GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title	
Strengthening Yemen's National Biosafety Framework for Safe Management of Biotechnology	
Region Asia	GEF Project ID 12260
Country(ies) Yemen	Type of Project MSP
GEF Agency(ies): UNDP	GEF Agency ID 10419
Executing Partner TBD	Executing Partner Type
GEF Focal Area (s) Biodiversity	Submission Date 12/22/2025
Project Sector (CCM Only)	

Taxonomy

Influencing models, Transform policy and regulatory environments, Demonstrate innovative approache, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Stakeholders, Private Sector, Large corporations, SMEs, Individuals/Entrepreneurs, Beneficiaries, Local Communities, Civil Society, Academia, Non-Governmental Organization, Community Based Organization, Type of Engagement, Information Dissemination, Partnership, Consultation, Participation, Communications, Awareness Raising, Public Campaigns, Education, Behavior change, Capacity, Knowledge and Research, Enabling Activities, Capacity Development, Innovation, Learning, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Women groups, Gender results areas, Participation and leadership, Knowledge Generation and Exchange, Focal Areas, Biodiversity, Mainstreaming, Agriculture and agrobiodiversity, Species, Plant Genetic Resources, Animal Genetic Resources, Supplementary Protocol to the CBD, Biosafety

Type of Trust Fund GET	Project Duration (Months) 36
GEF Project Grant: (a) 1,007,867.00	GEF Project Non-Grant: (b) 0.00
Agency Fee(s) Grant: (c) 95,747.00	Agency Fee(s) Non-Grant (d) 0.00
Total GEF Financing: (a+b+c+d) 1,103,614.00	Total Co-financing 3,850,000.00
PPG Amount: (e) 50,000.00	PPG Agency Fee(s): (f) 4,750.00

PPG total amount: (e+f)	Total GEF Resources: (a+b+c+d+e+f)
54,750.00	1,158,364.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No Competitive Window: No

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. The explanation and justification of the project should be in section B “project description”.(max. 250 words, approximately 1/2 page)

Yemen is a Party to the Cartagena Protocol on Biosafety (CPB) but lacks an operational National Biosafety Framework (NBF). The draft biosafety regulations remain unenacted; no functional risk-assessment or testing system exists; border controls are ad-hoc; and public awareness is low. In a fragile and conflict context, these gaps prevent Yemen from safely managing Living Modified Organisms (LMOs) and complying with CPB requirements. The project objective is to operationalize Yemen’s National Biosafety Framework through legal adoption, institutional capacity building, risk assessment infrastructure, and public awareness, ensuring compliance with the Cartagena Protocol. To achieve the Objective the project will apply three strategies: (i) National Biosafety policy, legal and operational framework; (ii) National capacity for biosafety risk assessment, testing and enforcement; (iii) Biosafety awareness, stakeholder engagement, and knowledge management. By project end, Yemen will have an adopted biosafety legal framework (biosafety by-laws, regulations and guidelines in force); an empowered National Biosafety Committee (formally re-established, ≥30% women) and an inter-agency mechanism; an operational national biosafety lab (with ≥4 trained staff); risk-based border control (≥100 Customs/Quarantine/Port Health officers trained (≥30% women)); and informed, participatory decision-making (SRAC of 10–12 members (≥30% women), ≥800 biosafety dialogue participants (≥40% women, ≥30% youth); ≥200,000 people reached by biosafety awareness campaign); +25% increase in biosafety understanding among target audience), with a clear sustainability pathway (Resource Mobilization & Sustainability Plan adopted by MWE) to sustain operations and CPB compliance.

Indicative Project Overview

Project Objective

To operationalize Yemen’s National Biosafety Framework through legal adoption, institutional capacity building, risk assessment infrastructure, and public awareness, ensuring compliance with the Cartagena Protocol

Project Components

1. Biosafety Policy, Legal, and Institutional Strengthening

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
150,000.00	572,992.00

Outcome:

1. Operational National Biosafety legal and institutional framework, enabling enforcement of biosafety measures in line with the Cartagena Protocol, *as indicated by:*

Biosafety regulations, guidelines, and SOPs adopted by the Government and implemented (5-6 instruments total);

National Biosafety Committee formally reestablished by ministerial order (30% of members are women);

Inter-agency Biosafety Coordination Mechanism

Established via MoU with joint SOP for border referrals (30% of members are women);

National Biosafety Clearing House *(BCH) node operational with at least 30 national records uploaded (registration, NBF, decisions, focal points, risk assessment summaries)*

Output:

1.1. Implementing biosafety regulations, guidelines, and standard operating procedures (SOPs) developed and submitted for Government adoption;

1.2. National Biosafety Committee (NBC) reactivated with updated membership, terms of reference, and operational budget plan;

1.3. Biosafety Inter-agency coordination mechanism developed and formalized between EPA, Agriculture, Health, Customs, Standards Authority, and academia;

1.4. National Biosafety Clearing House (BCH) upgraded and linked to global BCH, with regular data updates;

2. Capacity Building for Biosafety Risk Assessment, Monitoring, and Enforcement

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
640,200.00	2,429,488.00

Outcome:

2.Strengthened national biosafety capacity for scientific risk assessment, decision-making on LMOs, border control, and monitoring, *as indicated by:*

SRAC established by ministerial order with 10-12 members (30% are women);

National GMO detection laboratory established, equipped, and have at least 4 of trained staff;

>= 100 officers of Customs, Quarantine, Port Health (30% women) across priority ports/airports/land borders have sufficient skills to detect and control GMO

Output:

