote a more sustainable waste management

system at the local level, they nonetheless lack the technical and infrastructural resources to tackle the issue of waste management. (Dangi et al., 2017).

The Cluster of Green Entrepreneurship in Pokhara, Nepal, happens in the backdrop of the global trend of adopting sustainable and eco-friendly practices, which has become an imperative for Nepal's sustainable development (Bhattarai & Bhattarai, 2023). A notable trend in the region is the growing interest among Nepalese youth in green entrepreneurship, which may also help address pressing environmental concerns. Various factors such as interruptions in energy supply, heavy reliance on India for fossil fuel imports, and a mounting solid waste issue have catalyzed this shift. These energy supply crises in Nepal have prompted a growing interest in clean energy alternatives among young entrepreneurs in Pokhara. This newfound enthusiasm has extended beyond the energy sector, encompassing areas like waste management, organic farming, and forest-based products. However, waste management facilities are under severe strain, with Pokhara generating over 190 tons of municipal waste daily, 15% of which comprises plastic. This accumulation of plastic waste constitutes a significant portion of the city's municipal solid waste.

In response to challenges such inadequate waste management services and as unemployment, many young entrepreneurs in Pokhara have embarked on green start-ups. Nevertheless, these green enterprises have been operating independently with limited support system and limited collaboration. Recognizing the untapped potential of bringing these enterprises together with a coordinated approach, the Cluster of Green Entrepreneurship was defined as a strategic initiative to unite these independent entities into a unified cohesive network.

The concept of a Cluster of Green Entrepreneurship is an initiative aimed at uniting existing green entrepreneurs in Pokhara and fostering the development of new green startups. The goal is to create a collaborative ecosystem where green businesses can support each other, share resources and knowledge, and collectively address the city's environmental challenges. This cluster represents a strategic effort to harness the potential of green entrepreneurship and accelerate the transition towards sustainable economic practices in Pokhara. The idea to form the cluster was catalyzed by the Governing Green Transitions (GOGREEN) project, which aimed to study co-creation and collaboration as tools for promoting green solutions. While GOGREEN provided the framework for identifying governance factors (GFs) that could enhance collaborative green entrepreneurship, the formation of the cluster came from a practical need identified by the actors themselves. These ventures not only offer innovative solutions to local problems but also serve as a means of promoting entrepreneurship within the city. Their determination and resilience in the face of government negligence regarding waste management have paved the way for these inspiring initiatives.

2) The aims of the project and the sustainability problems that it seeks to address

The Nepalese case study aims to assess and promote a cluster of green enterprises in Pokhara, setting them as examples to empower and inspire young individuals. This cluster serves as a catalyst for the green transition in the region, motivating more youths to develop their green start-ups. Initially, the project included three green start-ups from Pokhara, all of which were founded by local youths who were addressing the city's pressing environmental issues. The key objectives of these projects were twofold. First, they sought to promote green entrepreneurship in Pokhara, Nepal, by creating successful examples

and stories of local green start-ups to inspire other young entrepreneurs. Second, they aimed to foster a sustainable transition by encouraging the local adoption of sustainable economic practices, which in the current case study is exemplified by the start-ups focused on waste management and clean energy.

Intervention of the GOGREEN Project

The GOGREEN project did not directly intervene to create the Cluster of Green Entrepreneurship in Pokhara. Instead, the cluster emerged organically from the independent activities of various green enterprises like Himalayan Life Plastics Recycling Plant, Waste Service, and the Gandaki Urja. These enterprises were already addressing environmental and social challenges in Pokhara, but they were working in isolation from each other. GOGREEN, as an external research project, played more of a reflective and analytical role rather than being a direct catalyst for forming the cluster. Its research framework focused on examining how co-creation in partnerships and networks could promote green transitions. Through its study, GOGREEN highlighted the existing gaps and opportunities for collaboration between these enterprises. The formation of the cluster happened during the course of the GOGREEN study, but it wasn't a direct result of an intervention initiated by GOGREEN itself. The green enterprises realized the need for cooperation to strengthen their efforts in environmental sustainability, waste management, and social entrepreneurship. And during the GOGREEN's survey and interviews shed light on the importance of this collaboration, and became platform to bring them together.

The Pokhara Metropolitan City Office issued a Call for Expression of Interest (EOI) in 2023. In the pursuit of sustainable and efficient waste management within Pokhara Metropolitan Municipality, the Metropolitan decided to establish a waste processing center based on the concept of public private partnership investment. This initiative operates under the framework of the Public-Private Partnership and Investment Act, 2075, and the Public-Private Partnership and Investment Regulations, 2077, specifically under paragraph-3, in accordance with sub-section 2-c of Rule 17. The legally qualified companies are invited to express their interest in participating in the project to Build, Own, Operate, and Transfer of the Waste Processing Center. After the intervention of GOGREEN Project, On May 03, 2023, Himalayan Life Plastics Recycling Plant, Pokhara Central Treatment Facility and Gandaki Urja have collaboratively submitted their application for the project. If selected, they will work together to establish a waste processing center focused on recycling, material and energy recovery from the waste generated from whole Pokhara Metropolitan city office. To this end, the development of cluster and bring them together has played a pivotal role in spotlighting these initiatives and encouraging more young individuals to embark on their journeys towards green entrepreneurship, all while contributing to the broader global goals of sustainable development. This case study examines the interdependent and networked relationship between three successful initiatives in Pokhara (the so-called Cluster of Green Entrepreneurship), each dealing with waste issues through their shared common goals.

The GOGREEN project acted as a catalyst by adding motivation and drawing global attention to the participants' individual efforts, encouraging them to form a cluster of green entrepreneurships. While the enterprises involved—such as Himalayan Life Plastics Recycling Plant, Waste Service, and the biogas plant—were initially operating independently, the project highlighted the potential for collaborative success through a shared research agenda. GOGREEN's interest in examining co-creation processes in green transitions showed these entrepreneurs that by coming together, they could not only strengthen

their operations but also contribute to a global understanding of green entrepreneurship and innovation. This collaborative aspect helped them recognize the value of forming a cluster to collectively achieve higher environmental and social goals. The general startup community was already active, with each enterprise contributing to sustainability in their respective sectors. However, GOGREEN's focus on co-creation, collaboration, and partnership offered a unique opportunity to synergize their efforts. The three actors did not have significant prior joint activities, but the motivation during the case study of GOGREEN project brought them together under a common goal, fostering a more structured collaboration.

