Darwin Initiative Innovation Annual Report

Darwin Initiative Project Information

Project reference	DARVN017
Project title	Testing experimental development economic programmes to protect Virunga's biodiversity
Country/ies	DRC
Lead Partner	Chancellor, Masters and Scholars of the University of Oxford
Project partner(s)	Virunga Foundation
Darwin Initiative grant value	197,598 GBP
Start/end dates of project	01-Apr-2023 – 30-Sep-2025
Reporting period (e.g. Apr 2023 – Mar 2024) and number (e.g. Annual Report 1, 2, 3)	Apr 2024-March 2025; Annual Report 2
Project Leader name	Stefan Dercon
Project website/blog/social media	https://www.csae.ox.ac.uk/from-farms-to-jobs-job-creation-to-preserve-natural-ecosystems-in-eastern-drc
Report author(s) and date	Sébastien Desbureaux, Richard Nikiema and Ashley Pople (30 April 2025)

1. Project summary

Farming is the leading cause of natural habitat and biodiversity loss in Sub-Saharan Africa (SSA). [1] As economies in the region undergo structural changes, new job opportunities that are less land-intensive could potentially draw farmers out of agriculture. This shift could decrease pressure on natural habitats, protect biodiversity, and alleviate poverty. Our project brings together conservation professionals and development economists to test how improving access to off-farm jobs can support farmers living around the Virunga National Park (VNP) in eastern Democratic Republic of the Congo (RDC) through a randomised control trial (RCT).

The VNP is the oldest and among the most biodiverse protected areas in SSA. It celebrated its 100th birthday on April 21st 2025. The VNP has an exceptional diversity of landscapes, ranging from the glaciers of the Ruwenzori to grassy savannahs, rainforests, montane forests, dry forests and a numerous aquatic habitats (high altitude marshes, lakes, swamps, rivers, hot springs), as well as the lava of two active volcanoes (Nyiragongo and Nyamulagira). It is home to over 700 species of birds (more than in all of continental Europe) and 218 species of mammals (a record in SSA as well). Many of these species are endemic to the region. They include *Gorilla beringei beringei*, *Chrysochloris stuhlmani* and *Lophuromys medicaudatus*, all endemic to a small sector of the Albertine Rift. Species such as *Pelomys hopkinsi*, which is very probably present in the park, are extremely rare and endemic to the papyrus swamps of the region. *Malacomys verschureni* is only known from five specimens worldwide.

Primates, with 21 species, are an important conservation target. They include species typical of the Congo Basin, such as the Dent's mona monkey *Cercopithecus (mona) denti*, more

[1] Vijay, V., & Armsworth, P. R. (2021). Pervasive cropland in protected areas highlight trade-offs between conservation and food security. *Proceedings of the National Academy of Sciences*, 118(4), e2010121118.
Meng, Z., Dong, J., Ellis, E. C., Metternicht, G., Qin, Y., Song, X. P., ... & Xiao, X. (2023). Post-2020 biodiversity framework challenged by cropland expansion in protected areas. *Nature Sustainability*, 6(7), 758-768.

widespread savannah species and, above all, a group of species endemic or almost endemic to the Albertine Rift, such as the golden monkey *Cercopithecus (mitis) kandti*. VNP is also the only protected area in the world to have three Great Ape taxa: the mountain gorilla *Gorilla beringei beringei*, the eastern lowland gorilla *Gorilla beringei graueri* and the eastern chimpanzee *Pan troglodytes schweinfurthi*.[2]

Over 5 million people are estimated to live directly around the VNP. Farming is the primary livelihood for up to 94% of most neighbouring communities, according to a large census our team organized in 2021. Over 10% of the VNP is illegally encroached with farming. According to the same preparatory work, we note that many young farmers in the region aspire to have careers outside of farming, in sectors with a smaller land footprint than agriculture. Consequently, farming is an activity by default for many people, rather than by choice.

Our partner, the Virunga Foundation, has invested over $100 million since 2015 to promote non-agricultural business development and job creation around the VNP. Over 1600 microenterprises are now connected to VNP's grid, offering around 10,000 direct jobs to neighbouring communities. However, barriers like limited job experience, lack of connections, and migration costs have prevented many farmers from accessing these opportunities. In addition, it is unclear from the economic theory what would be the impact of a reduction in the number of farmers on the demand for lands, particularly in Sub-Saharan Africa, where farming activities are dominated by family farming. As an illustration: if a farm loses one worker, it may decrease the total farmed area due to missing manpower. Alternatively, the farm could opt to switch towards less labour-demanding activities but retain a high demand for land to keep production constant.

The objective of this project is:

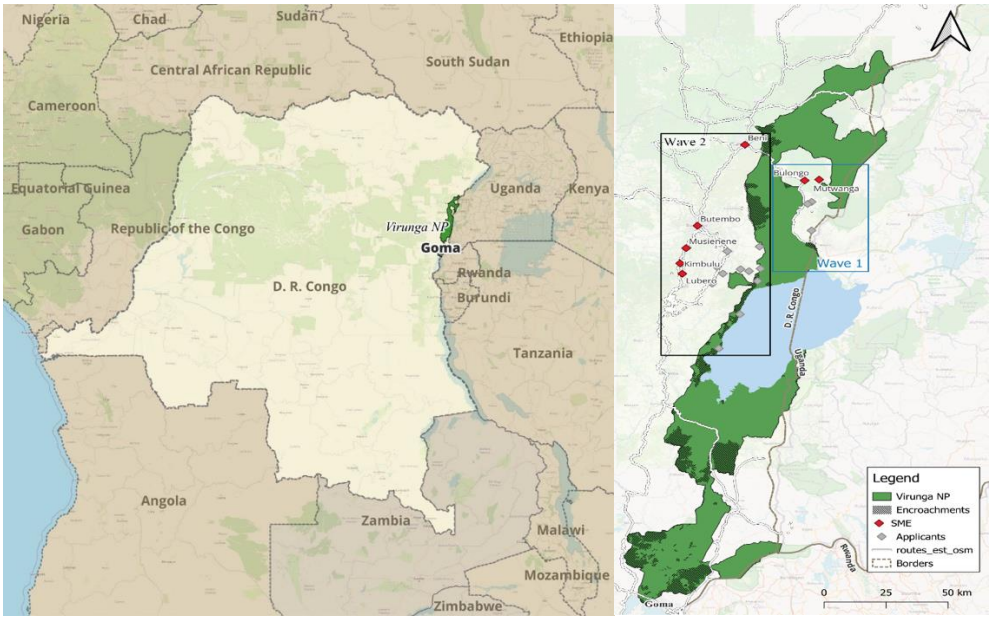
1. To test experimentally interventions that make job markets more inclusive and improve access to off-farm jobs for farmers most negatively affected by conservation efforts around the VNP;
2. To test if such strategy can lead to improve job market outcomes for these people; and
3. To study the effect of this structural change on the demand for lands.

In late 2021 and early 2022, we conducted a large-scale pilot of two job market interventions with 360 participants living around the VNP. Building on this pilot, we designed an RCT. Specifically, we ask whether we can persistently draw young farmers out of agriculture in areas in North Kivu where agricultural activity conflicts with biodiversity conservation led by the VNP and study the possible implications for land use. In the RCT, we test whether offering young farmers a subsidised three-month internship in microenterprises in nearby cities can induce them to migrate and take up non-agricultural work. We compare the effects of this policy incentive to a short-term daily work scheme, which does not require farmers to move away from their villages. A third group of farmers receive nothing in the study. We also cross-randomise a short environmental education session across all three arms. We measure whether these incentives increase non-agricultural employment and reduce demand for agricultural land, thereby protecting natural habitats and biodiversity.

While the project was scheduled to end in April 2025, we submitted a change request to the Darwin team to request an extension. The reason for the change request was the rapid deterioration of the security situation in Goma in January and February 2025, thereby undermining our plan to commence our last endline survey in February 2025. Our project implementation zone was not directly affected by this upsurge of violence, but nevertheless it created a high degree of uncertainty. Moreover, even though the project is located further north, one of our team members and our data collection partner, Marakuja Absl, are based in Goma. It was therefore difficult to launch data collection straight away. The Darwin team accepted this change request. Since then, we have succeeded to launch data collection in March, which we are wrapping up while completing this report.

Figure 1: Map of study location

[2] Languy, M., & de MERODE, E. (2006). Virunga. Survie du premier parc d'Afrique. Lannoo



2. Project stakeholders/partners

The project involves teams from the University of Oxford, INRAE (the French National institute for Research on Agriculture, the Environment and Food) and the VNP.

The collaboration stemmed from a demand from the park in 2018. The VNP approached Prof. Stefan Dercon to lead an academic sounding board that aimed at bringing academic expertise, mostly in social sciences, to guide the projects from the park. Following two meetings in 2018 and 2019, Stefan Dercon spent two weeks in Virunga for a series of meeting and field visits. The idea of experimenting innovative approach to foster employment emerged with Sebastien Desbureaux who was leading the Monitoring & Evaluation team at the time. Gracieux Mutaka, Ashley Pople and Natsuno Shinagawa joined the team to design a pilot study - a pilot of what became this Darwin Initiative project that was launched in 2020 and 2021. The results of the pilot were discussed in July 2022 with the Chief Warden and Director of the park, Emmanuel de Merode (who himself is a public servant from the Congolese State). The decision was taken to implement an experiment at scale. Richard Nikema started on the project in summer 2023 as part of his PhD.

The three formal partners of the ongoing Darwin Initiative project are Oxford University (through the Centre for the Studies of African Economies), Virunga Foundation and INRAE (through the Centre for Environmental Economics – Montpellier). The project management team is composed of Professor Stefan Dercon (Oxford), Dr. Ashley Pople (Oxford and World Bank), Gracieux Mutaka Shashi (Virunga Foundation), Natsuno Shinagawa (Virunga Foundation), Dr. Sebastien Desbureaux (INRAE) and Richard Nikiema (INRAE). Online management meetings have taken place on a monthly basis to discuss progress and difficulties. More frequent meetings took place between Ashley Pople, Gracieux Mutaka, Sebastien Desbureaux and Richard Nikiema.