2.1. Scientific Risk Assessment Committee (SRAC) established and trained in GMO risk assessment, detection, and management

2.2. National GMO detection laboratory equipped and operationalized (Polymerase Chain Reaction PCR-based), with trained technicians

2.3. Customs and Quarantine officer trained on biosafety inspection, documentation verification, and GMO sampling and equipped with portable GMO detection kits

3. Public Awareness, Stakeholder Engagement, and Knowledge Management

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
80,243.00	306,524.00

Outcome:

3. Increased public understanding and stakeholder participation in biosafety decision making, *as indicated by:*

≥800 direct participants in biosafety dialogues/town-halls/workshops (≥40% women; ≥30% youth);

≥200,000 people reached via radio/social media/print/

WhatsApp campaign

>=25% increase in correct answers on basic biosafety/CPB questions by the end of the project;

>= 1,000 direct and 200,000 indirect project beneficiaries (>=40% women)

Biosafety Resource Mobilization and Sustainability plan is adopted by Ministry of Water and Environment (MWE)

Output:

3.1. National biosafety awareness campaign launched, and multi-stakeholder dialogues conducted on GMO issues, involving farmers, industry, NGOs, and consumer associations;

3.2. Project knowledge products, including Biosafety Resource Mobilization and Sustainability plan, uploaded to Biosafety Clearing House (BCH) and shared with Arab Region biosafety network

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
45,800.00	190,996.00

Outcome:

4. M&E, *as indicated by:*

- satisfactory rating of the project Quality Assurance supported by TE;

Output:

4.1. Participatory, inclusive, and gender-responsive M&E system is implemented to measure the project effectiveness, and support Adaptive Management

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
1. Biosafety Policy, Legal, and Institutional Strengthening	150,000.00	572,992.00
2. Capacity Building for Biosafety Risk Assessment, Monitoring, and Enforcement	640,200.00	2,429,488.00
3. Public Awareness, Stakeholder Engagement, and Knowledge Management	80,243.00	306,524.00

M&E	45,800.00	190,996.00
Subtotal	**916,243.00**	**3,500,000.00**
Project Management Cost	91,624.00	350,000.00
Total Project Cost ($)	**1,007,867.00**	**3,850,000.00**

Please provide justification

PROJECT OUTLINE

A. PROJECT RATIONALE

Briefly describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

Yemen's biodiversity has global significance because it spans a rare convergence of globally important terrestrial and marine ecosystems: from montane habitats and Arabian woodlands to Red Sea and Gulf of Aden coastal and marine systems (coral reefs, seagrass beds, mangroves), creating high habitat heterogeneity and concentrations of range-restricted species across multiple taxa. National biodiversity sources report approximately 2,836 plant species (1,065 genera; 179 families), including about 604 endemic and near-endemic plants, alongside at least 71 terrestrial mammal species, 103 reptile species, and 8 amphibian species recorded nationally[1][1]. Yemen also contains 70 Key Biodiversity Areas (KBAs) identified as globally important sites for biodiversity[2][2].

Yemen has been a Party to the Cartagena Protocol on Biosafety (CPB) since 2006, but implementing a functional national biosafety framework over the past decade has been fraught with challenges[3][3]. The National Biosafety Framework (NBF) developed in 2005 with UNEP/GEF project support outlined Yemen's plans for biosafety legislation, administrative systems, and capacity building[4][4]. In early 2005 the Yemeni Parliament approved the NBF legislation which was modeled on the EU's approach (emphasizing GMO labeling), but it stalled awaiting Presidential ratification[5][5]. Since 2015, the escalation of armed conflict and political instability have severely constrained governance and resources, hindering biosafety implementation[6][6]. Thus, Yemen faces a multitude of interlinked challenges in implementing its National Biosafety Framework. The legal vacuum, institutional fragility, lack of resources, and war-time conditions have all contributed to the stagnation of biosafety efforts from 2015 to 2025.

Without a functional National Biosafety Framework, Yemen cannot reliably assess, authorize, or monitor living modified organisms (LMOs), leaving regulators unable to prevent unsafe imports, accidental releases, or misuse, especially at borders where documentation checks, sampling, and chain-of-custody are weak. This creates tangible biosecurity and public-health risks, potential ecosystem and agrobiodiversity harm (e.g., gene flow to local crops, invasive traits), and legal exposure from incidents without clear liability, response, or transparency procedures. It also undermines Cartagena Protocol compliance (risk assessment,

risk management, BCH information-sharing, public participation), eroding international confidence, restricting market access for food and agricultural trade that requires biosafety assurances, and jeopardizing donor financing for biotechnology, agriculture, and food security operations. Domestically, the vacuum fuels policy incoherence across Environment, Agriculture, Health, Customs, and Standards agencies, weakens evidence-based decision-making, and diminishes public trust, while Yemen forfeits positive benefits of safe biotechnology (e.g., validated testing services, research collaboration, and targeted innovation) that could support food systems and resilience.

Direct Threat to Biodiversity: Lack of biosafety framework can accelerate biodiversity loss by weakening the country's ability to prevent and manage biodiversity pressures that are already acute under conflict conditions. In practical terms, weak or unenforced biosafety rules increase the probability of unassessed LMO/GMO entry, release, or use, which can interact with major drivers of biodiversity loss, especially habitat degradation and overexploitation (through agricultural expansion and livelihood stress), invasive species pressures, and climate-related stressors by increasing ecological uncertainty and adding new biological risks (e.g., unintended gene flow into local landraces, emergence of hard-to-manage traits, and downstream impacts on associated species and ecosystem functions). UNEP highlights that Yemen's biodiversity is already under pressure from unplanned development, resource exploitation, invasive species, and climate change, while Yemen's CBD reporting describes accelerating biodiversity loss under war-related pressures, including intensified extraction and institutional constraints - conditions that make prevention, monitoring, and rapid response even more critical[7][7].