3) The participants and their interaction and communication in and between meetings

Core actors (Founders/Owners):

Himalayan Life's overarching mission of empowering marginalized children and youth in the Himalayas. A key activity undertaken by the organization includes the establishment of the Himalayan Life Plastics Recycling Plant. Daniel Burgi, the CEO of Himalayan Life, founded the organization, which has spent more than 20 years saving, caring for, and protecting the region's most vulnerable children. Burgi was driven to make sure that neglected and abandoned children in Nepal and India had access to basic necessities including food, shelter, education, and chances for a better future after seeing the struggles they encountered. Challenges encountered in implementing the Street Kitchen programme, which helps homeless children with detoxification and responsible living, gave rise to the idea for the Himalayan Life Plastics Recycling Plant. They had trouble finding jobs and integrating into society because they had no formal schooling. Acknowledging this, the idea of the recycling plant sought to meet the needs of marginalized youth by offering vocational training and jobs within the factory. However later the operation and management of the plant was entrusted to the youths of Pokhara who reshaped the organization.

Himalayan Life Plastics Recycling Plant is a remarkable endeavor, annually recycling a staggering 40 million plastic bottles. In the process, it creates employment opportunities for 60 dedicated staff members and more than 250 collectors and suppliers. This triple bottom line initiative is a testament to its remarkable success. One of its primary achievements is its significant contribution to poverty alleviation. The collaboration between a dedicated recycling facility and the involvement of scavengers, bottle collectors, and waste collection service providers has led to the substantial accumulation of PET bottles for recycling, offering a lifeline to many in need. Himalayan Life Plastics Recycling Plant is also an environmental steward. By rescuing and recycling millions of plastic bottles annually, it substantially reduces plastic pollution and its harmful impacts on the Himalayan ecosystem. This initiative is not solely about recycling; it’s about making a lasting difference. Profits generated from its operations are reinvested in the protection, nurturing, and education of disadvantaged children in the Himalayas. This responsible investment cycle creates a positive ripple effect, securing a brighter future for the region’s youth.

Waste Service, run by Santosh Poudel in Pokhara, Nepal, is the only private medical waste disposal company in the country that improves medical waste management while addressing the climate crisis. In order to ensure proper disposal, they contact hospitals, gather medical waste, and use high-temperature procedures to ensure sterilization and detoxification. They collaborate with local governments to pursue an effective and long-lasting waste management plan. Following strict waste management requirements, its Central Treatment Facility (CTF) accepts and processes five tonnes of garbage every day from over 150

healthcare facilities. Waste Service exemplifies how Pokhara has established efficient waste management practices since 2018, as it started requiring healthcare institutions to enter into contracts with the CTF.

Waste Service expanded its services to include consulting and waste collection from hospitals and other medical facilities, aligning with Nepal's healthcare waste management guidelines. Following WHO standards, consultants educate on proper waste handling, including segregation and disposal of medical waste. They emphasize reducing waste and safely managing items like syringe needles. The role of Waste Service is crucial in establishing systematic waste management practices, catering to hospitals of all sizes. However, the onset of COVID-19 overwhelmed their capacity, highlighting the urgency of healthcare waste management. However, this crisis also presented an opportunity as Government of Nepal understood better about the importance of proper healthcare waste management. COVID-19 has illustrated the chaos that ensues when medical waste is not managed effectively, emphasizing the critical need for prioritizing healthcare waste management.

Gandaki Urja Pvt. Ltd, a privately-owned company based in Pokhara, Nepal, is pioneering sustainable practices through its substantial biogas plant. Established by a group of promising young individuals in 2019, the company has since made significant strides in the realm of environmental responsibility and economic sustainability. Gandaki Urja Pvt. Ltd operates a sizable 45-ton-per-day Compressed Biogas bottling plant, showcasing a commitment to effective waste management. Central to its operations are the multiple-feed Continuous Stirred Tank Reactor (CSTR) digesters, which ingeniously convert organic materials such as animal dung, manure, and household organic waste into biogas. This plant has the capacity to generate a remarkable 1,600 kg of Bio-Compressed Natural Gas (Bio-CNG) daily, offering a green alternative to Liquefied Petroleum Gas (LPG). The company further enriches the value chain by treating the digestate from digesters to create high-quality organic fertilizers, to the tune of approximately 10 tons per day.

Gandaki Urja encountered challenges in its effort to create a market for its CNG gas and organic fertilizers, particularly due to the dominance of LPG gas and technical. The production of CNG gas proved difficult to compete with the established market for LPG gas. Moreover, the inability to liquefy CNG made it necessary to use large cylinders, posing logistical challenges for household-level services. With hotels and restaurants as their target customers, the COVID-19 pandemic severely impacted their business. Although they shifted focus to selling organic fertilizers, encountering technical hurdles along the way, the company nearly faced bankruptcy in 2023. Without government subsidies and support, sustaining such initiatives remains challenging. Additionally, technical assistance is needed to develop lighter cylinders for household CNG gas delivery.

Secondary actors:
Pokhara Metropolitan City Office: Pokhara Metropolitan City Office (PMC) is responsible for overall waste management of Pokhara and PMC has shown some interest for sustainable waste management initiatives. In order to manage healthcare waste in the city, PMC approved the construction of a Central Treatment Facility (CTF) for Waste Service, giving them land. They also granted approval for the company to collect and manage all the healthcare waste generated from various health facilities in Pokhara. Similar, for

Gandaki Urja, PMC permitted the utilization of organic waste from the Pokhara Wholesale Vegetable Market. However, PMC has not yet finalized any actual agreements with Himalayan Plastic Recycling Plant.