Sébastien Desbureaux visited Virunga once over the last 12 months, in September / October 2024 to work with Marakuja Asbl : a local data collection firm hired by Oxford University to implement midline and endline survey (he also visited the park three times during the first year of the project, in April 2023, October – November 2023, February – March 2024) A visit was also planned for Richard Nikiema but was cancelled because of the volatile security situation in Goma.

Results were discussed during Sébastien's March 2024 visit in a hybrid online / in person sounding board attended by all project members (See attachment). The Director of the park attended this meeting. They were again discussed in Sebastien's visit in September 2024. All activities are implemented along with the representatives of civil society in each village.

3. Project progress

3.1 Progress in carrying out project activities

Output 1: *The results of the pilot conducted in 2021 inform the design of the next phase of the RCT.*

1.1 Organisation of a 1-day workshop with key stakeholders of the pilot (sample of beneficiaries, representatives of the civil society, sample of entrepreneurs, staffs involved in the pilot)
1.2 Results of the workshop are shared and discussed with VNP senior management.
1.3 Results are synthetised in a brief document.

All three activities were successfully completed during the first year of the project. Hereafter, we copy the synthesis provided in the first annual report:

"Results from the large-scale pilot conducted with 360 farmers and 240 small- and medium enterprises (SMEs) were first discussed with the field staff and civil society representatives who played a key role in the implementation of the pilot and conducted monthly monitoring visits to the SMEs. Moreover, the results and the approach to scaling up were discussed extensively with Virunga's Head of Community Engagement (Methode Bagurubumwe Uhoze), the Chief Warden of the Central Sector of the park (Sekibibi) and of the Northern Sector (Eric Kiteka). The results were presented in VNP's annual research sounding board with VNP staff and senior management, including the Director of VNP, Emmanuel de Merode. All decisions relating to project scale up have been cleared by the Director of VNP, so to ensure that they align with the Park's priorities and assessment of the security situation. Finally, these results were summarised in a short document.

The pilot was instrumental in shaping how we screen jobseekers, the design of our casual work intervention (as opposed to a bus ticket subsidy, as originally envisaged) and the decision to provide a bonus to SME owners to motive them to invest time in training the intern. Moreover, the pilot built the capacity of all partners to scale the project to the requisite sample size needed for a rigorous impact evaluation."

In the first annual report, please refer to "Appendix 5 - Virunga Senior Management Sounding Board PPT" delivered at the annual research sounding board. "Appendix 5 - Agenda for Annual Research Sounding Board held in 2023" provides the agenda. See "Appendix 5 - Pilot Write Up" for a summary of pilot lessons learnt. See "Appendix 5 - Communication with Park Director" for proof of ongoing communication with the Director of VNP on key decisions taken on project implementation. See "Appendix 5 - Communication with VNP Staff on lessons learnt from the pilot".

Output 2: *Implementation of a RCT promoting access to off-farm jobs to decrease the loss of natural habitat in VNP.*

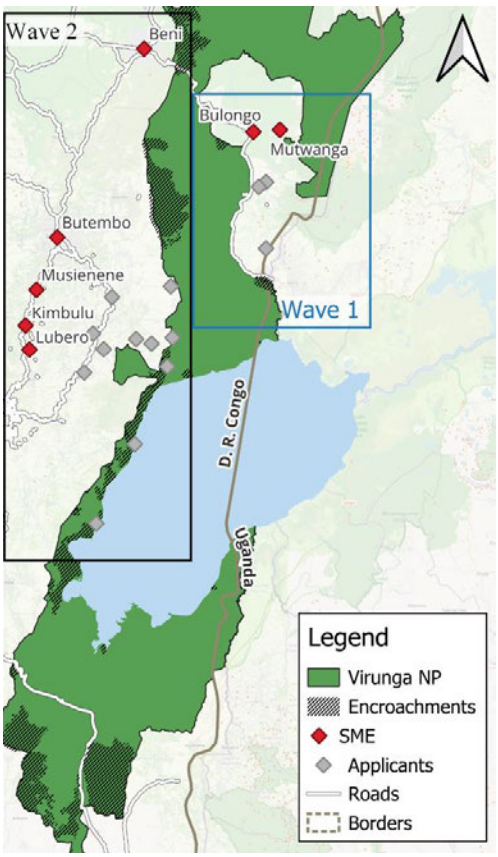
2.1 The programme is advertised through local radio stations.
2.2 All applications are screened.
2.3 1800 eligible applications are randomly selected (by respecting gender equality) ; and randomly assigned to three groups: beneficiaries of the internship programme, beneficiaries of a casual work intervention, and control group
2.4 1200 microenterprises are selected by phone among Virunga Energies clients, and randomly assigned to two treatment arms: those who will have an intern, control group.
2.5 The 600 interns (300 females) start the programme for a period of three months. They receive a monthly visit by a field staff.
2.6 The 600 beneficiaries of the casual work intervention (300 females) work on non-agricultural projects around their villages for up to 10 days.

All six activities were successfully implemented in years 1 and 2 of the project.

The RCT has been implemented in two phases to account for changes in security conditions in the eastern DRC. The first phase commenced in April 2023. The interventions took place between July and November 2023 during the first year of the project. The second phase commenced in March 2024 and the interventions took place between the end of April and July 2024. Across the two phases, the programme was implemented in 14 villages in the surrounds of Virunga National Park with 1) high rates of encroachment and 2) which are nearby key ecological areas.

Village selection: The villages from wave 1 are located next to the ecological corridor linking Queen Elizabeth National Park in Uganda and VNP. This corridor is extremely narrow (about 5kms) and is one the last remaining direct corridor between the east African savannas and the Congo rainforest. The villages from wave 2 are all surrounding Mount Thsiabirimu which is home to a subpopulation of Eastern lowland gorillas (Gorilla beringei graueri) which is endemic to the DR Congo and listed as Critically Endangered.

Figure 2: Zoom study location



In these villages, the main activity is agriculture. Before launching the project, the team contacted community leaders, particularly civil society, to explain the project and provide training on data collection for the application process and baseline survey. State authorities were also contacted for the safety of activities.

Activity #1: An information campaign was then launched to call young unemployed farmers aged 18 to 32 to apply for a three-month internship programme. An application reception center was opened in each village to receive young farmers interested in participating in the program. The advertisement campaign encouraged women in particular to apply, given the low female labour force participation rates in the region. To submit the application, applicants could request the assistance of the project staff to fill in the form. At the time of submitting the application, applicants were invited to complete the baseline survey with a duration of 30 minutes after submitting their application, which covers their past and present work experience, agricultural activity and socio-economic characteristics. In total, 2039 people applied to participate in the programme across both phases.

Figure 1: Advertisment of the programme

Activity #2: All 2039 applications were screened. Applicants were deemed eligible if they were between 18 and 32 years old, farming was their primary livelihood and they cultivated lands in or around Virunga National Parks. Among these 2039 applicants, 1607 were eligible.[3] Among the 1607 eligible applications, 37.36 percent are female. We provide descriptive statistics on the applicants in Appendix "Preliminary results".

During the application process, we collected the sectoral preferences of jobseekers over 13 sectors. Top sector preferences by jobseekers were welding and mechanics, sewing, working for beauty salons (hairstylists etc), working for shops, etc.

Activity #3: In the first phase, the number of eligible applicants was larger than the number of positions available through the programme. Consequently, we randomly sampled 300 of them to participate to the study. However, during the second phase, the number of applicants was slightly lower than initially predicted. We explain this by the change in the security context in nearby areas (but not in our implementation zone) following the expansion of M23 across eastern DRC. The situation created some uncertainty and, understandably, reinforced mistrust towards people outside their communities. Hence, we enrolled all the 1024 eligible applicants as participants of our study in the second phase. In total, our study was conducted with 1,324 participants and ensured at least a third are women.

We randomly assigned 500 participants in the internship arm and 495 participants in the pure control arm, so to maximise our ability to detect treatment effects in the main part of the project. 329 participants were assigned to the casual work intervention.

This lower participation will negatively affect the statistical power of the final study, meaning that it will lower our ability to detect a small change in our outcomes. Our decision to assign more people to the internship arm, compared to the casual work intervention, aimed at minimising the consequences in testing the effect of the primary intervention considered in this study. The

[3] Note: the first annual report mentioned a figure of 160 eligible applicants. This was a typo and the final number is 1607.

volatile security situation has prevented us from organising a third phase of the programme to reach the target.

Activity #4: We match selected jobseekers to our sample of 363 SMEs based on their sectoral preferences (57 at phase 1 and 316 at phase 2).