On the positive side, Yemen has identified biosafety implementation gaps clearly in its national reports and strategies, acknowledging the *"limited… capacity"*, *"nonoperational framework"*, and need for improvement in coordination and awareness[8][8]. This honest appraisal is the first step. Going forward, addressing these weaknesses will require concerted action: passing the biosafety regulations, rebuilding institutional capacity, establishing at least minimal lab and monitoring capabilities, and integrating biosafety into the broader recovery and development agenda. International organizations (CBD Secretariat, UNDP, UNEP, GEF, FAO, etc.) and regional partners have a significant role to play in helping Yemen close these gaps. For now, the country's biosafety framework implementation remains largely aspirational, with critical gaps to be filled for full compliance and effective protection of biodiversity and human health from potential biotech risks.

Future scenarios for Yemen that can influence National Biosafety Efforts

Based on the analysis of the situation in Yemen the following four simple future scenarios were considered for this GEF project[9][9]:

Scenario 1. Negotiated Stabilization & Reopening (Probability≈30%). A fragile national accommodation holds, major front lines quiet, and a basic economic normalization begins. Key ports and corridors (Aden, Mokha, Hodeidah under monitoring) operate more predictably; fuel and food imports stabilize; inflation eases though remains high. Donors scale up recovery programs; line ministries regain minimal functionality; reliable electric power is still scarce but improves in urban hubs via mixed grids and generators. Private logistics and telecoms expand, enabling more routine movement of goods, officials, and data. Rule-of-law remains uneven, but administrative processes (permits, inspections, and routine public services) become possible again, especially in coastal cities.

Scenario 2. Local Compacts, Patchwork Access (Probability≈35%). No national settlement emerges, but durable local arrangements reduce violence in key districts. Mobility depends on corridor-by-corridor deals; some governorates enjoy steady market access while others face intermittent closures. Aid and commerce thread through a mosaic of authorities, checkpoints, and fees; traders adapt with multi-leg routes via Oman and the Horn of Africa. Urban service delivery (water, waste, clinics) improves unevenly; data connectivity is fair in cities, poor in rural uplands. Civil society and universities operate where space permits. This patchwork allows steady (if unpredictable) operational windows, with sudden shocks from localized flare-ups or corridor renegotiations.

Scenario 3. Protracted Fragmentation & Isolation (Probability≈20%). Conflict cycles persist and external constraints tighten. Major ports face periodic shutdowns or severe throughput limits; insurance and freight costs soar; the Rial depreciates sharply, driving food and fuel crises. Large-scale displacement continues; power outages become the norm outside a few enclaves; ministries hollow out further, with most services NGO- or community-run. Market surveillance and border oversight are minimal; informal trade grows but is volatile. International programming focuses on life-saving assistance; movement permissions are restrictive and unpredictable. Any nationwide initiative must contend with long pauses, limited access, and high transaction costs.

Scenario 4. Climate-Shock Supercycle amid Partial Calm (Probability≈15%). Even with relative security improvements, a run of extreme events, such as cyclones, flooding, heatwaves, multi-season drought, and crop pests repeatedly disrupts supply chains and governance bandwidth. Ports and roads suffer episodic damage; emergency imports spike; health systems battle water-borne disease and heat stress. Food systems swing between failed harvests and import dependence; remittances cushion but don't offset price spikes. Authorities and aid actors pivot into near-continuous disaster response, prioritizing early warning, public health, and resilient basic services. Recovery windows appear, but are short, forcing lean, shock-tolerant operations and heavy reliance on radio/WhatsApp communication.

Yemen's National Biosafety Framework can stay useful across all four future scenarios by running in flexible modes with clear triggers (corridor access, lab uptime, disaster load, parliamentary windows). In calmer periods it can operate full but frugal with parliamentary adoption, national committees, tiered border referrals, and a central PCR lab with regional twinning. In patchwork settings it can decentralize to corridor hubs with portable screening, hub-and-spoke sampling, executive regulations, and Short Message Service/ Unstructured Supplementary Service Data (SMS/USSD) reporting. Under prolonged fragmentation it can preserve minimum viable compliance validated but pending legal texts, lean sign-off authority, documentary checks with targeted screens, periodic staff drills, and a small O&M budget. During climate shocks it can shift to surge-and-shield mode: mobile testing, pooled samples, go-bags and backup power, pre-approved emergency decisions, and rapid risk communication. Across all scenarios NBF can keep capability alive and ready to scale. So, building Yemen's NBF as a lean and modular structure represents a classic no-regret investment: it delivers value across different future scenarios.

Transformative Paradigm Shift: A functional NBF in Yemen will enable a genuine paradigm shift by replacing ad-hoc, personality-driven approvals with a transparent, rules-based system anchored in law, gender-balanced institutions, and risk-proportionate SOPs. It will mainstream biosafety into the country's plant, food, and public health regulatory foundation, so decisions, border triage, and laboratory confirmation become routine public functions rather than one-off projects. Offline-capable data flows and clear grievance and rumor management protocols will build public trust and accountability, while fee-for-service testing, regional twinning, and lean O&M will keep the system financially and operationally durable. This combination will lower transaction costs for safe trade and humanitarian imports, protect biodiversity and health, and create predictable signals that crowd-in cooperation from universities, inspectors, and the private sector. In short, a functional NBF will becomes a no-regret, shock-tolerant backbone that sustains compliance today and unlocks scalable, locally owned improvements tomorrow even amid fragility.