Alternative Energy Promotion Center: Alternate Energy Promotion Center (AEPC) was established to promote the use of renewable and alternative energy technology. Serving as a bridge between the operational level NGOs/private promoters of renewable energy and the policy decision levels in relevant ministries. AEPC is an indispensable partner in fostering cooperation. Furthermore, AEPC has given Gandaki Urja financial assistance and subsidies for the installation of its plant.

Varying suppliers and collectors have also assumed a variable role in the project:

a) For Himalayan Life Plastics Recycling Plant, Scavengers, a bottle collector company have been supporting their services.
b) For Gandaki Urja farmers, they have also had varying suppliers for organic waste materials for processing in the biogas plant. The hospitals, clinics, laboratories, and other healthcare institutions that generate healthcare waste and utilize the services of the treatment facility are other actors of Waste Service.

4) How often do they meet, and do they communicate between meetings?

After the formation of the green entrepreneurship cluster, communication between the members became much more frequent. Previously, these enterprises—Himalayan Life Plastics Recycling Plant, Waste Service, and Gandaki Urja—operated independently with minimal interaction. Now, they meet on a monthly basis and maintain communication between meetings as well, fostering a collaborative atmosphere. They have both formal meetings and informal meetings in regular basis.

5) The role and forms of knowledge sharing, coordination and joint problem-solving

The formation of cluster has been a platform for them especially for of knowledge sharing, coordination and joint problem-solving. The major outcomes after the formation of cluster are as follows:

Collective Problem-Solving: At the initial stage of cluster formation, they discussed on common challenges they all faced in their operations. Over time, this evolved into more strategic conversations about how they could support each other. For example, they brainstorm solutions to operational difficulties, like optimizing recycling processes or expanding into new markets.

Resource Sharing: Sharing resources became a critical part of their interactions. For instance, Waste Service also utilized the facility of Gandaki Urja for the organic waste and also provided the PET bottle collected by them to Himalayan Life Plastics.

Strategic Planning: The cluster also discusses long-term planning, including joint ventures and market strategies. They plan ways to enter and explore common markets, leveraging each other's strengths to access more opportunities.

The most important issue they have realized through the formation of cluster is the gap in the legislation and proper policy for subsidy and support from Government Sector for these green enterprises. The green enterprises have to pay Value Added Tax like normal business and there are no reduced taxes on imports of machinery. And these are the policy changes they combinedly want to address from the government.

6) The relation between consensus and conflict and the handling of the latter

Conflicts between the owners within the green entrepreneurship cluster have primarily revolved around future planning and investments. The size and scale of enterprises varies and larger enterprise with substantial investments have different priorities compared to smaller startups that operate with fewer resources. Another area of conflict has been over governmental policies. Waste Service is seeking full government subsidies to support their initiatives; however Himalayan Life Plastics rely on external funding. However, Gandaki Urja often prefer less government interference, fearing that excessive regulation led to inefficiencies. Despite some disagreements, the cluster has focused on finding middle-ground solutions through discussion and reasoning.

7) The role and form of leadership: lead actor, steering group and/or collective leadership

The leadership within the cluster of green entrepreneurs is built on a collaborative model where different companies contribute their unique strengths. For instance, Himalayan Life Plastic excel in marketing, another Gandaki Urja in research and development (R&D), and Waste Service in networking and partnership. This creates a dynamic where leadership is shared based on expertise, with the more successful enterprises guiding others in their respective areas. This form of leadership helps foster collective problem-solving and strategic planning, as they can pool their expertise to address various challenges. The collaborative leadership style also encourages mutual support, which is vital for maintaining cohesion in a group of enterprises with varying capacities and investment levels.

In addition to sharing expertise in marketing, R&D, and finance, some of the owners have access to political leaders. This added layer of leadership, through political connections has been somewhat beneficial, further enhancing the collaborative model helping to reduce conflicts regarding local issues. as it allows the cluster to address policy-related conflicts and strategically advocate for favorable conditions that benefit all members. The sharing of leadership qualities across marketing, R&D, finance, and political influence ensures that no enterprise is left behind, and the cluster as a whole can progress toward shared goals.

8) The temporal unfolding of the co-creation process: major shifts and ups and downs

The emergence of green entrepreneurship among Nepalese youth reflects a growing trend towards sustainable development and environmental responsibility. However, the financial sustainability of these enterprises has been the major challenge. These are all recent enterprises and has been just less than decade of establishment and they all had to go through various unprecedented challenges such as COVID, economy crisis etc.

Phase I: Establishment and Initial Challenges (Pre-COVID Era)

All three enterprises faced significant challenges in establishing their businesses. Himalayan Life Plastics Recycling Plant was set up to recycle PET bottles, provide employment for marginalized youth, and contribute to environmental conservation. Waste Service and Gandaki Urja similarly began operations with a strong green focus, but each encountered difficulties in securing supply chains, managing government policies, and operating in a limited market where there was low awareness of green products and solutions. Government policies were not well-defined for green businesses, so they had to operate under the same frameworks as other businesses. They had to have to pay Value Added Tax like normal

business and there is no subsidy on imports of machinery even they contribute in green economy. The market for green products was limited due to a lack of awareness about sustainable solutions.

Phase II: COVID Era (2020-2021)
COVID-19 brought a mixed impact across the enterprises.
Waste Service: COVID-19 highlighted the critical importance of managing medical waste, and Waste Service played a crucial role in addressing the crisis. The company's Central Treatment Facility expanded its capacity and importance as it handled daily medical waste during the pandemic, becoming an essential service for over 150 healthcare institutions.
Himalayan Life Plastics Recycling Plant & Gandaki Urja: Both companies faced severe disruptions due to supply chain issues and decreased demand. Supply shortages and low demand severely affected their operations, leading to financial stress and operational challenges during this period.

Phase III: Post-COVID Recovery and Strategic Exploration (2021-Present)
Reinvention and Global Standards: In 2018, Himalayan Life Plastics Recycling Plant made substantial investments to align with global recycling standards. By refining its granule purification processes, the company aimed to meet international benchmarks and reimagined its operational strategies. They optimized sourcing channels to ensure a consistent supply of raw materials and increased efficiency in operations.
Formation of Green Cluster (Post-2021): During this phase, the idea of forming a Green Entrepreneurship Cluster emerged, especially after the realization that collaboration could lead to more robust operations and shared market benefits. The GOGREEN Project motivated the enterprises to work together, knowing that there was global interest in their projects and they could achieve higher goals through collective action.
Increased Communication and Collective Strategy: Monthly meetings began, focusing on resource sharing, common market strategies, and problem-solving. Each enterprise brought its own strengths: marketing expertise, R&D innovation, and access to finance, including connections to political leaders.

