



NON-PERMANENCE RISK REPORT: REGENERATIVE AGRICULTURE IN RICE-WHEAT-MAIZE SYSTEM FOR INCOME GENERATION

by



Grow Indigo Private Limited

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1 INTERNAL RISK

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located.	0
b)	Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	0
c)	Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (i.e., any area of required experience is not covered by at least one individual with at least 5 years' experience in the area).	0
d)	Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	0
e)	Mitigation: Management team includes individuals with significant experience Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.	0
f)	Mitigation: Adaptive management plan in place	0
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		0
Total may be less than zero.		

Under project management the PP has given risk rating of 0 to species planted and Ongoing enforcement to prevent encroachment by outside actors as it is not applicable to the project. The knowledge partners supporting the project activities have demonstrable experience in modelling (quantification) and RS-GIS (monitoring). MoUs signed with the knowledge partners has been shared as evidence. Nevertheless, this project is the first of its kind that was listed in India; therefore, the PP is trying to be conservative to rate the risk: management team includes individuals with significant experience in AFOLU projects under the VCS Program or other approved GHG programs, as 0. The management team, especially the field team of Carbon vertical is present in the project area (considering all polygons of the project area) and the Grow

Indigo carbon vertical is in New Delhi. Therefore, **the risk rating is 0**. No mitigation has been applied for project management.

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Project cash flow breakeven point is greater than 10 years from the current risk assessment	0
b)	Project cash flow breakeven point is between 7 and up to less than 10 years from the current risk assessment	0
c)	Project cash flow breakeven point between 4 and up to less than 7 years from the current risk assessment	1
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment	0
e)	Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	0
f)	Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	0
g)	Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	0
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	0
i)	Mitigation: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven	-2
Total Financial Viability (FV) [as applicable,((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		0

The applicable financial viability risk categories are c) and h). The project cash flow breakeven point is between 4 and up to less than 7 years from the current risk assessment. Project started in 2019. First cash flow will happen in 2024 with issuance and subsequent sale of credits generated in the 1st monitoring period. Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven. Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven (Mitigation). The **risk is rated 0** as the risk factor does not apply to the project. A recently audited financial statement has been provided for verification.

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated	0
b)	NPV from the most profitable alternative land use activity is expected to be between 50% and up to 100% more than from project activities	0
c)	NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	0
d)	NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated	0
e)	NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	0
f)	NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	0
g)	Mitigation: Project proponent is a non-profit organization	0
h)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period (see project longevity)	-2
i)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years (see project longevity)	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		-2
Total may be less than 0.		

By incentivizing farmers to adopt regenerative agriculture practices and reduce GHG emissions, the project activities simultaneously improve soil health, climate resilience, and livelihoods, leading to net positive community impacts from the project activities. In the absence of the incentives provided by this project to encourage adoption of reduced tillage and direct seeding of rice, the most likely scenario is the continuation of conventional practices (baseline activities). This neither has any additional benefit to the farmers and other stakeholders involved, nor does provide the environmental benefits of this project's activities. ERR calculation sheet has been provided as

evidence for emission reduction. Additionally, there is no change in landuse (alternative landuse), therefore opportunity cost is not applicable for this project.

To substantiate the selection of option (d) refer VCS2590-Opportunity Cost NPV calculations document. Further we would like to clarify that we have a legal agreement with all participating farmers, which aligns with our project's longevity of 30 years. The agreement is specifically for 30 years, not 100 years, meaning our project is not legally bound to continue the management practices that protect credited carbon stocks for a period of at least 100 years. This is why we selected a score of zero for option (i), and -2 for option (h). Therefore, the score for project longevity (b), which reflects our 30-year legal agreement, does not contradict this selection.

Project Longevity		
a)	Without legal agreement or requirement to continue the management practice	0
b)	With legal agreement or requirement to continue the management practice	15
Total Project Longevity (PL) May not be less than zero		15

The legal Agreements have been signed with all participating farmers that have land rights. According to these agreements, the farmers are expected to continue the management practice for at least 30 years considering project longevity. Therefore, a risk rating of 15 is given as per the calculation: $30 - (PL/2)$.

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	15

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource access/use rights are held by same entity(s)	0

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
b)	Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession)	Not applicable
c)	In more than 5% of the project area, there exist disputes over land tenure or ownership	Not applicable
d)	There exist disputes over access/use rights (or overlapping rights)	Not applicable
e)	WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts	Not applicable
f)	Mitigation: Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period	Not applicable
g)	Mitigation: Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims	Not applicable
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)] Total may not be less than zero.		0

Justification for point (a and b): Farms covered under project area are under the ownership of the farmers. The resource access/use rights are held by these farmers, whereas PP operates a Carbon Program to boost these smallholder farmers' income through the adoption of regenerative agricultural practices, PP enters into legally binding agreements with the concerned farmer as per the law of land, which ensure the 75% of the net realization from carbon credit sales will be provide to the farmers. Therefore, the risk rating is 0. The land records and legal agreement signed between the PP and the farmer is provided as evidence to the VVB.