Baseline Programs in Yemen to establish functional National Biosafety Framework

Yemen's national biosafety policy is rooted in its 2005 National Biosafety Framework, which laid out a **draft Biosafety Law** (often referred to as a "by-law" in national documents) along with guidelines for handling living modified organisms (LMOs)[10][10]. The country formally acceded to the Cartagena Protocol on Biosafety (CPB) in 2005 via Presidential Decree No. 64/2005[11][11], reflecting high-level commitment to safe handling of GMOs. However, Yemen has not enacted a dedicated biosafety law to date. The draft law approved by Parliament in 2005 never fully entered into force due to subsequent political turmoil[12][12]. As of 2025, the NBF remains *"nonoperational"*, with *"lack of a national Biosafety by-law"* and *"inadequate legislations to regulate the use and release of living modified organisms"* ***[13]***[13] . In practice, this means there are no binding national regulations or standards specifically governing GMOs/LMOs, no explicit requirements for risk assessment prior to import or release, no enforceable labeling rules, and no formal mechanisms for approval or rejection of biotech applications. General environment and agriculture laws do not fill this gap. For example, Yemen's environmental protection law and plant quarantine regulations provide broad mandates but do not address modern biotechnology explicitly.

Yemen's policy statements have nonetheless echoed CPB principles. The Cartagena Protocol's focus on transboundary movement and precaution is acknowledged in national strategy documents[14][14]. Notably, Yemen's draft biosafety regulation provided for

consideration of socio-economic impacts alongside scientific risk assessments in decision-making[15], consistent with CPB Article 26 which allows socio-economic considerations. The draft was also aligned with CPB provisions on labeling and identification: it required heavy labeling of GMO shipments, mirroring stringent EU standards[16]. These alignments on paper indicate that Yemen's intended framework did not diverge from the Protocol's objectives, it was even more comprehensive in some respects (e.g. mandatory labeling of all GMO products). The major divergence, however, lies in implementation. The absence of enacted regulations means Yemen has not met core CPB obligations domestically, such as establishing an operative *advance informed agreement* procedure for GMO imports or a risk assessment system, despite being a Party. In summary, Yemen has the blueprint of a biosafety regime but lacks the legal force and updated policies to carry it out.

Despite the legal gaps, Yemen did establish an institutional architecture for biosafety, centering on a multi-agency **National Biosafety Committee (NBC)** and various competent authorities. Thus, In Yemen's National Biosafety Framework, the **Environment Protection Authority (EPA)** is the competent authority and secretariat responsible for the biosafety law and regulations, convening the National Biosafety Committee (NBC), administering the Biosafety Clearing House (BCH), and coordinating risk assessment/management. The **Ministry of Agriculture, Irrigation and Fisheries** through Plant Protection & Quarantine handles seeds/plant materials, border inspections, and referrals for testing; the **Ministry of Public Health & Population** covers food/health aspects and laboratory biosafety; the **Yemen Standardization, Metrology & Quality Control Organization (YSMO)** develops and enforces product/labeling standards for LMO-containing goods; and the **Customs Authority** conducts frontline document checks, sampling, and chain-of-custody to the lab. Universities and research institutes supply experts to a **Scientific Risk Assessment Committee** and host technical trainings. However, current capacity of all agencies is **very limited**: the biosafety by-laws, regulations, and guidelines remains unadopted; the NBC and scientific committee are largely dormant; EPA's biosafety unit is under-staffed and under-resourced; quarantine and customs lack validated SOPs, routine training, and rapid tests; public health and agricultural labs have minimal GMO testing capability; and the national BCH is outdated with few records. Persistent budget constraints, staff turnover, weak inter-agency data sharing, and conflict-related logistics further erode performance leaving Yemen with fragmented oversight and little operational ability to assess LMOs, enforce decisions at borders, or inform the public.

Over the past ten years, Yemen's on-the-ground biosafety initiatives have been modest, often driven by international assistance rather than domestic programs. Key initiatives include:

- **UNEP-GEF Capacity Building Projects:** Yemen benefited from several global projects funded by the Global Environment Facility (GEF) and implemented by UNEP to sustain minimum biosafety capacity. Notably, Yemen participated in a UNEP-GEF project to establish and operationalize its national Biosafety Clearing House (BCH) node around 2014[17]. This aimed to enhance data exchange and ensure Yemen could share information via the BCH as required by the CPB. In the late 2010s, Yemen also joined multi-country projects to prepare National Biosafety Reports. For example, from 2015–2019 Yemen was part of a GEF-funded effort to draft the Third National Report on CPB implementation[18], and similarly in 2020–2023 for the Fourth National Report[19]. Through these projects, international experts assisted Yemen's EPA in compiling information on its biosafety status for submission to the CPB Secretariat. While these reporting projects did not implement biosafety on the ground, they at least kept Yemen engaged in the global biosafety process and identified gaps to address.
- **Previous NBF Development Efforts:** Just prior to the 2015–2025 period, Yemen had undertaken NBF foundational activities. The original UNEP-GEF National Biosafety Framework Development Project (early 2000s) produced the 2005 NBF document[20]. That project involved stakeholder workshops, training of a few officials, and drafting of guidelines and a law. Many of Yemen's current senior biosafety stakeholders received their initial training during that period. Additionally, around 2010–2012 Yemen was included in a BCH Phase II – Sustainable Participation in the BCH global project, which provided IT hardware and training to maintain a national BCH website[21]. By 2013, Yemen had a

rudimentary BCH webpage (under the CBD's platform) and a designated BCH focal point. Unfortunately, the outbreak of civil war in 2014/15 meant these gains could not be sustained, national data sharing halted and the BCH node became inactive (no regular updates).