9) The most important governance factors (may include factors other than those in focus in this project)
N/A

10) The generated outputs and outcomes
Green Entrepreneurship Cluster in Pokhara has been achieving notable environmental benefits.
Himalayan Life Plastics annually recycles 40 million plastic bottles, processes over 1,200 tons of plastic waste annually and offsets over 4,000 tons of CO2 emissions through plastic waste recycling Gandaki Urja (Biogas Plant) processes 45 tons of organic waste daily, and produces 1,600 kg of compressed natural gas (CNG) daily and generates 11,000 kg of organic fertilizer per day, promoting renewable energy source and sustainable agricultural practices. Through the CNG gas production Gandaki Urja can offset approximately 1,770 tons of CO2 emissions per year. Also, the Waste Service processes five tons of medical waste daily from over 150 healthcare facilities, ensuring safe disposal and reducing environmental hazard.

Resource Sharing and Collective Problem-Solving: Prior to the cluster's formation, the enterprises rarely interacted. Now, they are together working on common challenges, sharing resources, and exploring

market opportunities. The cluster fostered resource sharing between enterprises. For instance, Waste Service has been using the space and resources of Gandaki Urja and providing resources for Himalayan Life Plastic.

Create Green Jobs: More than 100 staffs are engaging in these enterprises and as these enterprises fosters more jobs will be created. The formation of cluster is to encourage and facilitate other green enterprises from the lesson learned from the cluster. The cluster has encouraged and facilitated green entrepreneurship among Nepalese youth, showing how green businesses can succeed.

Intervention in green policies: Some members of the cluster had access to political leaders, which facilitated smoother navigation of government policies and potential financial support, giving the cluster an edge in decision-making and resource acquisition. Also because of their effort government will soon work on facilitating their efforts especially in subsidizing certain components of their business.

11) Lessons learned about the conditions for co-creating green solutions

The recent closure of the Pokhara Landfill site has exposed the inefficiency of traditional waste management methods, where the government solely handles the responsibility. This challenge underscores the need for a more collaborative approach, bringing together public and private actors—government agencies, private companies, NGOs, and local communities. Each of these stakeholders shares a common goal but is motivated by different interests. By aligning their efforts, they can co-create green solutions that are more innovative and effective than isolated efforts. The involvement of private enterprises offers entrepreneurial ingenuity and expertise in areas like organic waste processing and PET bottle recycling, while government bodies provide the necessary regulatory frameworks. This multi-stakeholder collaboration not only addresses the pressing issue of waste management but also conserves resources for the government and creates economic opportunities for businesses in the green sector.

Partnerships between diverse actors are key to developing sustainable waste management models, especially in a context of Pokhara where finding alternative landfill sites is becoming increasingly difficult. By working together, these stakeholders can create a system that optimizes resources and benefits everyone involved. Furthermore, the co-creation of green solutions is not only an immediate necessity but also the way forward for future waste management efforts. The green cluster in Pokhara serves as an example of how shared leadership, where each actor contributes based on their strengths can tackle complex environmental challenges. This collaborative model offers a blueprint for addressing growing waste management issues while promoting economic development and environmental stewardship.

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Scoring and analysis of governance factors

1. Perceived importance of biosphere conditions

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☐ 0.66	☒ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

All the informants mention environmental problems as a key reason for establishing the initiatives like Gandaki Urja, Waste Services and Himalayan Life Plastics Recycling Plant. These initiatives are of crucial importance for biosphere by **minimizing resources use and recycling the resources, conserving resources, reducing pollution, and over all well-being**. Through practices such as recycling plastic, managing medical waste, and producing clean energy from organic waste, these projects **address environmental challenges** and contribute to a **more sustainable future.** Himalayan Life Plastics annually recycles 40 million plastic bottles, processes over 1,200 tons of plastic waste annually and offsets over 4,000 tons of CO2 emissions through plastic waste recycling. Gandaki Urja (Biogas Plant) processes 45 tons of organic waste daily, and produces 1,600 kg of compressed natural gas (CNG) daily and generates 11,000 kg of organic fertilizer per day, promoting renewable energy source and sustainable agricultural practices. Through the CNG gas production Gandaki Urja can offset approximately 1,770 tons of CO2 emissions per year. Also, the Waste Service processes five tons of medical waste daily from over 150 healthcare facilities, ensuring safe disposal and reducing environmental hazard. More than 100 staffs are engaging in these enterprises and as these enterprises fosters more jobs will be created. The major driver for these cluster was to **solve environmental problems** and **create job opportunities** from waste. By recognizing the interconnectedness

between human activities and the environment, they emphasize the need for adopting sustainable practices to create economic opportunity and ensure the vitality of ecosystems and communities.

2. Legislation, programs, and formal goals

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Several informants refers that these initiatives are driven by SDG goals such as affordable and clean energy, climate action, decent work, and economic growth. These goals also resonate with Nepal's long-term vision of Prosperous Nepal which also include sustainable production and productivity. Many policies seek to promote the role of stakeholders in environment management by their meaning full participations and aiming to enhance their capacity. However, it is acknowledged that many policies in Nepal suffer from governance issues and have fallen short in effectively addressing environmental challenges. Regarding the waste management **Solid Waste Management (SWM) Act 2011,** "the responsibility to manage or cause to manage solid waste shall rest with the local body and the responsibility for processing and management of hazardous waste, medical waste, chemical waste or industrial waste under the prescribed standards shall rest with the person or institution that has generated the waste."