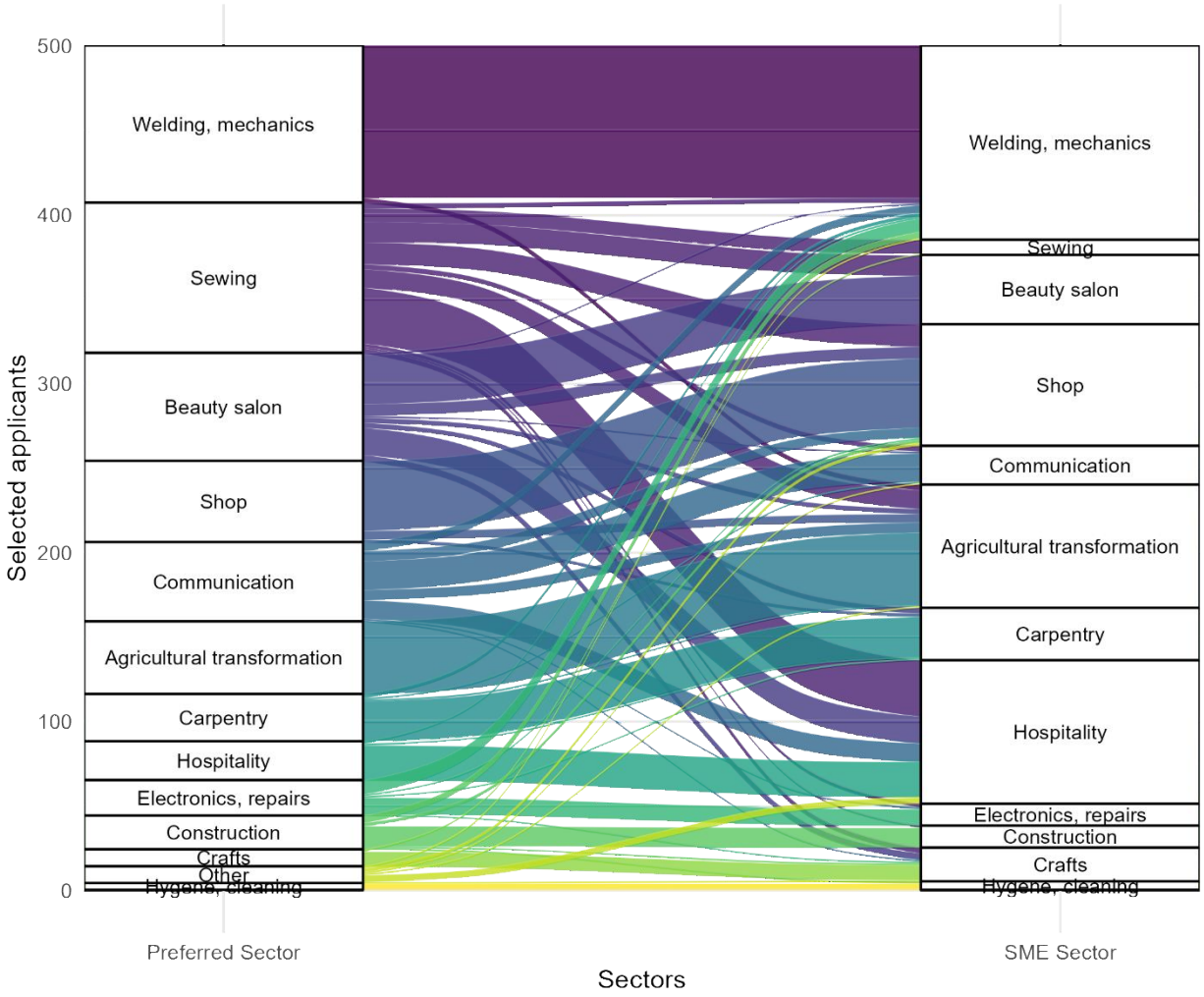
We identify small and medium-sized enterprises (SMEs) in the towns of Lubero, Kimbulu, Musienene, Beni and Butembo and conduct a short survey with them to identify their interest and eligibility in participating in the programme, as well as their sector of activity, their number of employees and their prior experience with interns. A significant share of these businesses operate by using electricity provided by Virunga. We exclude SMEs who are unable to offer interns a substantial number of hours of work per week. We identified fewer SMEs than expected in our regions of interest; therefore, we are unable to randomise them into a pure control versus treatment arm. The selected SME primarily operate in the hospitality sector (with currently 264 employees in the SME operating in this sector), followed by mechanics and welding, carpentry, agricultural transformation etc.

Welding and mechanics emerge as the most requested sector among applicants, with 263 individuals ranking it as their first choice, followed closely by sewing (257 first-choice rankings) and beauty salon services (155 first-choice rankings). There exists substantial alignment between applicant preferences and current employment opportunities in certain sectors—welding and mechanics rank first in applicant preference and maintain substantial employment (217 current employees). However, significant disparities are evident elsewhere: while hospitality ranks only seventh in applicant preferences, it represents the sector with the highest current employment (264 employees). Similarly, carpentry demonstrates a considerable incongruity, ranking eighth in applicant preference despite having the third-highest employment figures (163 employees). These patterns suggest potential information asymmetries regarding employment opportunities or divergences between vocational aspirations and market demands.

The matching between jobseekers and SMEs rely on the “random serial dictatorship” algorithm in R.[4] The algorithm takes jobseekers’ priority order as an input. They are then successively assigned a sector in that order (so the first jobseeker in the ordering gets the first pick and so on) We ran 20,000 matchings by permuting the order in which each jobseeker is considered, and selected the match that maximises the number of jobseekers assigned to their favorite sector.

We summarise the results of the process in the alluvial chart below. The figure illustrates the sectoral distribution dynamics between applicants’ preferences (left axis) and actual placements (right axis) across the sample of 500 randomly allocated apprenticeship treatment participants. This visualisation reveals distinct patterns of preference-placement alignment across sectors. The welding and mechanics sector exhibits particularly strong preference-placement correspondence, characterised by both high applicant demand and substantial vacancy availability, thereby facilitating optimal matching for most applicants expressing preference for this field. In contrast, the sewing sector—which ranked as the second most preferred sector overall—demonstrates considerable preference-placement divergence. Despite strong initial demand, applicants with preferences for this sector were ultimately distributed across multiple alternative sectors due to the structural constraint of limited position availability. The hospitality sector presents a notably inverse pattern, with relatively modest applicant preference rates juxtaposed against substantial apprenticeship availability. This supply-demand asymmetry positioned the hospitality sector as a critical absorption mechanism for applicants whose primary sectoral preferences could not be accommodated within the constraints of the available placement distribution.

[4] Thilo Klein (2018). Analysis of Stable Matchings in R: Package matching Markets. The Comprehensive R Archive Network. URL https://cran.r-project.org/package=matchingMarkets.

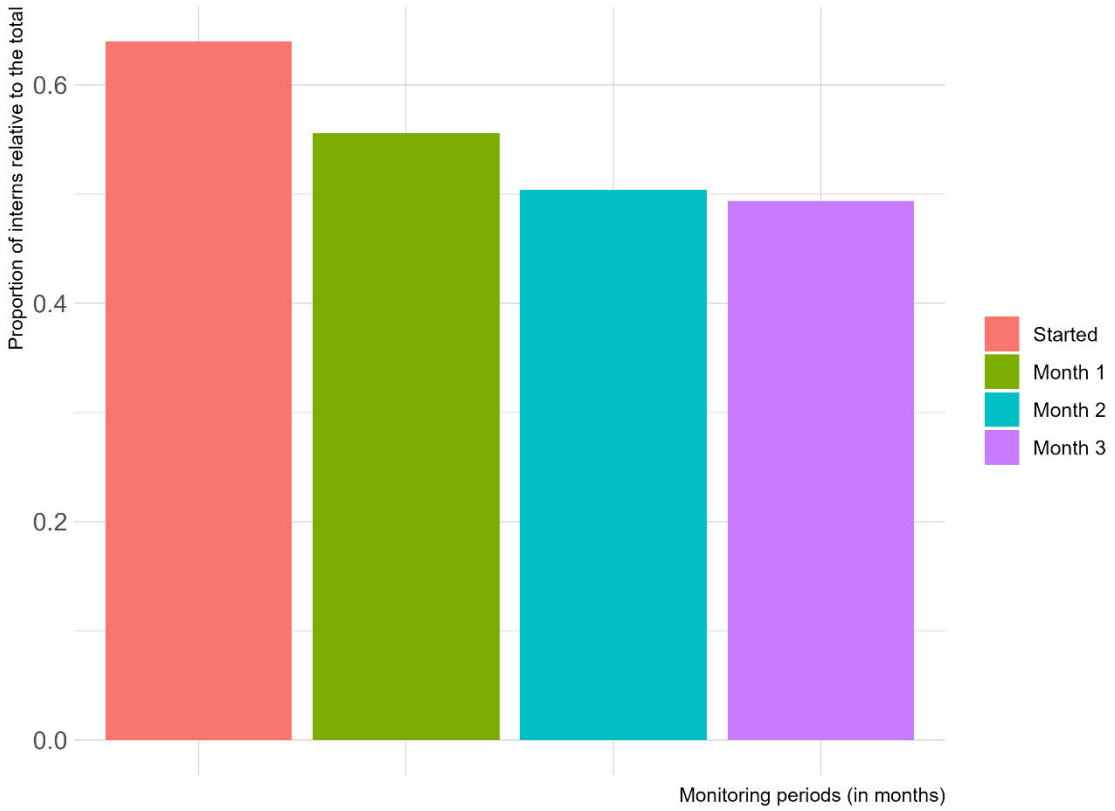


Activity #5: 79 interns (26 women) in phase 1 participated in the internship programme between August and November 2023. Our field staff conducted monthly visits to confirm their presence in the SME. 421 interns (167 women) in phase 2 were invited to commence their internship in April and May 2024.

In the figure below, we display the percentage of jobseekers assigned to the internship arm who started the programme and were still present at the end of the first, second and third month. Across the two waves, 63% of jobseekers who were assigned to this programme started it. Of them, most finished the programme.

Preliminary analyses reveal that the distance between the place of origin of the jobseeker and the location of the SME is the primary determinant of whether a jobseeker started the internship or not, with jobseekers living further away from the SME being less likely to start. Furthermore, we measured at baseline the “self-efficacy” of applicants using standardised tools. A widely used scale in psychology, self-efficacy corresponds to the beliefs of individuals regarding their capacity to act in the ways necessary to reach specific goals. We do find a positive correlative between self-efficacy and the take-up of the programme.

These preliminary analyses do not reveal a difference in take-up between male and female participants.



Activity #6: 78 farmers (28 women) in phase 1 participated in the casual work programme between August and November 2023. 227 farmers (90 women) in phase 2 were invited to commence their casual work programme in May and June 2024. Participants who started working completed their full hours. Note that this treatment arm was formally amended from the labelled cash transfer intervention at the start of the grant period due to security reasons.

Please refer to “Appendix 4 – Baseline Survey - Wave 1” and “Appendix 4 – Baseline Survey - Wave 2” for recruitment information.
Please refer to “Appendix 4 – SME Confirmation Participation - Wave 1” for SME confirmations at phase 1.
Please refer to “Appendix 4 – SME Confirmation Participation - Wave 2” for SME confirmations at phase 2.
Please refer to “Appendix 4 – Confirmation of Placement of Interns in SME - Wave 1” for interns' participation at phase 1.

Output 3: *Monitoring of VNP’s habitats and wildlife in the area of intervention.*

3.1 Aerial census are conducted by Virunga staffs in the project areas to monitor encroachments.
3.2 Satellite images are analysed by Virunga staffs in the project areas to monitor encroachments (Planet Basemap data and Sentinel 1)
3.3 Foot patrols and camera traps allow to estimate species presence and abundance.