- **Regional Biosafety/Biotech Cooperation:** Yemen has engaged sporadically in regional biosafety initiatives. One example is an FAO-led project on a Regional GMO Detection Platform in the Near East. In a 2011 FAO assessment, Yemeni labs were evaluated for GMO detection capacity and needs[22][22]. Yemeni officials attended regional workshops under this initiative to learn about GMO testing and to network with better equipped labs in neighboring countries. However, Yemen did not receive significant laboratory equipment through this project, and the war later isolated its scientists from sustained regional cooperation. There has also been cooperation with international agricultural research centers: for instance, the Agricultural Research and Extension Authority (AREA) in Dhamar partnered with ICARDA (International Center for Agricultural Research in the Dry Areas) to establish a biotechnology lab in the mid-2000s[23][23]. By 2015, that lab existed but was underutilized due to funding and staffing issues. No new biotechnology research projects have been reported during the war years.
- **Public Awareness and Education Programs:** Public engagement activities have been minimal. In the early NBF project, some awareness workshops and brochures on GMOs were produced (circa 2004–2006). During 2015–2025, given the conflict, there have been *no large-scale biosafety outreach campaigns*. Environmental NGOs in Yemen have focused on humanitarian and basic environmental health issues rather than biotechnology. The NBSAP (2015) did include actions for biosafety education and integrating biosafety into conservation programs, but implementation was essentially zero (the Sixth National Report noted that less than 1% of planned biosafety measures were realized)[24][24]. One small effort was integrating biosafety topics into academic curricula: Sana'a University's Faculty of Science introduced a few lectures on biotechnology risks in its biology courses, under guidance from NBC members. Overall, however, public awareness remains extremely low – as of 2020, *"the awareness level is low and presently no authority has been assigned to… monitor safe utilization of GMOs"*, highlighting the dearth of outreach and oversight[25][25].

In summary, concrete biosafety initiatives in Yemen over the last decade have largely been confined to maintaining a nominal presence in international programs (BCH, reporting) and protecting earlier gains from complete collapse. No significant new national biosafety projects or investments were launched by the Yemeni government itself, as national priorities shifted to emergency needs. The ongoing humanitarian crisis siphoned attention and resources away from biosafety, leaving implementation efforts largely *"on hold"*. Also, Yemen's enforcement of biosafety is extremely weak. The country relies on the general precaution of not engaging with GMOs at all, rather than actively managing risks. This is a major compliance gap: key CPB requirements like border controls for LMOs (Art. 18) and monitoring of any effects (Art. 16) are not being met in practice.

Barriers for effective implementation of the National Biosafety Framework

Despite some national progress to implement Living Modified Organism Biosafety Management (LBM) concept in Yemen there are a few barriers that impede the effective integration of LBM in the country's area-based conservation measures. The barriers are the following:

Barrier 1: *Lack of NBF policy and legislation and nonfunctional law enforcement, coordination and inter-agency mechanisms.*

The foremost weakness is the absence of an enforced biosafety law and regulations. Yemen's NBF has never been translated into binding rules. This legislative void means no formal requirements or procedures are in place for biosafety – creating uncertainty and leaving Yemen without legal powers to control GMO activities. A standalone biosafety law is almost impossible to enact by the Government in the current political situation. Even if laws existed, enforcement mechanisms are weak or nonexistent. No agency currently has a clear mandate or the means to enforce biosafety compliance (as noted, no evidence of an enforcement agency for biosecurity/biosafety)[26][26]. Customs and port authorities are not empowered or instructed to hold GMO shipments. There is no monitoring program in fields or markets to check for unauthorized GM seeds or products. The lack of any incidents so far is more

due to low usage of biotechnology than due to effective control. This poses a latent risk: if, for example, farmers unknowingly plant imported GM seeds, Yemen might not detect it or respond in time. Strengthening enforcement will require assigning clear responsibilities (perhaps a biosafety inspectorate within EPA or Agriculture) and giving them training and authority.

Although the National Biosafety Committee (NBC) brings multiple agencies together, effective coordination remains a weakness. Different ministries have many pressing priorities, and biosafety tends to fall between the cracks. There have been overlaps or uncertainties: for example, should a GMO food safety issue be handled by the Health ministry or the EPA? The NBF tried to delineate this, but with agencies barely meeting, such questions are unresolved. The absence of a sustained national biosafety coordination office (a fully staffed secretariat) means follow-through on any biosafety issue is poor. Intra-government communication is strained by the split of authority between the internationally recognized government and de facto authorities further complicates coordination. There may now be parallel structures (e.g., an EPA in Aden and one in Sana'a), which makes a unified biosafety approach difficult. Political fragmentation is thus a significant institutional challenge.