For example, at local level the Solid Waste Management Act has provisions for collection of waste to safer disposal, and the duties/implications for private sector and individuals. However, the Private sectors and individuals have faced several challenges and bureaucratic hurdles to operate their enterprises. Unfortunately, even at the local government level, there are not enough efficient procedures to facilitate the operation. Some of the respondents claim that there are subsidy mechanisms to facilitate the green entrepreneurs but they often remain inaccessible and out of reach for those without connections or influence.

The legislation that governs such initiatives are:

a) Solid Waste Management Act-2011
b) Solid Waste Management Rules-2013
c) National Health Care Waste Management Standards and Operating Procedures- 2020
d) Health Care Waste Management Guideline 2014
e) Renewable Energy Subsidy Policy-2013
f) Industrial Enterprises Act, 2020

The policies and guidelines present some guidelines and opportunities in paper but executing it is very difficult due to bureaucratic hurdles, inconsistency and inefficiencies in the rule. Also, in Nepal the waste management has been subjected to municipality government and it is very unclear when it is handled by

private sector. These initiatives are operating not because of support from government but because initiatives are promoting environmental sustainability and are contributing to economic development and creating job opportunities in Nepal.

3. Relative openness of public governance paradigms

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☐ Medium confidence	☐ Documents
☐ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Even though the initiatives like the Gandaki Urja Himalayan Life Plastics Recycling Plant and Waste Service are highly regarded by both the local and national governments but they only received limited support. While these initiatives have been recognized for their valuable services, governmental support has been minimal, often extending no further than verbal acknowledgment. Despite the severity of waste management issue in Pokhara however the PMC office have failed to adopt inclusive and participatory governance models in their planning process. Even for formulating new waste management plan and strategies in Pokhara they are not consulting with these initiatives for any decision-making processes or they take input from relevant stakeholders. The regulations and policies claim that collaboration between public and private entities is mandatory to address pressing environmental issues however in practice it is rarely observed. There are always bureaucratic hurdles plying with the inconsistency in the policies and guidelines. There has been no effort put by government to bring public and private entities together for both in planning and execution of waste management. When private sector approach them they are usually not interested and this could be due to lack of proper understanding on how these green enterprises function. These initiatives could have been greatly benefited from partnerships with government agencies, NGOs, local communities, and other stakeholders to implement effective waste management and sustainable solutions.

4. Formalized institutional channels for citizen participation and community mobilization

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☐ Medium confidence	☒ Documents
☐ 0.66	☒ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Pokhara Metropolitan City Office is the governing institution for planning and execution of any waste management related initiatives, yet the institutional channels are still evolving and face significant challenges. There are mechanisms for citizen participation and community mobilization but their

execution varies widely. Government bodies have established the structure such as advisory committees, community forums and public hearings to involve the community and citizens in decision making, however they are mostly driven by political interest. Mostly the members involved in these committees and forums are appointed based on personal preferences and most of the time they are not relevant to waste management or they hardly have knowledge in the sector.

Political agendas, bureaucratic hurdles and limited resources has been creating barriers for the participation of relevant stakeholders. Firstly, the involvement of non-relevant stakeholders lacks technical knowhow and political appointment prioritize short-term political gains or personal benefits over long-term solutions. Secondly, bureaucrats slow down the process where the decision could have been made swiftly but with unclear process, unnecessary paperwork and various layer of approval process has discouraged the entrepreneurs.

The initiatives have the involvement of the local citizens and independently with the involvement of NGOs, private organization and local communities they conduct various activities such as participatory workshops, community awareness programs, stakeholder meetings. But there lacks active involvement of the governing institution. Overall, there is recognition of the importance of citizen participation and community mobilization in governance processes, there is still a need for strengthening institutional frameworks and ensuring meaningful engagement of all stakeholders.

5. Mechanism for ensuring top-down government and bottom-up social accountability

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☒ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The initiatives interested in Green Enterprises felt that the decisions made by national as well as local government are not mostly made in prioritizing public interest particularly in case of waste management, the resources are mismanaged and misallocated.

The cluster of green entrepreneurships has developed as a bottom-up approach with collaboration driven by shared goals and challenges. Gradually they have developed into collective action by sharing knowledge and resources and ultimately targeting sustainability.

This has now been the collective approach involving the youths and communities. Also, the grassroot level are being benefited as collectors and suppliers and have played a vital role in driving these enterprises forward. These initiatives have been trying to reach out to the government to hold government institutions accountable and also want to demonstrate their capability in terms of waste management in Pokhara.

6. Strategic agenda-setting by means of translation

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☐ Interviews
☐ 0.33	☐ Medium confidence	☐ Documents
☒ 0.66	☐ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Several informants refers that these initiatives are driven by SDG goals such **as Affordable and clean energy, Climate action, Decent work and economic growth**. These goals also resonate with Nepal's long-term vision of **Prosperous Nepal** which also include sustainable production and productivity.

Government to nationalize the SDG targets, implement the SDGs, mobilize resources, and monitor the progress towards achieving the SDGs by 2030. For example, the partnership has already led to formulation of the **Sustainable Development Goals, Status and Roadmap: 2016-2030** and paved the way for development of **"National Integrated Financing Framework".**

While all the 17 SDGs and 169 targets are legitimate development objectives seen through a global lens, a resource-strapped country like Nepal needs to prioritize, localize and motivate a bottom-up path towards greater progress. Nepal needs a home-grown roadmap that is consistent with the SDGs, and promotion of **Green Entrepreneurship** can be an important milestone. The cluster has prioritized the goal mostly emphasizing climate action and sustainable economic. The contextualizing these goals is based on the contribution it can give in Pokhara's specific need.

7. Construction of narratives about successful multi-actor collaboration

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

For the formation of Cluster of Green Enterprises, different actors such as private enterprises, NGOs, local communities, and individuals, and in some extent government bodies has come together to address environmental challenges and promote sustainable practices. Previously they were working independently whereas now whole purpose of this case is to showcase the constructing narratives about successful multi-actor collaboration and inspire young individuals, provide opportunity and challenges to develop their own green start-ups.

8. Building or harnessing institutional platforms and arenas

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☒ Medium confidence	☒ Documents
☐ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Before the concept of developing the cluster, there was no platforms which can provide spaces for dialogue, problem-solving and knowledge exchange between the stakeholders in Pokhara working on waste management. They were working as s separate entity. Some supports were provided from different sector, but it was not long term solution. The formation of cluster help them come together and provided a platform of co-developing.