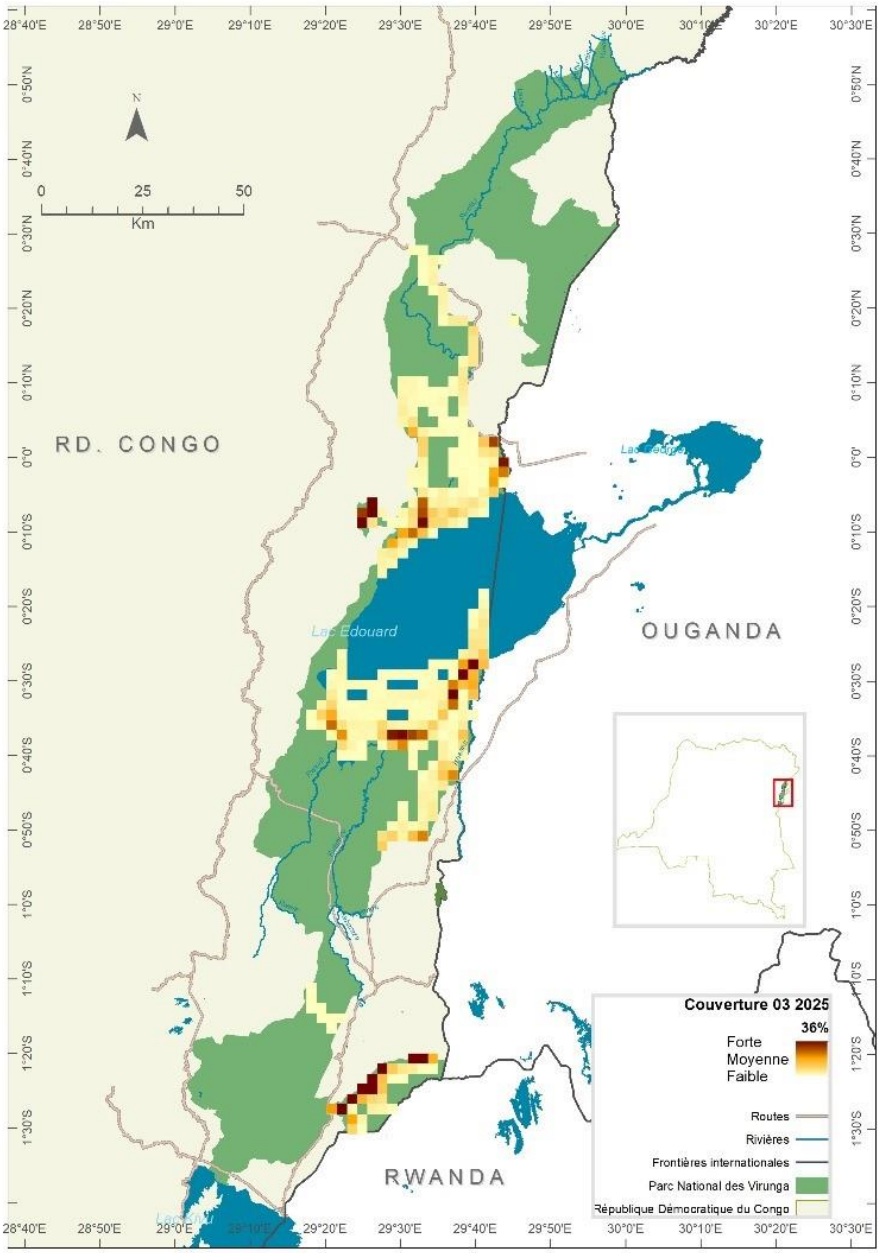
All activities from output 3 were conducted by the Conservation Department of VNP and its “Airwing” (aviation) department along our activities.

Activity #1: Aviation data for the period have not yet been compiled and will be included in the forthcoming report.

Activity #2: Planet base map data were analysed to map encroachments. These analyses are mapped in the map below. In this region of the park, encroachments have remained stable since the start of the project.

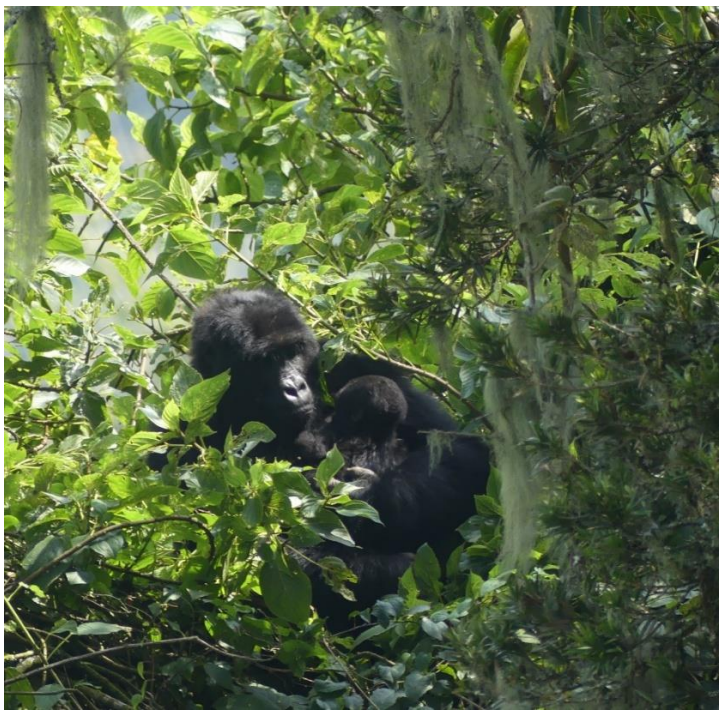
Activity #3: In the northern sector of VNP, park rangers have conducted 1,745 patrols in 2024, covering a distance of 15588 kilometres.

Figure 3: Patrol coverage in 2024 (source: M&E Department VNP)



Wildlife monitoring activities are particularly important in Tshabirimu where two families of Eastern lowland gorillas are followed on a daily basis. In 2024, 942 patrols were organised in the Tshabirimu sub-sector, 76% of them being gorilla monitoring patrols.

Figure 4: Kavanga (infant) and Espoir (juvenile) (Source: Benoit Ishara, VNP monitoring programme)



In 2024, two notable events happen. First, one birth was recorded in one of the two families. Considering the small size of the population (8 individuals), this was significant conservation progress. Second, the VNP is working with GRACE's gorilla sanctuary (www. gracegorillas.org), located in North Kivu as well, on the reintroduction of four individuals from the sanctuary in Tshabirimu. In 2024, the four gorillas were brought from the sanctuary to Tshabirimu. In the addition to the VNP (notably, Benoit Ishara) and GRACE teams, the project is being monitored by two international primatologists. The four gorillas were first installed in an enclosed area to familiarise them with the area's terrain before releasing them into the wild. This happened less than two months later.

Important community engagement activities are happening, and our Darwin project is part of them.

Output 4: *Quantitative impact evaluation of the RCT on people and nature.*

4.1 A baseline survey is organised when eligible people apply to the programme, prior to randomisation

4.2 A midline survey is organised with the 1800 participants three months after the start of the job programme (corresponding for the intern to the final week of the internship).

4.3 An endline survey is organised with the 1800 participants six months after the start of the job programme.

Activity #1: We successfully completed a baseline survey with 2039 applicants, of whom 1324 form our study sample.

Activity #2: A midline survey was successfully conducted with 283 participants within one month of the end of the internship or three months after the start of the job programme in phase 1. For phase 2, the midline survey was conducted with 930 participants. We took many measures to minimise attrition – with a good degree of success (now only 6 percent). We completed the midline survey for phase 2 in August 2024.

Activity #3: An endline survey was completed in mid-May 2024 for Phase 1 and March - April 2025 for Phase 2.

The endline for phase 2 was initially scheduled for January 2025. During this month, the city of Goma fell under the control of the M23 militia. While the city is located over 300kms from our intervention site, it is the home base of the data collection firm we contracted, Marakuja Absl. With Darwin's approval, we delayed the start of the endline to March 2025. In Mid-April 2025, Marakuja successfully completed data collection – though some data cleaning tasks are still pending. Overall, we were able to find 91% of study participants at endline, with attrition being similar in the different treatment groups.

Please refer to "Appendix 4 – Baseline Survey - Wave 1" for phase 1 recruitment information.
Please refer to "Appendix 4 – Baseline Survey - Wave 2" for phase 2 recruitment information.
Please refer to "Appendix 4 – Midline Survey - Wave 1" for midline survey information.
Please refer to "Appendix 4 - Midline Survey - Wave 2" for endline implementation survey
Please refer to "Appendix 4 – Endline Survey - Wave 1" for midline survey information.
Please refer to "Appendix 4 - Endline Survey - Wave 2" for endline implementation survey

Output 5: *Results are summarised and shared with different audiences.*

5.1 Data are analyzed.
5.2 Results are summarised in a working paper and submitted to a peer-review journal.
5.3 Results are summarised in policy briefs.
5.4 Results are shared with VNP staffs and key stakeholders during two meetings after the midline and after the endline.

Given the difficult context in the field, we dedicated most of our effort to outputs 1 to 4. The activities for output 5 are currently in progress, and we expect to complete them by the end of the project. We have already analysed baseline data collected during both phases and the midline data, as well as administrative data collected during the implementation of the interventions (i.e., monthly reports on interns or attendance registry for casual workers). Some of these analyses were included in the previous sections of this report.

Results will first be summarised and disseminated with the VNP staff and more broadly upon completion of the endline survey.

Richard Nikiema presented initial results during the 2024 "Forest & People: from Skyview to Local Dynamics" workshop organised by the Paris School of Economics (see the Appendix Presentation_Aussois.pdf). Sébastien Desbureaux is scheduled to present an update in the 2025 edition of the workshop (see programme here).

3.2 Progress towards project outputs

Output 1: *The results of the pilot conducted in 2021 inform the design of the next phase of the RCT.*

SMART indicators:

1. *Workshop with stakeholders (1 meeting with representatives of the civil society, entrepreneurs, parks' staff and project team)*
2. *Discussion with VNP top management (1 meeting)*

Please refer to Section 3.1 above for a summary on this output and indicators.