Barrier 2: *Low institutional capacity for biosafety risk assessment, monitoring, and enforcement.*

Yemen's institutions have extremely limited technical and administrative capacity for biosafety. The EPA's environment authority, which leads biosafety, is under-resourced and overstretched. Its staff have not received advanced training in risk assessment or biosafety regulation (some training occurred pre-2010, but many trained staff may have since left the country or sector). Key ministries (Agriculture, Health, etc.) similarly face a shortage of personnel with expertise in biotechnology. An indicator of this gap is that Yemen has "limited institutional capacity… attributable to limited financial resources, equipment, expertise" in both the EPA biosafety unit and quarantine services[27][27]. Essentially, capacity building efforts have not kept pace with needs: the war halted most capacity development programs. Yemen will need significant training programs for regulators, inspectors, lab technicians, and scientists to rebuild human capacity. There is a glaring lack of infrastructure for biosafety, especially laboratory facilities to detect and monitor GMOs. Yemen does not have a dedicated GMO testing lab (PCR testing for GMO traces, for example, is not routinely done). Basic lab infrastructure in Yemen has suffered from war damage, maintenance issues, and resource cuts. The country's only marginally relevant facility – the biotech lab in Dhamar – lacks reagents and regular electricity to function reliably. Without lab capacity, risk monitoring and enforcement remain theoretical. Additionally, quarantine stations lack proper equipment (scanners, test kits) to screen imports. Establishing or refurbishing at least one central biotech lab (and equipping ports with rapid test kits) is a critical need moving forward.

Additionally, Yemen's biosafety efforts have relied almost entirely on external funding (GEF projects, FAO, UNEP support). Domestic budget allocation for biosafety is nearly zero. Even during the NBF development, most funding came via a UNEP-GEF grant. In the current fiscal crisis, expecting national funds for biosafety is unrealistic. This means continued international support is critical, yet securing funding is challenging as donors prioritize life-saving aid in Yemen. The small GEF enabling projects are helpful but not sufficient for building a full biosafety system. A larger capacity building project is needed to fill gaps in training, legal reform, and infrastructure.

Barrier 3: *Low public awareness, knowledge and engagement in the national biosafety issues.*

A major challenge is the **low level of public and stakeholder engagement** on biosafety. The concept of biosafety is not well-known outside a small circle of officials and academics. This means there is little public demand or pressure for implementing biosafety measures; the issue doesn't rank in political or civil society agendas. It also means that if and when Yemen needs to make decisions on GMOs (for instance, approving a drought-tolerant GM crop in the future), the public discourse might be driven by fear or misinformation. The Sixth CBD Report emphasizes the need to enhance public awareness. Overcoming this will require education campaigns, integration of biosafety into academic curricula, and involvement of NGOs or media to inform the public.

Key strategies to remove the Barriers for NBF implementation

To effectively address the barriers to NBF in Yemen in the current situation, the following key strategies should be implemented:

- **Legal & governance enablement**. Given a standalone National Biosafety Law is not realistic for establishing now, the country should update and implement executive regulations and ministerial guidelines under the existing NBF and other relevant laws to control LMOs; reactivate the NBC and constitute a Scientific Risk Assessment Committee to issue opinions. Formalize an inter-agency MoU

with joint SOPs, assign clear enforcement authority (inspections, sampling, sanctions), and publish non-confidential decisions to the BCH to ensure transparency despite institutional fragmentation;

- **Operational capacity and infrastructure.** Commission a GMO detection lab with validated screening/event assays and a reference-lab MoU; train core analysts and regulators. Equip borders with sampling kits and rapid screens, train Customs/Quarantine/Port Health officers, and run drills to make enforcement real; ensure NBF funding;

- **Public awareness and participation**. Deliver a national, multi-channel campaign plus targeted town-halls/sector workshops and a journalists' meetings to counter misinformation and explain procedures.

Key Stakeholders for Implementation of NBF strategies

Successful implementation of Yemen's National Biosafety Framework (NBF) depends on coordinated action across government regulators: the Environment Protection Authority (EPA) as competent authority and NBC secretariat; the Ministry of Agriculture & Irrigation/Plant Protection & Quarantine (seeds/plant materials, border inspections); the Ministry of Public Health & Population (food/health risk); the Yemen Standardization, Metrology & Quality Control Organization (YSMO) (standards/labeling); and the Customs Authority (documentation checks, sampling, chain-of-custody) working alongside the National Biosafety Committee (NBC), Scientific Risk Assessment Committee (SRAC), and universities/research labs that supply risk-assessment expertise and testing capacity. Private sector actors (seed and feed importers, food processors/retailers, logistics/brokers, accredited labs), farmer organizations, consumer associations, NGOs, and media are essential for compliance, public participation, and transparent information flows to the Biosafety Clearing House (BCH). International and regional partners—UNDP, UNEP/CBD (CPB & BCH), FAO, WHO, and PERSGA can provide policy guidance, training, and co-financing. Under an NBC-led coordination mechanism (inter-agency MoU and joint SOPs), these stakeholders can align policy, risk assessment, border enforcement, and outreach to operationalize the NBF, strengthen biosecurity, and ensure sustained Cartagena Protocol compliance. See details in the section B: Project Description.

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B. PROJECT DESCRIPTION

Project description

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the PIF guidance document. (Approximately 3-5 pages) see guidance here

Based on the situation analysis and set of potential strategies provided in the Project Rationale section above, the following GEF project is being proposed to address the three Barriers for implementation National Biosafety Framework in Yemen (the project **Theory of Change** is depicted on the Fig. 1 and described below):

The **Project Objective** is: *To operationalize Yemen's National Biosafety Framework through legal adoption, institutional capacity building, risk assessment infrastructure, and public awareness, ensuring compliance with the Cartagena Protocol*

The Project Objective is expected to be achieved through implementation of the three project Strategies (**Components**), designed to remove the **Barriers 1-3** and achieve the project **Outcomes** (systematic and transformative changes in the National Biosafety Framework implementation). The strategies have been suggested based on the lessons learned from other GEF and non-GEF projects related to biosafety in Yemen and other countries (see the section *Lessons Learned from Previous NBF Initiatives* below) to ensure their effectiveness. The suggested strategies (components) are based on the **GEF8 Levers** and will work in synergy with each other to establish functional NBF in Yemen. Thus, the project Components are the following:

- **Component 1.** *Biosafety Policy, Legal, and Institutional Strengthening*;

- **Component 2.** *Capacity Building for Biosafety Risk Assessment, Monitoring, and Enforcement;*
- **Component 3.** *Public Awareness, Stakeholder Engagement, and Knowledge Management*.