One interesting thing that is happening is The Pokhara Metropolitan City and Korea International Cooperation Agency (KOICA) on September 2023 have signed a mutual cooperation project on job creation through Recycle Upcycle (RU) enterprises. The project is aimed at green job creation through recycling and upcycling in Pokhara Metropolitan City. The project is expected to create RU enterprises and create green jobs in the city of Pokhara. From the project, capacity enhancement of the officials of the Metropolitan City, government stakeholders and RU enterprises would be carried out and create green employment. Likewise, Green Venture Zone (GVZ) would be established, and business equation assistance would be extended to the new RU enterprises. If the project is successfully launched, it will provide better opportunity for the Green Entrepreneurs and the Cluster of green enterprises will grow.

9. Provision of access to blended financing

QCA score:	Scoring confidence:	Data sources:
☒ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☒ Documents
☐ 0.66	☐ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

In case of Waste Service there has been some support for Local government (PMC) and local organizations (Hospitals, clinics, NGOs and INGOs) and Development agencies like GIZ, UNDP, FHI, WHO. However, these supports are negligible compared to the operation cost of the enterprises.

From Himalayan Plastic Recycling Plant, the finance was never a problem because it was supported by the foundation from Canada called Himalayan Life.

For Gandaki Urja, AEPC has given some financial assistance and subsidies for the installation of its plant.

Especially in case of Waste Service and Gandaki Urja blended financing would be very important to diversify their funding sources and reduce financial risks. They need to increase their resilience to market enabling them to achieve their economic as well as environmental and economic objectives.

The cluster hasn't received any funding and so far it has been operated by the enterprises.

10. The capacity to leverage support from authorities to enable local collaboration

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

PMC office is the authorized governmental bodies for the waste management in Pokhara. They provided land and also approved the construction of a Central Treatment Facility (CTF) for Waste Service. They also granted approval for the company to collect and manage all the healthcare waste generated from various health facilities in Pokhara. Similar, for Gandaki Urja, PMC office permitted the utilization of organic waste from the Pokhara Wholesale Vegetable Market which generate around 2 tons of organic waste but has not been utilized by Gandaki Urja due to technical difficulties. PMC office has not yet finalized any actual agreements with Himalayan Plastic Recycling Plant but still the PET bottles collected in Pokhara reaches Himalayan Plastic Recycling Plant through various channels.

It seems like local authorities were initially inclined to offer support at the development stages of the initiatives but later there were no follow-up interests. Maintaining continuous effort in building relationships with local government authorities and demonstrating the value of collaborative endeavors in addressing environmental challenges becomes very crucial. Through the cluster formation, they are jointly discussing with the authorized body and it seems like the voice of cluster has been more effective as it raises the common issues and it will be easier for PMC office to solve it.

11. Inclusion and empowerment of relevant and affected actors

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Himalayan Plastic Recycling Plant empowering homeless and marginalized children and as well as youth. They are providing provides vocational training and job to those youths in the factory to lead a sustainable life.

Waste Service in its Central Treatment Facility (CTF) accepts and processes five tons of healthcare waste every day from over 150 healthcare facilities. These facilities used to dispose of such waste in rivers, which posed serious threats to the environment and public health. But since the CTF was introduced, proper waste management techniques have been put in place, reducing pollution to the environment and preserving public health. Additionally, Waste Service's inclusive strategy includes giving marginalized women job opportunities. These women are vital in processing and treating healthcare waste, which empowers them on an economic and social level.

Gandaki Urja has been utilizing agricultural waste from the local farmers and produce biogas and organic fertilizers. This initiative has offered alternatives to traditional waste management of cow dung and poultry waste which not only addresses sanitation issues but also provides financial benefits to farmers.

So collectively they have been working and providing job opportunities for socially deprived women, marginalized children and local farmers.

12. Clarification of interdependence vis-à-vis common problem and joint vision

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☐ 0.66	☒ High confidence	☐ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

These initiatives are implemented in a setting where socioeconomic inequality, poor waste management, and environmental deterioration are major problems. But instead of seeing these issues in isolation, the stakeholders involved acknowledge how interrelated they are and collaborate to achieve a shared goal of sustainability and community well-being.

For instance, Himalayan Life Plastics Recycling Plant is aware of the fundamental connections between environmental conservation and sustainable development and the empowerment of marginalized children and youth. The initiative addresses social and environmental challenges concurrently by uplifting marginalized groups and promoting waste reduction and resource conservation through vocational training and employment opportunities.

Similarly, Waste Service acknowledges the connection between public health and proper healthcare waste management. The programme reduces the risk of disease transmission and environmental damage by ensuring the proper disposal of hazardous medical waste through its Central Treatment Facility (CTF).

Gandaki Urja exemplifies interdependence with various stakeholders by leveraging agricultural waste to produce biogas. It addresses multiple challenges such as energy supply, waste management, and livelihoods. By harnessing organic waste to generate renewable energy, the initiative not only reduces environmental issues but also improves the resilience of the local communities to energy crisis and economic instability.

They all have come to the common terms for collective growth, shared leadership and resources. Working collaboratively, they have been supporting each other fighting various hurdle such as political, bureaucratic, limitation in resources etc together.

13. Trust-building and conflict mediation

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Initially before the formation of cluster there were conflicts of these enterprises with local people, public authorities as all these were related to waste management. Especially the locals were taking it like they are dumping the waste in their backyard. When Gandaki Urja sought to establish its plant, the local residents expressed their concern regarding potential risks and opposed of establishing the plant in that locality. Similarly, there was opposition from local authorities such as PCM office were not happy for the establishment of the plant as it was not within the scope of the PMC office waste management strategy. Waste Service has also encountered conflicts with small healthcare facilities over the waste disposal charges as they generate waste in little quantities, which was easier to dump nearby.

Additionally Himalayan Plastic recycling plant had some issues with the collectors who preferred sending plastic waste to India, disrupting the project's supply chain, and creating conflicts over resource allocation.