Output 2: *Implementation of a RCT promoting access to off-farm jobs to decrease the loss of natural habitat in VNP.*

SMART indicators:

1. *Eligible population are informed of a job-access programme (number of radio advertisments, number of posters in eligible villages).*
2. *600 (300 women) consented eligible participants benefit from a subsidized internship programme.*
3. *600 (300 women) consented eligible participants benefit from a casual work intervention.*
4. *600 (300 women) consented eligible participants are kept as control group.*

In total for the two phases of our analysis, 2039 farmers (752 women) applied for the three-month internship programme, of whom 1607 farmers (603 women) were deemed eligible.

Of this eligible applicants, 500 (200 women) were randomly selected and invited to participate in the internship programme. 320 participant (127 women) started the internship, of whom 247 (102 women) completed the internship three month later.

329 eligible applicants (124 women) were randomly selected and invited to participate in the casual work programme. 181 (71 women) commenced and finished the casual work programme.

495 eligible applicants (193 women) were assigned to the control group in support of the randomised trial..

Please refer to “Appendix 4 – Baseline Survey - Wave 1”, “Appendix 4 – Baseline Survey - Wave 2” and “Appendix 5 – Preliminary Results”.

Output 3: *Monitoring of VNP’s habitats and wildlife in the area of intervention.*

SMART indicators:

1. *# Aerial census conducted around the areas targeted by the programme 3, 6 and 12 months after the start of the job programme.*
2. *# Satellite image analysis in the areas targeted by the programme 3, 6 and 12 months after the start of the job programme.*

Please refer to Section 3.1 above.

Output 4: *Quantitative impact evaluation of the RCT on people and nature.*

SMART indicators:

1. *1800 baseline surveys are organised (a few weeks before the start of the intervention).*
2. *1800 midline surveys are organised (2.5 months after the start of the programme = in the last two weeks of the internship programme).*
3. *1800 endline surveys are organised (6 months after the start of the programme = 3 months after the end of the internship).*

699 baseline surveys were completed Phase 1 and 1340 surveys in Phase 2. 281 midline surveys were organised in the month immediately following the end of the internship programme in Phase 1 and 930 during phase 2. This corresponds to a participation rate of 91% - a substantial response rate. Importantly, we were able to find a similar share of respondents for all groups (interns, casual jobs and control).

For the endline, we successfully completed 288 surveys six months after the end of the internship at phase 1. We are now wrapping up endline data collection for phase 2.

In addition, we collected monitoring surveys to track the take up and drop out from our job programmes. 100 monitoring surveys were conducted at the start of the internship in Phase 1

and 400 in Phase 2. Subsequent monitoring surveys indicated which interns are still working in the SME, as they were conducted by field staff visiting the SME:

- 328 monitoring surveys were conducted at the end of the first month of the internship programme.
- 317 monitoring surveys were conducted at the end of the second month of the internship programme.
- 312 monitoring surveys were conducted in the last month of the internship programme.

Please refer to “Appendix 4 – Monitoring Interns Survey Month 1 - Wave 1”, “Appendix 4 – Monitoring Interns Survey Month 2 - Wave 1” and “Appendix 4 – Monitoring Interns Survey Month 3 - Wave 1” for intern presence confirmation.

Output 5: *Results are summarised and shared with different audiences.*

SMART indicators:

1. *A working paper summarising preliminary results is shared in open access within 9 months of the end of the job programme.*
2. *A paper is submitted for peer-reviewed publication within 12 months of the end of the job programme.*
3. *Policy briefs in different formats summarising results within 12 months of the end of the job programme.*
4. *Two meetings with VNP and stakeholders are organised to share the results.*

These activities are currently in progress, and we expect to complete them by the end of the project.

3.3 Progress towards the project outcome

Outcome: *An evidence-based innovative strategy decreases threats on natural habitats, protects biodiversity and decreases poverty in Virunga National Park. Results are scalable to other contexts.*

Indicator 1: *Beneficiaries of the job-market intervention saw their non-agricultural employment status improving three and six months after the start of the programme (salaried job and casual employment outside farming, disaggregation by gender. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator)*

While writing this second annual report, we are wrapping-up data collection. Therefore, we have not had the time yet to finalise our statistical analyses. We provide some preliminary results below.

During the midline survey which took place one month after the end of the internship, we find that 50 percent of interns report having a non-agricultural job in the last 30 days. Moreover, interns are 10 percentage points more likely to report a non-agricultural job in the last 30 days relative to the control group and this difference is statistically significant at the 5 percent level. This, however, remains to be confirmed through regression analyses. Relative to the control group, the casual work group is also 10 percentage points more likely to engage in casual work in the last 30 days which is significant at the at the 1% threshold. Relative to the casual work group, the internship group is 10 percentage points less likely to have engaged in casual work in the last 30 days (difference significant at the 5 percent level) and 10 percentage points more likely to engage in non-agricultural employment in the last 30 days (difference significant at the 1 percent level).

Endline data will be analysed as soon as data collection is complete.

Please refer to “Appendix 5 - Preliminary Results” for preliminary results.

Indicator 2: *Poverty decrease among programs' participants three and six months after the start of the programme (multidimensional poverty including: reported non-agricultural incomes, food consumption).*

We currently do not have all the data needed to estimate intent-to-treat effects on poverty outcomes by the end of Year 2. We collect several variables to measure the effects of our intervention on poverty, including non-agricultural income (US dollars per day), food security (as proxied by the Food Consumption Score widely used by the World Food Programme) and assets. We also measure subjective wellbeing in the form of Cantril's Ladder of Life Satisfaction, which is widely used in Gallup World Poll surveys.

At midline, interns report a daily non-agricultural income that is $0.08 (per day) lower than the control group in the 30 days preceding the survey. This difference is, however, not statistically significant. However, daily workers' report non-farm income that is $0.97 higher per day than the control group. This difference is statistically significant at 5 percent level.

Indicator 3: *Participation in the interventions decrease the demand for farmlands inside and outside the park (area farmed by beneficiaries, area farmed by the family of the beneficiary, area of farmlands owned by the beneficiary. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator).*

We are so far able to present simple mean comparisons between treated and control participants at midline. Drawing on the midline results for our sample of 1324 farmers, we observe that the internship group spend fewer days farming in the 7 days before the survey took place (-0.2 days) but they cultivate more farmlands (a difference of 1.3 squares of 25mx25m) relative to the control group. Similarly, the casual work group spend fewer days working in farms (-0.02 days) but, unlike interns, they also cultivate fewer farmlands relative to the control group (a difference of 0.34 squares of 25mx25m). Importantly, none of these differences is statistically significant at conventional levels. Updated analyses with regressions results and data from the endline will be presented in the final report.

Indicator 4: *Increase in wildlife observation in targeted areas of VNP one year after the end of the programme (diversity of species and abundance).*

This indicator will only be measured after the end of the programme; therefore, it is not relevant at this stage.

Indicator 5: *Lessons learnt are of interest for different audience, as measured by academic citations, attendance at specific events, audience of podcast and blogs (measured one and three years after the end of the programme).*

This indicator will only be measured after the end of the programme; therefore, it is not relevant at this stage.

3.4 Monitoring of assumptions

Assumptions relating to the outcome

Assumption 1: *Participation in the programme will facilitate access to non-farming employment.*

> **Comments:** As indicated in Section 3.3, the job interventions facilitate access to non-farming employment at midline for a subset of the sample. This assumption will be further verified upon completion of Phase 2 with a larger sample size.

Assumption 2: *Access to non-farming employment will contribute to poverty reduction.*

Comments: We expect to have all the data needed to estimate intent-to-treat effects on poverty outcomes by the end of Year 2.

Assumption 3: *An increase in non-farming employment will decrease demand for farmlands inside and around VNP.*

Comments: As indicated in Section 3.3, the job interventions reduce the amount of cultivated land relative to the control group for a subset of the sample at midline, although this difference is not statistically significant. This assumption will be further verified upon completion of Phase 2 with a larger sample size.

Assumption 4: *Decreased demand for farmlands inside and around VNP will have a positive impact on the number of habitats.*

Comments: We will verify this assumption upon completion of the endline survey in Phase 1 and 2.

Assumptions relating to outputs

Assumption 1 (Output 1): *Beneficiaries and stakeholders of the pilot are available to engage in the discussion with the team.*

Comments: We successfully held several discussions with various stakeholders of the pilot, ranging from civil society representatives to senior management of VNP. We extracted important lessons from the pilot that directly shaped the implementation of the RCT.

Assumption 2 (Output 2): *Enough people are interested in participating to an experimental job programme.*

Comments: As indicated in Section 3.2, the high application rates and take up of the job interventions suggest that there is a high demand for such interventions in a region where non-agricultural employment opportunities are limited.

Assumption 3 (Output 3): *Aerial census is conducted accordingly to the plan, despite numerous logistical constrains and insecurity.*

Comments: Aviation data for the period have not yet been compiled and will be included in the forthcoming report.

Assumption 4 (Output 3): *Clouds-free satellite images are available.*

Comments: This assumption remains true.

Assumption 5 (Output 4): *Potential participants are willing to participate to a research-informed programme.*

Comments: As indicated in Section 3.2, we experienced high participation rates for our baseline survey and low attrition rates during our first midline survey (6 percent).

3.5 Impact: achievement of positive impact on biodiversity and poverty reduction

Through this project, we envisage that “the biodiversity of Virunga National Park is protected and people are thriving”. Through our randomised control trial, we will be able to measure the direct impact of our programme on poverty alleviation for participating farmers in the short term. We will also measure changes in their demand for agricultural land and thus their impact on natural habitats. We will further verify the impact on biodiversity conservation using other data sources, as noted in Section 3.1.

With VNP as an implementation partner, there is a clear pathway to scale from RCT to a fully-fledged policy programme. As a British-registered charity, the Virunga Foundation signed a public-private partnership with the Congolese authorities in charge of nature conservation (ICCN) to manage VNP, with the Director of the Park acting as both CEO of VF and the Provincial Director of ICCN. We have engaged the Director (Emmanuel de Merode) and the leadership team during the design, pilot and now scale up phase of the project. The Director of the Park is particularly interested in the results, as he aims to create over 100,000 jobs in the coming decade, so that the Park becomes an engine for green growth in North Kivu. VNP has already delivered green electricity to 12,000 customers in 1,500 SMEs since 2016 and spent $5 million to support entrepreneurship programmes. The park is particularly interested in understanding how to move farmers outside the park and support the growth of these SMEs.