Implementation of the project Components will be accompanied by participatory and gender-responsive **Monitoring and Evaluation system** to track project effectiveness, and support project adaptive management.

Thus, **Component 1** is designed to remove **Barrier 1:** *Lack of NBF policy and legislation and nonfunctional law enforcement, coordination and inter-agency mechanisms* and achieve the **Outcome 1:** *Operational National Biosafety legal and institutional framework, enabling enforcement of biosafety measures in line with the Cartagena Protocol.* Outcome 1 is expected to be achieved through delivery of four project **Outputs** (direct project products and services):

- **Output 1.1.** Implementing biosafety regulations, guidelines, and standard operating procedures (SOPs) developed and submitted for Government adoption;
- **Output 1.2.** National Biosafety Committee (NBC) reactivated with updated membership, terms of reference, and operational budget plan;
- **Output 1.3.** Biosafety inter-agency coordination mechanism developed and formalized between EPA, Agriculture, Health, Customs, Standards Authority, and academia;
- **Output 1.4.** National Biosafety Clearing House (BCH) upgraded and linked to global BCH, with regular data updates;

In sum, by delivering these four outputs and their adoption by the Government: updated and operationalized implementing regulations/SOPs, an active NBC, inter-agency coordination, and an upgraded BCH – Outcome 1 will be achieved. The country will have an adopted regulation and guidelines framework and empowered institutions to enforce biosafety measures consistent with the Cartagena Protocol, positioning it to safely manage biotechnology and LMOs. This integrated approach addresses legal gaps, provides administrative mechanisms, and ensures information flow, thereby laying the groundwork for effective enforcement of biosafety standards. Achievement of the Outcome 1 is based on the following **assumptions:** (a) the government will maintain strong political will to support biosafety initiatives; (b) there are no major political upheavals or shifts in priorities that could derail the legal adoption process; (c) the relevant institutions are willing and able to collaborate under the new framework; (d) sufficient financial resources will be available to implement and sustain the biosafety framework. Component 1 will leverage the **GEF Lever 1 – Governance and Policy** and **GEF Lever 3 – Multi-Stakeholder Dialogue** aiming to transform NBF policy and institutional landscape in Yemen ensure its sustainability through legal and institutional anchoring, financial commitment, capacity development, and international engagement. With the Biosafety regulations and guidelines operational, funded coordination mechanism in place, the national biosafety framework established under Outcome 1 is expected to endure and continue protecting biodiversity and human health long after the project's completion.

Component 2 will be implemented in strong synergy with the Component 1 and is expected to remove the **Barrier 2:** *Low institutional capacity for biosafety risk assessment, monitoring, and enforcement* and achieve the **Outcome 2:** *Strengthened national biosafety capacity for scientific risk assessment, decision-making on LMOs, border control, and monitoring.* The Outcome 2 will be achieved through delivery of three Outputs:

- **Output 2.1.** Scientific Risk Assessment Committee (SRAC) established and trained in GMO risk assessment, detection, and management
- **Output 2.2.** National GMO detection laboratory equipped and operationalized (PCR-based), with trained technicians
- **Output 2.3.** Customs and Quarantine officers trained on biosafety inspection, documentation verification, and GMO sampling and equipped with portable GMO detection kits

Thus, the Outcome 2 will be achieved by delivering three interrelated outputs, each addressing a critical capacity gap. Together, these outputs create a comprehensive system for biosafety oversight, aligning with international best practices under the Cartagena

Protocol on Biosafety. Achievement of the Outcome 2 relies on the following assumptions: (a) the government will formally mandate and support SRAC so that its advice is integrated into LMO approval processes; (b) the lab will be formally designated as a national reference laboratory and integrated into the biosafety framework (so its results can be used for official decision-making), and that sufficient resources (personnel, reagents, maintenance) will be allocated to keep the lab operational long-term; (c) trained officers will be deployed at all major entry points and that their superiors will support thorough enforcement of biosafety measures (i.e., allowing inspections and sampling of shipments). Outcome 2 is based on the **GEF Lever 1 – Governance and Policy** and **GEF Lever 4 – Innovation and Learning** with its sustainability ensured by anchoring the biosafety capacities in Yemen's governance framework and by providing the needed financial, human, and policy support on an ongoing basis. High-level government commitment is pivotal here: for instance, approving any pending biosafety regulations and empowering the national biosafety committee and lab to carry out their duties is a priority for making these results last. Encouragingly, when national authorities take ownership (such as retaining key project staff under government payroll and creating dedicated biosafety units), it greatly creates conditions for the sustainability of project initiatives and results.