Justification for point (c and d): All the farmers with tenure over land included in the project have given their consent for the adopting regenerative practices over conventional agriculture practice. The land on which the project is implemented is crop land belonging to the project participating farmer enhancing the overall climate impact, this approach also secures economic benefits and positively contributes to livelihood of the smallholder farming community. Hence there is no

dispute exists over land tenure or ownership and access/uses rights.

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted	0
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	-5
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5
Total may be less than zero.		

Due to the movement restrictions imposed during the COVID-19 pandemic lockdown, less than 50% of the farmers (primary stakeholders) within the project area could be consulted. However, all participating farmers were included and consulted during data collection. As this is an ALM (Agriculture, Land Management) project, the farmers living within a 20 km radius outside the project boundary do not rely on the project area for essential resources like food, fuel, fodder, medicines, or building materials. Hence **it is considered as 0**.

The project has a net positive impact on the social and economic well-being of the local communities whose livelihoods depend on the project area. By encouraging farmers to adopt regenerative agriculture practices and reduce greenhouse gas (GHG) emissions, the project improves soil health, strengthens climate resilience, and enhances livelihoods. These actions lead to favourable environmental, social, and economic outcomes for the communities involved.

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Governance score of less than -0.79	0
b)	Governance score of -0.79 to less than -0.32	0
c)	Governance score of -0.32 to less than 0.19	0
d)	Governance score of 0.19 to less than 0.82	1
e)	Governance score of 0.82 or higher	0
f)	Mitigation: Country implementing REDD+ Readiness or other activities such as:	0

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
	a) The country is receiving REDD+ Readiness funding from the FCPF, UN-REDD or other bilateral or multilateral donors b) The country is participating in the CCBA/CARE REDD+ Social and Environmental Standards Initiative c) The jurisdiction in which the project is located is participating in the Governors' Climate and Forest Taskforce d) The country has an established national FSC or PEFC standards body e) The country has an established DNA under the CDM and has at least one registered CDM A/R project	
Total Political (PC) [as applicable ((a, b, c, d, or e) + f)] Total may not be less than zero.		1

A governance score was calculated from the mean of Governance Scores of the World Bank Institute's Worldwide Governance Indicators (WGI)¹, averaged over 2018-2022. According to the historical record of governance indicators (government effectiveness score) applied to India, the average score over the last five years (2018-2022) is 0.28. As the governance score² for India falls between 0.19 and 0.82, the risk rating for the same is 1. Thus, the **political risk applicable for this project is 1.**

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero.	0

3 NATURAL RISKS

Natural Risk (e.g., Fire, Pest and Disease outbreaks, Extreme Weather)	
Significance	Insignificant 1. Natural Risk: Fire The project area is centered on rice-wheat cropping systems, with no recent natural fire incidents from crop residue burning. While prohibitions were

¹The World Bank Institute Worldwide Governance Indicators are available at:
<http://info.worldbank.org/governance/wgi/index.asp>

Natural Risk (e.g., Fire, Pest and Disease outbreaks, Extreme Weather)

initially noted for Punjab, similar regulations cover Haryana and NCR regions.

The National Green Tribunal (NGT) issued an order on 10 December 2015 prohibiting agricultural residue burning across the NCT of Delhi, and the states of Rajasthan, Punjab, Uttar Pradesh, and Haryana, as referenced by the Press Information Bureau (<https://pib.gov.in/newsite/PrintRelease.aspx?relid=190615>).

Additionally, the Commission for Air Quality Management (CAQM) issued a framework on 10 June 2021, directing these regions to implement state-specific plans for controlling crop residue burning, with reinforcement on 16 September 2021 to ensure compliance <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1813181>.

The project adheres to these directives, fully complying with regional frameworks to minimize fire risks.

2. Natural Risk: Pest and Disease outbreaks

Pests and diseases do not significantly impact methane reductions from DSR or soil carbon sequestration with ZT:

DSR significantly reduces methane emissions compared to TPR due to the absence of continuous flooding. Methane is produced in anaerobic conditions, which are common in flooded fields, but DSR uses water-saving techniques which promote aerobic soil conditions that suppress methane production. This methane reduction is primarily controlled by the management of soil moisture, not by crop health or pest pressure. Even if pests or diseases affect crop yields, methane emissions are not influenced as they are unrelated to plant health but are instead linked to soil conditions.

Similarly, soil carbon sequestration under ZT is driven by minimal soil disturbance, conserving soil and water, and improving soil structure³. These processes are likely unaffected by pests and diseases that primarily impact above-ground biomass. Pests may reduce yields, but root biomass still contributes to soil carbon. Additionally, ZT improves soil structure and allows carbon sequestration to persist for "20 to 50 years". Thus, short-term pest and diseases are unlikely to disrupt the soil processes essential for long-term carbon sequestration in ZT systems.

3. Natural Risk: Extreme Weather (W)

Flooding events in the project area i.e., Punjab, Haryana, and NCR are short-term, infrequent, less severe, and non-recurrent events, and flood waters recede relatively faster, and flooded areas return to normal conditions. Floods of exceptional magnitude and discharge have occurred only a few times in a century in the Indo-Gangetic plains.⁴ The soil type is

³ Lal, R. (2004). Soil carbon sequestration impacts on global climate change and food security. *science*, 304(5677), 1623-1627.