Beyond Virunga, the interdependency of socio-economic development and natural habitat preservation has highlighted the need to find an effective approach; yet such knowledge remains limited. This current project has the potential to inform a broader range of actors working in this field, including the ICCN in the DRC government, and the wide range of global organisations, such the World Bank, FCDO and EU, who are interested to find more economically sustainable ways of protection carbon sinks and biodiversity in poor and fragile places.

4. Project support to the Conventions, Treaties or Agreements

The project is implemented together with the Government entity in charge of National Parks of the DRC (ICCN). As such, our project is helping ICCN to make park's conservation inclusive and sustainable as detailed in its strategic documents (« Stratégie Nationale de la Conservation de la Biodiversité », 2022-2032).

Our project makes substantial contributions to multiple international biodiversity conventions and agreements, directly supporting both Democratic Republic of Congo's national commitments and broader global conservation goals:

Convention on Biological Diversity (CBD): Our project directly contributes to the implementation of several targets within the Kunming-Montreal Global Biodiversity Framework (GBF), particularly target 1 to reduce biodiversity loss, target 4 on endangered species extinction, target 21 on ensuring local communities' equitable participation in decision-making related to biodiversity - while supporting DRC's National Biodiversity Strategy and Action Plan (2016-2020).

UNESCO World Heritage Convention: Virunga National Park was inscribed as a World Heritage site in 1979 and has been on the List of World Heritage in Danger since 1994. Our project directly addresses pressures that threaten the park's Outstanding Universal Value, particularly agricultural encroachment identified as a key threat in UNESCO monitoring reports. By reducing farming pressure through job creation, we contribute to DRC's obligations to protect and conserve this globally significant site.

Convention on International Trade in Endangered Species (CITES): The project area supports populations of Appendix I-listed species including Eastern lowland gorillas (*Gorilla beringei graueri*). Our habitat protection approach complements CITES' trade restrictions by addressing threats at the source through people-centred conservation.

Sustainable Development Goals (SDGs): While technically not a convention, our project demonstrates exemplary integration of biodiversity conservation with poverty reduction – a core Darwin Initiative priority – by advancing multiple SDGs simultaneously:

- SDG 1 (No Poverty) through income generation
- SDG 8 (Decent Work and Economic Growth) through job creation
- SDG 15 (Life on Land) through habitat protection and biodiversity conservation
- SDG 17 (Partnerships for the Goals) through our multi-stakeholder approach

The project's randomised control trial methodology further contributes to global conservation knowledge by generating rigorous evidence on job creation approaches that can reduce

agricultural encroachment into protected areas – addressing the critical conservation-development nexus that lies at the heart of the Darwin Initiative's mission.

5. Project support for multidimensional poverty reduction

This project prioritises areas where agricultural activities encroach conservation efforts undertaken by VNP and, hence, where reducing the demand for agricultural land is a priority to protect natural habitats and biodiversity. These areas have been identified in collaboration with the VNP.

Within these areas, we target highly vulnerable and marginalised farmers, even within a population where 90+ percent of live below the poverty line on average. Participants are defined to be eligible if their primary livelihood was farming or livestock rearing, did not have a full-time non-agricultural job or in full-time education, between 18 and 32 years old and available to migrate to the nearby city to commence the internship programme within the next three months. Our baseline data indicates that our sample earn on average US $19.13 per month and they work three days on average per week. These figures suggest that they earn less than $0.63 per day on average, indicating a high level of poverty. The average proportion of cultivated land is 0.24 ha.

Moreover, those farming within the park are also more subject to the forces of armed groups. Therefore, any efforts to draw these farmers out of farming into non-agricultural employment should boost their income and wellbeing. We test this hypothesis through the RCT.

Please refer to “Appendix 4 – Baseline Survey - Wave 1”, “Appendix 4 – Baseline Survey - Wave 2” and “Appendix 5 – Preliminary Results”.

6. Gender Equality and Social Inclusion (GESI)

Our project intends to increase non-agricultural employment access to both men and women in the eastern DRC. Congolese women experience lower development outcomes then men, driven by a limited access to schooling and higher monetary poverty (see Gender Development Index for the DRC). Of the 3291 adult farmers recorded in the pilot census within VNP in 2021, 58% are women, highlighting the importance of farm activities for women in North Kivu. Meanwhile, women represent a minority of employees within microenterprises (about 15% and less than 2% of SME owners).

There was strong interest from women to participate in our programme, with 37% of applications submitted by women across both phases. We randomised eligible applicants into our three treatment arms, stratifying by gender and ensuring that women comprise at least a third of our sample (41% in phase 2). Moreover, implementation staff were asked to provide additional support to female participants, for instance by addressing any concerns raised by SME owners. As a result, women were slightly more likely to complete the internship programme compared to men (67% of women compared to 60% of men).

We intend to disaggregate our results by gender once we have collected data on our entire sample. Thus, this project will be an opportunity to explore the barriers to non-agricultural jobs for women (e.g., discrimination, gender-specific selection of sectors).

Please quantify the proportion of women on the Project Board[5].	33%
Please quantify the proportion of project partners that are led by women, or which	0 The Virunga team (comprised of one woman and one man) 1 The Oxford team (comprised of one woman and one man)

[5] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

have a senior leadership team consisting of at least 50% women[6].	

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	X
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

7. Monitoring and evaluation

Our primary tool to monitor and evaluate the impact of the project is a state-of-the-art impact evaluation methodology – a randomised control trial (RCT). Our key hypothesis is that offering a non-agricultural job will lead to higher non-agricultural employment and migration, and thus reduce agricultural activity and demand for agricultural land. This will in turn reduce the impact of these agricultural activities on natural habitats and biodiversity. We survey our sample within one month and approximately six months after the end of the internship. Through these surveys, we measure i) non-agricultural employment status, ii) agricultural activity, iii) demand for agricultural land (at both the individual and household level) and iv) migration, among other variables capturing poverty and potential mechanisms. To analysis our survey data, we follow a pre-analysis plan registered through the AEA Trial Registry under ID AEARCTR-0009480 (https://www.socialscienceregistry.org/trials/9480). The survey data is complemented by an aerial census, satellite imagery, patrol and camera trap data to measure changes in wildlife and natural habitats in the area of our interventions.

To track outputs and activities, we collect administrative data throughout the intervention lifecycle to measure application, take up and drop out rates and qualitative reasons underlying these trends so to inform future design of such interventions. Our field team surveys interns on a monthly basis during the three-month internship programme to confirm that they are indeed still working at the firm and track the types of tasks assigned to them.

All partners are actively engaged in overseeing the RCT. The University of Oxford and INRAE/ Université de Montpellier (through the Centre for Environmental Economics – Montpellier) are responsible for ensuring the integrity of the trial, designing survey instruments and collecting the data via a locally-based enumerator team. Virunga Foundation is primarily responsible for implementing the two job interventions (internship and casual work), but the team has also led the application process, baseline survey and ongoing monitoring activities throughout the implementation of the interventions.

[6] Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

8. Lessons learnt

On April 21st 2025, Virunga celebrated its centenary. Looking ahead, the park's team are striving towards making conservation effective and fair for the next 100 years – bringing development and stability to a highly impoverished region. Creating jobs for the five million people living around the park will be key in this objective.

The central goal of the current experiment is to lay the foundation for job programmes that, at scale, can benefit the poorest households and those most impacted by regulations relating to land access. While we are still analysing the data, we draw the following lessons from implementation thus far.

First, we confirm that there is a high demand to switch careers outside farming – as exemplified by the number of applications we received to our internship programme despite the difficult security context and the uncertainty it brought.

Second, our data confirm that the barriers farmers face around parks like the VNP to access non-agricultural jobs are significant. They live far from employment opportunities (which implies that migration would be required to access non-agricultural work) and have a more constrained social network (i.e. they know fewer people working in SME or SME owners than those who were able to find a job without a programme like ours). They are also less educated than them. Those barriers are likely more pronounced for women: they represent around 10% of current SME employees, while 36% of the applicants to our programmes are women. This means that without dedicated programme like the one tested in this Darwin project, vulnerable populations living around parks are less likely to benefit from the new jobs that are created with the structural transformation of economies.

Third, we successfully implemented the two phases of the randomised control trial, although we only succeeded in recruiting 1324 out of the 1600 targeted participants (82%). We explain this lower participation by the change in the security context that happened in 2024 while we were implementing the second phase of the programme. Indeed, during the first phase of the programme, we had more interested participants than available spots.

Fourth, even when screening candidates based on their motivations (e.g., people needed to go fill an application form in person to apply to the project – making the application "costly" in terms of time), 37% of the participants to whom we offered an internship were not able to take up the opportunity. Preliminary analyses suggest that participation rate were lower for those who live further away from the SME (even though we covered transportation costs) and for those having a lower "self-efficacy" as defined earlier in the document. Anecdotally for the moment, we also find that many interns came back to their village after the programme ended instead of trying to secure a job in town. In their villages, job opportunities are scarce outside farming. Endline data will allow us to document this quantitatively. They will also allow us to quantify the effect on job market outcomes.

The effect on access to jobs on the demand for lands – and in turn the protection of the park – remain to be analysed when we will have the final data.

9. Actions taken in response to previous reviews (if applicable)

Throughout the report, we clarified a few points raised by the reviewer of the first annual report. This includes:

- We ensured that Darwin is mentioned on the project webpage (right part of the page, https://www.csae.ox.ac.uk/from-farms-to-jobs-job-creation-to-preserve-natural-ecosystems-in-eastern-drc)
- We discussed the consequence of the lower participation rate in Section 3.
- We annexed pictures of field activities to the report (and included some of them in this main report).
- We reported numbers for both phases together in Annex 1, instead of reporting data for each phase separately.

- We clarified that Government organisations are involved through the park. Notably, the chief warden of the park is a public servant of the Congolese state. He also serves as the head of Virunga Foundation – our implementation partner. The State and the Virunga Foundation work hand-in-hand through a Public Private Partnership signed in 2015 for a duration of 25 years.
- We mentioned that the research dimension of the project is important in terms of legacy, beyond the context of the VNP.