Gradually these issues were solved, these initiatives engaged in dialogue and mediation processes to build trust and resolve disagreements. Once the cluster was developed, it was much easier for open communication and addressing stakeholders' concerns.

Also, there were some conflicts between the green enterprises of the cluster as the size and scale of enterprises varies with in the cluster. Also, they had different concern regarding the government policy and subsidy. As concern of Waste Service was to get full government subsidy for the equipment, they

purchase whereas Gandaki Urja and Himalayan Life Plastic wanted to subsidize their product. Despite some disagreements, the cluster has focused on finding middle-ground solutions, conflicts were mitigated, and collaborative solutions were identified.

14. Use of experimental tools for innovation

QCA score:	Scoring confidence:	Data sources:
☒ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☐ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The concept of a Cluster of Green Entrepreneurship is an initiative aimed at uniting existing green entrepreneurs in Pokhara and fostering the development of new green startups. So far it has just been collective tool to raise their voice and platform to share their issues. As it progress it will create a collaborative ecosystem where green businesses can support each other, share resources and knowledge, and collectively. But so far in context of experimental tools, there hasn't been any development.

15. Ongoing critical self-reflection and learning (i.e., process and/or developmental evaluation):

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☐ Medium confidence	☐ Documents
☐ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

For Himalayan Life Plastic demonstrated the significant evolution in 2018 with a proactive approach to staying ahead in a competitive industry. The company was total in loss but recognizing the need to meet global recycling standards, the company invested substantially in refining its processes, enhancing quality, and optimizing operational management. These steps helped them to get reorganization in global market and they were able to expand their sales in international markets as well.

Similarly, Waste Service expanded its services by providing consulting services to health care facilities outside Pokhara region, aligning with Nepal's guidelines and WHO standards. However, after COVID-19, the crisis served as a learning opportunity, as need to address health care waste was severe. The company reassess its readiness to handle such challenges and was more focused on the continuous improvement in healthcare waste management practices.

Gandaki Urja has been encountering many challenges in establishing its market and creating opportunities. The company faced setbacks due to technical difficulties, market dominance, logistical challenges, and

mostly due to COVID-19. However, these challenges led the company reevaluate its strategies and explore possible alternative solutions, such as shifting focus more to organic fertilizers. This process of learning and adaptation hasn't been able to develop sustainable model for them but help them recover from further losses.

With these changes in these enterprises, the cluster itself is evolving. Through the cluster they are not only looking into individual problems but collectively how they can improve. There seem some positive signs waits ahead, as many youths are still trying to follow their footsteps and also upcoming projects Recycle Upcycle (RU) enterprises which can support these enterprises to contribute more effectively to their respective goals.

16. Exercise of facilitative leadership:

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☐ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The leadership within the cluster of green entrepreneurs is built on a collaborative model where different companies contribute their unique strengths. Himalayan Life Plastic was established under the leadership exhibited by Daniel Burgi, the CEO, with the mission of empowering marginalized children and youth in the Pokhara. It was the youths of Pokhara with marketing skills that transform the company into profit making company and build international recognition. Waste Service was established by Santosh Poudel who has been working in waste management sector for a decade and is always in verge expanding his services. He established Waste Service to address healthcare waste management challenges in Pokhara. However, the challenges are similar in other part of Nepal as well so he has been expanding the services. Gandaki Urja has been led by Kushal Gurung and his friends and despite facing various challenges such as technical difficulties, market dominance and logistical hurdles, the leadership has demonstrated resilience and adaptability by investing their own time and resources. This facilitative leadership creates a dynamic where leadership is shared based on expertise, with the more successful enterprises guiding others in their respective areas. This form of leadership helps foster collective problem-solving and strategic planning, as they can pool their expertise to address various challenges. The collaborative leadership style also encourages mutual support, which is vital for maintaining cohesion in a group of enterprises with varying capacities and investment levels.

Outcome variable: Successfully co-created green transitions

The outcome variable 'co-created green transitions' will be scored in two parts. First, 'co-creation' will be scored based on an assessment of whether the participants in the initiative, project or process engaged in collaborative problem-solving that fostered creative ideas and innovative solutions (data will consist of survey data combined with interviews and documents). Next, 'green transitions' will be scored based on an assessment of whether the initiative, project or process has fulfilled or is expected to fulfill its green goals, ambitions and aspirations (data will consist of survey data combined with interviews and internal and/or external evaluation reports, including scientific publications).

The scoring of this variable is done in two parts:

1. *Is the developed solution based on collaborative problem-solving spurring creativity and innovative solutions?*
2. *Does the developed solution engender a green transition?*

This scoring should be conducted based on both the survey and complementary green outcome evaluations. Please consult Sections 4.4 and 6.10 in the Research Protocol for more details.

1. Is the developed solution co-created?

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Survey
☐ 0.33	☐ Medium confidence	☒ Interviews
☒ 0.66	☒ High confidence	☒ Documents
☐ 1		☒ Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring.

A total of 18 respondent responded to the survey. All of the respondents either agreed or strongly agreed that the developed solution mobilized different experiences, and/or ideas and/or forms of knowledge to develop new perspectives. All the responded have agreed that the collaborative problem-solving process mobilized different experiences, and/or ideas and/or forms of knowledge to search for solutions that is unconventional and go beyond regular solutions. It was observed that the co-created solution has address the green transition breaking established practices.

For Instant, Himalayan Life Plastics the first PET bottle recycling company in Nepal and was established not just to address environmental issues but also to create employment opportunities to the youths. Waste Service is first company in Nepal which provide common treatment facility not just for one hospital but manages the heath care waste of the all the health facilities in the city. Gandaki Urja is only company which sells CNG gas commercially in Nepal. The product and services of all the companies in the cluster are innovative in the local context.

However, the lagging part is overall collaborative process of the project where multi-actor has collaborated but the support from government sector is nominal or negligible.

If possible, please insert your survey responses in the table below (in % for each response), including the mean/average % for each survey item.