⁴ https://www.iitk.ac.in/nicee/wcee/article/vol.3_session_1655.pdf accessed on 11 November 2023

Natural Risk (e.g., Fire, Pest and Disease outbreaks, Extreme Weather)	
	also well-drained and less susceptible to changes in soil carbon due to flooding. Moreover, floodwaters carry nutrients and sediments, which are deposited on flood plains, enriching the soil. Paddy farms are flooded deliberately to take advantage of this natural fertilization process.⁵ Punjab are 0.1-0.35 g⁶, 0.24 g⁷, and 0.059-0.091 g⁸ ranging from low to moderate, which only results in tremors and no potential damage to crops or soil carbon losses occur, and risk is rated as 0 (insignificant and no loss).⁹ 4. Natural Risk: Geological Risk Earthquakes do not have any direct impact on crops or soil carbon in the project area. The Peak ground acceleration (PGA) for the IGB varies from 0.06 to 0.54 g for 2% and 0.03 to 0.32 g for a 10% probability of exceedance in 50 years at bedrock condition.¹⁰ These probabilities represent the likelihood that the ground acceleration will exceed a certain value within a specific time frame, in this case, 50 years. This means that there is a 2% chance that the ground acceleration will exceed 0.06 g but not exceed 0.54 g within 50 years. The PGA for Haryana, Delhi NCR, and, and Punjab are 0.1-0.35 g¹¹, 0.24 g¹², and 0.059-0.091 g¹³ ranging from low to moderate, which only results in tremors and no potential damage to crops or soil carbon losses occur, and risk is rated as 0 (insignificant and no loss).¹⁴
Likelihood	It's not applicable to the project
Score (LS)	0
Mitigation	There is no mitigation measures involved.

Score for each natural risk applicable to the project (Determined by (LS × M))	
Fire (F)	0
Pest and Disease Outbreaks (PD)	0
Extreme Weather (W)	0
Geological Risk (G)	0

⁵ <https://www.floodmanagement.info/what-are-the-beneficial-impacts-of-floods> accessed on 11 November 2023

⁶ Puri, N., & Jain, A. (2019). Microzonation of seismic hazard for the state of Haryana, India. *Journal of the Geological Society of India*, 94, 297-308.

⁷ Iyengar, R. N., & Ghosh, S. (2004, August). Seismic hazard mapping of Delhi city. In *Proceedings of 13th world conference on earthquake engineering*. Vancouver, BC, Canada. Paper (No. 180).

⁸ Singh, P. et al. (2019). PGA studies for the specific sites of Bhatinda region (Punjab). *Journal of emerging technologies and emerging research*. Vol. 6 Issue 6

⁹ https://en.wikipedia.org/wiki/Peak_ground_acceleration accessed on 11 November 2023

¹⁰ Bajaj, K., & Anbazhagan, P. (2021). Detailed seismic hazard, disaggregation and sensitivity analysis for the Indo-Gangetic basin. *Pure and Applied Geophysics*, 178(6), 1977-1999.

¹¹ Puri, N., & Jain, A. (2019). Microzonation of seismic hazard for the state of Haryana, India. *Journal of the Geological Society of India*, 94, 297-308.

¹² Iyengar, R. N., & Ghosh, S. (2004, August). Seismic hazard mapping of Delhi city. In *Proceedings of 13th world conference on earthquake engineering*. Vancouver, BC, Canada. Paper (No. 180).

¹³ Singh, P. et al. (2019). PGA studies for the specific sites of Bhatinda region (Punjab). *Journal of emerging technologies and emerging research*. Vol. 6 Issue 6

¹⁴ https://en.wikipedia.org/wiki/Peak_ground_acceleration accessed on 11 November 2023

Score for each natural risk applicable to the project (Determined by (LS × M))	
Other natural risk (ON)	0
Total Natural Risk (as applicable, F + PD + W + G + ON)	0

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	13
External Risk	0
Natural Risk	0
Overall Risk Rating (a + b + c)	13

4.2 Calculation of Total VCU

Year	Reductions (tCO ₂ e)	Removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Uncertainty deductions (tCO ₂ e)	Net GHG emission reductions and removals (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	VCUs eligible for Issuance* (tCO ₂ e)
06-May-2019 --31-December-2019	1,119.81	8,040.89	0.00	556.75	9,160.70	1,045.32	8,115.39
01-January-2020--31-December-2020	5,595.70	13,284.46	0.00	1,325.76	18,880.16	1,726.98	17,153.18
01-January-2021--31-December-2021	12,245.67	9,621.68	0.00	1,577.62	21,867.34	1,250.82	20,616.53
01-January-2022--31-May-2022	7,769.78	4,378.11	0.00	808.61	12,147.89	569.15	11,578.73
Total	26,730.96	35,325.14	0.00	4,268.74	62,056.09	4,592.27	57,463.83

*Calculated as per equation 53 of VM0042 v1