10. Risk Management

Prior to the start of the programme, the security situation deteriorated in Eastern DRC. This change of context was discussed with the Darwin team and the activities were slightly modified prior to the start of the grant. The most important change was the replacement of a secondary treatment arm. We initially intended to provide a transportation voucher to a subset of participants not selected in the internship programme. This voucher would have lowered the cost of job-search for participants as job opportunities are located kilometres away from their place of residence. The new security condition means that travelling has become more dangerous. Therefore, we saw it as unethical to encourage participants to move on their own without any type of supervision. Consequently, this secondary treatment was replaced by a local short-term job opportunity.

Over the last 12 months, the security situation drastically changed in Goma – 300kms south of our implementation zone. This indirectly impacted our project because several project members live in Goma, including our data collection firm. We requested a change to Darwin in February 2025 following an upsurge in violence in Goma to wait until the security situation calmed down before resuming activities. This requested was granted by Darwin. Activities resumed in March 2025.

11. Sustainability and legacy

This project is designed to produce causal evidence on the impact of job programmes on employment outcomes and the protection of the natural environment. The lessons are directly applicable to the context of the VNP for the possible implementation of future policies to promote an effective and fair, people-centred conservation model. Some of our early results show that existing jobs do not benefit people the most impacted by conservation activities - a key finding to motivate further consideration about the inclusivity of job programmes in the context of conservation.

The lessons are also valuable across the continent where farming remains the primary livelihood for most adults, but where job markets are starting to transform with the rising of non-agricultural jobs. Understanding the impact of this transition on the demand for agricultural lands is therefore crucial.

Community representatives who are helping us to implement the programme are extremely supportive of the approach. Likewise, park rangers operating in the Northern Sector of the park, where the activities are implemented, value the community-engagement approach of such programme. In the two waves of implementation, over 2,000 persons came to apply to the programme for only 600 available positions. As detailed in the previous sections, a majority of selected participants did start and finish the programme. This highlights that a demand for such programme exists. We will know whether our job programme has lasting impacts once endline data are collected in a couple of weeks. Barriers to access jobs are, of course, immense for this population given the limited number of jobs available, the necessity to migrate from their village of origin to a nearby city to have a job, their lack of personal connection with SME owners etc.

In addition, internal capacities within Virunga have been strengthened. This is notably the case for Gracieux Mutaka, who started as a M&E officer during the pilot of the programme, and who is now in charge of the entire implementation of field activities. In November 2024, Gracieux Mutaka spent six weeks in Montpellier to work with Sébastien Desbureaux on the analysis of the impact of the project. He has also applied to a master programme in economics in a European university (the University of Antwerp in Belgium that has a strong development programme), with

the objective to pursue towards a PhD later. In addition, Richard Nikiema (a citizen of Burkina Faso) started working on the project as an intern during his masters programme. He is now a PhD student. As part of this Darwin project, Richard will visit the University of Oxford's Centre for the Study of African Economies from April to June 2025. Both Gracieux and Richard are co-authors on the academic paper.

Senior management at Virunga National Park eagerly await results from this project to determine whether to scale up the interventions within the Park.

On a financial side, this Darwin Initiative grant allowed Sébastien Desbureaux to secure additional funding through the French's Agence Nationale de la Recherche as part of his Assistant Professor position (Chaire de Professeur Junior). Sébastien was able to provide an additional 50,000 euros (43,000 GBP, roughly 1/4 of the DI grant) to support the implementation of the new treatment arm (see Section 10), and to organize the visit of Gracieux Mutaka to Montpellier.

12. Darwin Initiative identity

Darwin Initiative has been displayed on all institutional and external communication about the project, such as the project webpage here. It is well known among the Virunga National Park senior management and staff that Darwin Initiative is the primary funder of the project. Future publications and policy-facing messaging, including on social media, will include reference to the Darwin Initiative and/or the Biodiversity Challenge Fund.

13. Safeguarding

[redacted]

[redacted]

14. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2024 – 31 March 2025)

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total Darwin Initiative	Variance %	Comments (please explain significant
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	**96,325**	**96,325**		

A change request was submitted and approved in February 2025. The reported project expenditure aligns with the revised budget that was approved.

Table 2: Project mobilised or matched funding during the reporting period (1 April 2024 – 31 March 2025)

	Secured to date	Expected by end of project
Matched funding leveraged by the partners to deliver the project (£)	[redacted]	No more additional funds are expected by the end of the project.
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	[redacted]	

15. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes

We intend to submit material here in Year 3, given that Years 1& 2 were largely a development and research phase.

Annex 1: Report of progress and achievements against logframe for Financial Year 2024-2025

Project summary	Progress and Achievements April 2024 - March 2025	Actions required/planned for next period
Impact The biodiversity of Virunga National Park is protected, and people are thriving	Through our randomised control trial, we will be able to measure the direct impact of our programme on poverty alleviation for participating farmers in the short term. We will also measure changes in their demand for agricultural land and thus their impact on natural habitats. We will further verify the impact on biodiversity conservation using other data sources.	
Outcome An evidence-based innovative strategy decreases threats on natural habitats, protects biodiversity and decreases poverty in Virunga National Park. Results are scalable to other contexts.		
Outcome indicator 0.1 Beneficiaries of the job-market intervention saw their non-agricultural employment status improving three and six months after the start of the programme (salaried job and casual employment outside farming, disaggregation by gender. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator)	During the midline survey that took place one month after the end of the internship, we find that 50 percent of interns report having a non-agricultural job in the last 30 days. Moreover, interns are 10 percentage points more likely to report a non-agricultural job in the last 30 days relative to the control group and this difference is statistically significant at the 5 percent level. This, however, remains to be confirmed through regression analyses. Relative to the control group, the casual work group is also 10 percentage points more likely to engage in casual work in the last 30 days which is significant at the at the 1% threshold. Relative to the casual work group, the internship group is 10 percentage points less likely to have engaged in casual work in the last 30 days (difference significant at the 5 percent level) and 10 percentage points more likely to engage in non-agricultural employment in the last 30 days (difference significant at the 1 percent level). Please refer to “Appendix 5 - Preliminary Results” for preliminary results.	By the end of Year 2, we have collected midline data for the two phases of the project, endline data for the first 300 participants and we are now completing collecting endline data for the remaining participants. Implementing all field activities in this context was a challenge, and we have not yet had time to conduct all the statistical analyses. By the end of the project, now that field activities are mostly over, we will be able to focus on the statistical analyses outlined in our pre-analysis plan.

Outcome indicator 0.2 Poverty decreases among programs' participants three and six months after the start of the programme (multidimensional poverty including: reported non-agricultural incomes, food consumption).	At midline, interns report a daily non-farming income which $0.08 (per day) lower than the control group in the 30 days preceding the survey. This difference is, however, not statistically significant. However, daily workers' report non-farming income which are $0.97 higher per day than the control group. This difference is statistically significant at 5 percent level. Please refer to "Appendix 5 - Preliminary Results" for preliminary results.	Same as above. We collect several measures to proxy for poverty, including income, food security, assets and subjective wellbeing.
Outcome indicator 0.3 Participation in the interventions decrease the demand for farmlands inside and outside the park (area farmed by beneficiaries, area farmed by the family of the beneficiary, area of farmlands owned by the beneficiary. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator).	We are so far able to present simple mean comparisons between treated and control participants at midline. Drawing on the midline results for our sample of 1324 farmers, we observe that the internship group spend fewer days farming in the 7 days before the survey took place (-0.2 days) but they cultivate more farmlands (a difference of 1.3 squares of 25mx25m) relative to the control group. Similarly, the casual work group spend fewer days working in farms (-0.02 days) but, unlike interns, they also cultivate fewer farmlands relative to the control group (a difference of 0.34 squares of 25mx25m). Importantly, none of these differences is statistically significant at the conventional levels. Updated analyses with regressions results and data from the endline will be presented in the final report. Please refer to "Appendix 5 - Preliminary Results" for preliminary results.	Same as above
Outcome indicator 0.4 Increase in wildlife observation in targeted areas of VNP one year after the end of the programme (diversity of species and abundance).	First data have been included regarding the population of lowland eastern Gorillas, who recorded one birth during the second year of the project. A first ever reintroduction of four orphan gorillas was also completed. At the time of writing this report, the four reintroduced gorillas are doing well. An aerial consensus has also been conducted in the savanna landscapes.	Data on wildlife observations on targeted areas will be analysed and compiled along with the economic data on the job programme.

Outcome indicator 0.5 Lessons learnt are of interest for different audience, as measured by academic citations, attendance at specific events, audience of podcast and blogs (measured one and three years after the end of the programme).	Richard Nikiema presented the design of the programme in a workshop held in June 2024. These activities will continue in the following months, now that data are collected.	
Output 1: The results of the pilot conducted in 2021 inform the design of the next phase of the RCT.		
Output indicator 1.1 1. Workshop with stakeholders (1 meeting with representatives of the civil society, entrepreneurs, parks' staff and project team) 2. Discussion with VNP top management (1 meeting)	Both the workshop and multiple discussions have taken place. Results from the pilot were first discussed with the field staff and civil society representatives who played a key role in implementing the partners. We also engaged Virunga's Head of Community Engagement and the Chief Wardens of the Northern and Central Sectors. Lastly, the pilot results were presented during the annual research sounding board with VNP staff and senior management, including the director of the park. Please refer to "Appendix 5 - Virunga Senior Management Sounding Board PPT" delivered at the annual research sounding board. "Appendix 5 - Agenda for Annual Research Sounding Board held in 2023" provides the agenda for that event. See "Appendix 5 - Pilot Write Up" for a summary of pilot lessons learnt. See "Appendix 5 - Communication with Park Director" for proof of ongoing communication with the Director of VNP on key decisions taken on project implementation. See "Appendix 5 - Communication with VNP Staff on lessons learnt from the pilot".	Activities are complete.
Output 2: Implementation of a RCT promoting access to off-farm jobs to decrease the loss of natural habitat in VNP.		