	Strong. dis.	Dis.	Slight. dis.	Neither agr/dis	Slight. agree	Agree	Strong. agree	Mean
1. Problem-solving mobilized different experiences, and/or ideas and/or forms of knowledge to develop new perspectives						55,56%	44,44%	2,44
2. Through the collaborative problem-solving process, different experiences and/or ideas and/or forms of knowledge have been mobilized to search for unconventional solutions						61,11%	38,89%	2,38
3. The collaborative problem-solving process mobilized different experiences, and/or ideas and/or forms of knowledge to search for solutions that go beyond standard/text-book solutions						44,44%	55,56%	2,55
4. The co-created solution breaks with established practices						38,89%	61,11%	2,61
5. The co-created solution disrupts conventional wisdom					16,67%	44,44%	38,89%	2,22
6. The co-created solution offers new ideas to address the green transition problem						33,33%	66,67%	2,66
7. I'm supportive of the co-created solution						27,78%	72,22%	2,72

8. I'm content with the overall collaborative process of the project	11,11%	33,33%	16,67%	11,11%	16,67%	11,11%		-0,44
9. I feel the multi-actor collaboration process was a prerequisite for the success of the project				22,22%	22,22%	33,33%	22,22%	1,55
10. I'm satisfied by the results of the co-creation effort in terms of expected impact on the welfare of the community					11,11%	44,44%	44,44%	2,33
11. The collaborative interaction in the project has led to an innovative solution						44,44%	55,56%	2,55
12. The actors involved in the project are engaged in collaborative interaction that stimulated creative problem-solving		11,11%	22,22%	22,22%	33,33%	5,56%	5,56%	0,16
13. The co-created solution meets the proposed goals of the project				16,67%	27,78%	33,33%	22,22%	1,61
14. The co-created solution will be durable and robust in the long run					38,89%	22,22%	38,89%	2
15. The co-created solution is expected to significantly improve sustainability for the whole community					27,78%	27,78%	44,44%	2,16

2. Does the developed solution engender a green transition[1]?

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Survey
☐ 0.33	☐ Medium confidence	☒ Interviews
☒ 0.66	☒ High confidence	☒ Documents
☐ 1		☒ Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring:

Himalayan Life Plastics annually recycles 40 million plastic bottles, processes over 1,200 tons of plastic waste annually and offsets over 4,000 tons of CO2 emissions through plastic waste recycling. Gandaki Urja (Biogas Plant) processes 45 tons of organic waste daily, and produces 1,600 kg of compressed natural gas (CNG) daily and generates 11,000 kg of organic fertilizer per day, promoting renewable energy source and sustainable agricultural practices. Through the CNG gas production Gandaki Urja can offset approximately 1,770 tons of CO2 emissions per year. Also, the Waste Service processes five tons of medical waste daily from over 150 healthcare facilities, ensuring safe disposal and reducing environmental hazard. More than 100 staffs are engaging in these enterprises and as these enterprises fosters more jobs will be created. The formation of cluster has provided substantial added value. The Himalayan Life bottles have now secured supply of waste bottles. Waste services have developed their small component within the premises of Gandaki Urja. They are addressing technical issues together along with environmental conditions in Pokhara, thus creating a meaningful green transition.

If possible, please insert your survey responses in the table below (in % for each response). (N=18)

1. The project:	Yes	No	Don't know
…did not produce any green transition solution	0.00	94.44	5.56
…is expected to produce/has produced a green transition solution aiming to avoid a worsening in the status quo	55.56	22.22	22.22
…is expected to produce/has produced a green transition solution aiming to maintain the status quo	44.44	33.33	11.11
…is expected to produce/has produced a green transition solution aiming to improve the status quo	50.00	33.33	16.67

[1] By "green transitions", we mean objectives and aspirations that correspond to at least one of the Green SDGs (SDG 6, 7, 11, 12, 13, 14, 15). The project does not have to refer explicitly to the green SDGs, but the project's green objectives

Please list all the informants you have interviewed for the case study (list project role + interview date):

PMC Office Environmental Officer
PMC Office Sanitation Officer
Operation Manager, Gandaki Urja
Operation Manager, Himalayan Plastic Recycling Plant
Operation Manager, Waste Service
CEO, Gandaki Urja
Chief Program Officer, Himalayan Plastic Recycling Plant
Managing Director, Waste Service
Two representatives from hospitals
Two farmers
Two bottle collectors
Female worker at Himalayan Plastic Recycling Plant
Female worker at Waste Service
CNG gas user
Local residing around the biogas plant.
The survey was done on October to November, 2023. The field observation such as factory visit as well as meeting with the executive and some discussion sessions were done in this period.

Please list all the observations you have made (type of meeting/workshop/etc. + observation date):

On September 13, 2023, all three initiatives participated in INNOFEST 23 organized by PCM Office, KOICA and UNDP in Pokhara. We observed the exhibitions where all three of them displayed their product and services. The INNOFEST was organized to promote green creation and circular economy.
Apart from that, regular factory visit was done to observe the operation of the factories.

Please list all the documents you have analyzed (document name + source + year):

a) Solid Waste Management Act-2011, Government of Nepal
b) Solid Waste Management Rules-2013, Government of Nepal
c) Nepal's Sustainable Development Goals Status and Roadmap: 2016-2030 (2017) Published by National Planning Commission, Government of Nepal
d) National Health Care Waste Management Standards and Operating Procedures- 2020, Government of Nepal
e) Health Care Waste Management Guideline 2014, Government of Nepal
f) Renewable Energy Subsidy Policy-2013, Government of Nepal
g) City-level Assessment and Draft Service Improvement Plan for Solid Waste Management For Pokhara Metropolitan City, World Bank Group, 2020
h) No Time to Waste-Transforming healthcare waste management for a healthier, more sustainable Nepal, GIZ, 2020
i) Promotion of Large Biogas in Nepal: Renewable Energy Confederation of Nepal (RECON), Alternative Energy Promotion Center, 2020
j) https://www.wasteservices.com.np/
k) https://himalayanlife.com/projects/himalayan-life-plastics/

Please note the response rate for the survey/measurement of outcome variable:

We contacted 20 people for the interview. 2 of them later refused to give interview so total 18 respondents were taken into account. Also, it was very difficult to have detail interview with PMC Officers.