1. Eligible populations are informed of a job-access programme (number of radio advertisements, number of posters in eligible villages). 2. 600 (300 women) consented eligible participants benefit from a subsidised internship programme. 3. 600 (300 women) consented eligible participants benefit from a casual work intervention. 4. 600 (300 women) consented eligible participants are kept as control group.	1. 2039 farmers (36% women) applied for the three-month internship programme, of whom 1607 farmers (36% women) were deemed eligible. 2. Of the eligible applicants, 500 farmers (36% women) were randomly selected and invited to participate in the internship programme. 3. 329 eligible applicants (124 women) 4. 495 eligible applicants (1922 women) were assigned to the control group in support of the randomised control trial. Please refer to "Appendix 4 – Baseline Survey - Wave 1", "Appendix 4 – Baseline Survey - Wave 2" and "Appendix 5 – Preliminary Results"	Activities are complete.
Output 3: Monitoring of VNP's habitats and wildlife in the area of intervention.		
1. # Aerial census conducted around the areas targeted by the programme 3, 6 and 12 months after the start of the job programme 2. # Satellite image analysis in the areas targeted by the programme 3, 6 and 12 months after the start of the job programme.	1. An aerial census of wildlife was conducted in the savannas of the park, bordering the project implementation sites in 2024. 2. Planet basemap data were analysed to map encroachments. These analyses are mapped in Figures 1 and 2 (dashed areas). In this region of the park, encroachments have remained stable since the start of the project. 3.	All data will be compiled for the end of project report.
Output 4: Quantitative impact evaluation of the RCT on people and nature.		
1. 1800 baseline surveys are organised (a few weeks before the start of the intervention). 2. 1800 midline surveys are organised (2.5 months after the start of the programme = in the last two weeks of the internship programme). 3. 1800 endline surveys are organised (6 months after the start of the programme = 3 months after the end of the internship).	1. 1324 baseline surveys were completed. 2. 1211 midline surveys were organised in the month immediately following the end of the internship programme. 3. 288 endline surveys were organised six months after the end of the internship programme with participants of phase 1. We are finishing data collection for the second phase.	Endline survey for Phase 2 will be finished in early May 2025.

	In addition, we collected monitoring surveys to track the take up and drop out from our job programmes. Please refer to “Appendix 4 – Baseline Survey - Wave 1” for phase 1 recruitment information. Please refer to “Appendix 4 – Baseline Survey - Wave 2” for phase 2 recruitment information. Please refer to “Appendix 4 – Midline Survey - Wave 1” for midline survey information. Please refer to “Appendix 4 - Endline Survey - Wave 1” for endline implementation survey.	
Output 5: Results are summarised and shared with different audiences.		
1. A working paper summarising preliminary results is shared in open access within 9 months of the end of the job programme. 2. A paper is submitted for peer-reviewed publication within 12 months of the end of the job programme. 3. Policy briefs in different formats summarising results within 12 months of the end of the job programme. 4. Two meetings with VNP and stakeholders are organised to share the results.	These activities are currently in progress, and we expect to complete them by the end of the project.	Data collected through the baseline survey and midline survey (Phase 1 only) have already been analysed. Data collected through the midline survey (Phase 2) and endline survey for both phases will be analysed in Year 2 and 3. We will then work on producing a working paper and submit it to a peer-reviewed publication. In addition, we will daft policy briefs and disseminate results via meetings with VNP and stakeholders. All these activities should be completed by the end of the project.

Annex 2: Project's full current log frame as presented in the application form (unless changes have been agreed)

Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: The biodiversity of Virunga National Park is protected and people are thriving			
Outcome: An evidence-based innovative strategy decreases threats on natural habitats, protects biodiversity and decreases poverty in Virunga National Park. Results are scalable to other contexts	0.1 Beneficiaries of the job-market intervention saw their non-agricultural employment status improving three and six months after the start of the programme (salaried job and casual employment outside farming, disaggregation by gender. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator) 0.2 Poverty decrease among programs' participants three and six months after the start of the programme (multidimensional poverty including: reported non-agricultural incomes, food consumption) 0.3 Participation in the interventions decrease the demand for farmlands inside and outside the park (area farmed by beneficiaries, area farmed by the family of the beneficiary, area of farmlands owned by the beneficiary. Baseline will be measured during the pre-intervention survey. Effect measured through an Intent-to-Treat estimator)	0.1 to 0.3 Post-interventions surveys 0.4 Patrol and camera trap data 0.5 Record of publication and policy briefs	1.1 Participation in the programme will facilitate access to non-farming employment 1.2 Access to non-farming employment will contribute to poverty reduction 1.3 An increase in non-farming employment will decrease demand for farmlands inside and around VNP 1.4 Decreased demand for farmlands inside and around VNP will have a positive impact on the number of habitats

	0.4 Increase in wildlife observation in targeted areas of VNP one year after the end of the programme (diversity of species and abundance) 0.5 Lessons learnt are of interest for different audience, as measured by academic citations, attendance at specific events, audience of podcast and blogs (measured one and three years after the end of the programme)		
Outputs: **1**. The results of the pilot conducted in 2021 inform the design of the next phase of the RCT	1.1 Workshop with stakeholders (1 meeting with representatives of the civil society, entrepreneurs, parks' staff and project team) 1.2 Discussion with VNP top management (1 meeting)	1.1 Attendance record 1.2 Attendance record	1. Beneficiaries and stakeholders of the pilot are available to engage in the discussion with the team
2. Implementation of a RCT promoting access to off-farm jobs to decrease the loss of natural habitat in VNP	2.1 Eligible population are informed of a job-access programme (number of radio advertisements, number of posters in eligible villages) 2.2 600 (300 women) consented eligible participants benefit from a subsidized internship programme 2.3 600 (300 women) consented eligible participants benefit from a casual work intervention 2.4 600 (300 women) consented eligible participants are kept as controls	5.5 Register of applications submitted to participate to the programme 5.6 to 2.4 Programme registry	2. Enough people are interested in participating to an experimental job programme.
3. Monitoring of VNP's habitats and wildlife in the area of intervention	3.1 # Aerial census conducted around the areas targeted by the programme 3, 6 and 12 months after the start of the job programme	3.1 and 3.2. VNP's M&E team	3.1 Aerial census is conducted accordingly to the plan, despite numerous logistical constraints and insecurity

	3.2 # Satellite image analysis in the areas targeted by the programme 3, 6 and 12 months after the start of the job programme		3.2 Clouds-free satellite images are available
4. Quantitative impact evaluation of the RCT on people and nature	4.1 1800 baseline surveys are organised (a few weeks before the start of the intervention) 4.2 1800 midline surveys are organised (2.5 months after the start of the programme = in the last two weeks of the internship programme) 4.3 1800 endline surveys are organised (6 months after the start of the programme = 3 months after the end of the internship)	4.1 to 4.3 Raw data and survey instruments	4. Potential participants are willing to participate to a research-informed programme
5. Results are summarised and share for different audiences	5.1 A working paper summarising preliminary results is shared in open-access within 9 months of the end of the job programme 5.2 A paper is submitted for peer-reviewed publication within 12 months of the end of the job programme 5.3 Policy briefs in different formats summarising results within 12 months of the end of the job programme 5.4 Two meetings with VNP and stakeholders are organised to share the results.	5.1 Working paper 5.2 Peer-reviewed publication 5.3 Policy brief	

Activities

1.4 Organisation of a 1-day workshop with key stakeholders of the pilot (sample of beneficiaries, representatives of the civil society, sample of entrepreneurs, staff involved in the pilot).

1.5 Results of the workshop are shared and discussed with VNP senior management.

1.6 Results are synthetised in a brief document.

*

2.1The programme is advertised through local radio stations.

2.2 All applications are screened.

2.3 1800 eligible applications are randomly selected (by respecting gender equality) ; and randomly assigned to three groups: beneficiaries of the internship programme, beneficiaries of a casual work intervention, and control group.

2.4 1200 microenterprises are selected by phone among Virunga Energies clients, and randomly assigned to two treatment arms: those who will have an intern, control group.

2.5 The 600 interns (300 females) start the programme for a period of three months. They receive a monthly visit by a field staff.

2.6 The 600 beneficiaries of the casual work intervention (300 females) work on a non-agricultural project in the vicinity of their villages for up to 10 days.

*

3.1 Aerial census are conducted by Virunga staffs in the project areas to monitor encroachments

3.2 Satellite images are analysed by Virunga staffs in the project areas to monitor encroachments (Planet Basemap data and Sentinel 1)

3.3 Foot patrols and camera traps allow to estimate species presence and abundance

*

4.1 A baseline survey is organised when eligible people apply to the programme, prior to randomisation

4.2 A midline survey s organised with the 1800 participants three months after the start of the job-programme (corresponding for the intern to the final week of the internship).

4.3 A endline survey s organized with the 1800 participants six months after the start of the job-programme.

*

5.1 Data are analysed.

5.2 Results are summarised in a working paper and submitted to a peer-review journal.

5.3 Results are summarised in policy briefs.

5.4 Results are shared with VNP staffs and key stakeholders during two meetings after the midline and after the endline.

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A01	Number of people in eligible countries who have completed structured and relevant training	People	Men	90			90	303 (60 percent of men assigned to the job intervention arms, given current rates of take up and completion)
DI-A01	Number of people in eligible countries who have completed structured and relevant training	People	Women	50			50	195 (60 percent of women assigned to the job intervention arms, given current rates of take up and completion)
DI-BO9	Number of individuals/households reporting a decrease in unsustainable practices as a result of project activities	Number	Note: We propose to calculate this indicator as the number of individuals who reported a drop in the area of land cultivated relative to their baseline levels.	TBD (still waiting on data collection to be completed)				
DI-B10	Number of individuals/households reporting an adoption of livelihood improvement practices as a result of project activities	Number	We propose to calculate this indicator as the number of individuals who report an increase in non-agricultural employment relative to their baseline levels.	TBD (still waiting on data collection to be completed)				
DI-C18	Number of publications produced	Number		0				

DI Indicator number	Name of indicator	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-D09	Number of hectares where deforestation has been avoided through project support	Number	We propose to present the change in the number of hectares of farmland cultivated in the treatment group, relative to the control group.	TBD (still waiting on data collection to be completed)				

Table 2 Publications

We intend to list publications here in Year 3, given that Years 1&2 were largely a development and research phase.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	YES
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	YES
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	YES
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 16)?	N/A
Have you involved your partners in preparation of the report and named the main contributors	YES
Have you completed the Project Expenditure table fully?	YES
Do not include claim forms or other communications with this report.	