Component 3 will use inputs from Components 1 and 2, and address the **Barrier 3:** *Low public awareness, knowledge and engagement in the national biosafety issues*, and achieve the **Outcome 3:** *Increased public understanding and stakeholder participation in biosafety decision making.* Outcome 3 is expected to materialize via delivery of two **Outputs**:

- **Output 3.1.** National biosafety awareness campaign launched, and multi-stakeholder dialogues conducted on GMO issues, involving farmers, industry, NGOs, and consumer associations;

- **Output 3.2.** Project knowledge products, including Biosafety Resource Mobilization and Sustainability plan, uploaded to BCH and shared with Arab Region biosafety network.

Output 3.1 designed to educate the public and bring all key groups into the conversation, thereby boosting biosafety awareness and trust. Experience from other biosafety projects shows that such outreach can greatly raise public awareness, though genuine participation in GMO decision-making must be actively encouraged through dialogue. At the same time Output 3.2 will ensure that up-to-date biosafety information, best practices, and the sustainability strategy are accessible to stakeholders nationally and regionally. Both Outputs will lead to increase public understanding and stakeholder participation in biosafety decision-making in Yemen. Achievement of the Outcome 3 has the following assumptions: (a) stakeholders are willing to engage in biosafety dialogue; (b) authorities support transparent biosafety information sharing, and that the BCH and regional networks are effectively utilized. If these assumptions hold, the combined effect of widespread biosafety awareness campaigns and accessible knowledge resources will empower more people to understand biosafety and take part in decisions, fulfilling Outcome 3's goal of broad stakeholder participation in Yemen. The Component 3 is based on the **GEF Lever 3 – Multi-Stakeholder Dialogue** and **GEF Lever 4 – Innovation and Learning** to ensure transformation in public understanding and engagement in biosafety and institutionalize and continue these efforts beyond the project's end. The Biosafety Resource Mobilization and Sustainability Plan (developed under Output 3.2) will lay out how to secure funding and political support for ongoing public outreach and education on biosafety. This is crucial because maintaining a fully operational biosafety framework, with awareness programs and stakeholder engagement, requires stable resources and commitment. By integrating biosafety awareness into existing institutions (for example, agriculture extension services, schools, or civil society programs), the country can keep the momentum of the national campaign going. Moreover, all knowledge products and lessons learned are being stored on the BCH, which will remain as a permanent platform for information exchange. Sharing these resources with the Arab regional biosafety network also fosters a community of practice that can continue to support Yemen with expertise and updates.

Participatory and gender-responsive Monitoring and Evaluation system is designed to support Components 1-3 in effective delivery of the Outputs and achievement of the Outcomes 1–3. The M&E system will be embedded across Components 1–3 through a Project Results Framework co-designed with EPA, Agriculture, Health, Customs, Standards Authority, academia, NBC/SRAC members, and women's and youth organizations, and tracked with sex-, age-, and disability-disaggregated data. Continuous learning and adaptive management will be hard-wired via quarterly learning sessions, PIR reflections, and a live risk log. Target audience feedback loops will feed into NBC/SRAC and PMU decisions and will be summarized on the national BCH page for transparency. In this way, evidence, voice, and inclusion will jointly steer the project adaptive management that keeps Outputs on track and ensure Outcomes 1–3 are achieved efficiently and equitably.

The **achievement of the Project Objective**— *operational Yemen's National Biosafety Framework fully compliant with Cartagena Protocol* —is driven by the successful achievement of the three project Outcomes described above. Together, Components 1-3 remove the key barriers to NBF operationalization resulting in systemic and transformative change in NBF implementation in Yemen. Component 4 complements this effort by establishing a participatory, inclusive, and gender-responsive monitoring and evaluation (M&E) system. This system will not only measure the project's effectiveness but also facilitate adaptive management to ensure continuous improvement and alignment with project goals.

Key lessons applied for this project

This project approach integrates several critical lessons learned from other NBF projects:

- **Regulations and executive decrees can operationalize CPB requirements:** The Cartagena Protocol encourages parties to establish legal, administrative and policy measures. Many countries use executive regulations and ministerial guidelines under existing laws to control LMOs. In Africa, Zambia has approved GM crop applications even though it has not established a biosafety law, and the DRC manages genome-editing technologies despite lacking a biosafety law. Benin, Eswatini and Uganda apply existing biosafety regulations to genome-editing without amending their laws[1][28]. These examples show that regulations and guidelines issued under existing legislation can provide sufficient legal basis for risk-assessment, authorization, monitoring and enforcement.

- **Inclusive, cross-agency coordination greatly improves biosafety governance:** Lessons from other countries show that broad stakeholder involvement in drafting regulations builds consensus and political support. Establishing a national biosafety committee or coordinating body with representatives from all relevant ministries (environment, agriculture, health, customs, academia, etc.) helped align efforts and avoid institutional gaps. Involving civil society and sector experts in these committees also **fostered trust and buy-in** for biosafety measures, smoothing the implementation of new regulations and guidelines[2][29].

- **Investing in scientific capacity and tools is critical for effective biosafety:** Comparable projects have shown that equipping a GMO detection laboratory and training personnel (scientists, risk assessors, customs officers) markedly **strengthens a country's ability to detect and manage LMOs.** However, one-time trainings are not enough – **continuous training and updated technical guidelines** (e.g., for risk assessment, inspections, field trials) are needed to maintain an expert workforce in the face of staff turnover. For example, Namibia's biosafety project developed detailed inspection manuals (with support from regional experts) and emphasized ongoing capacity-building, which proved essential for sustained monitoring and enforcement[3][30].

- **Engaging the public and stakeholders early leads to better biosafety outcomes:** Other national biosafety framework initiatives learned that public education campaigns and stakeholder dialogues are **crucial for building understanding and acceptance** of biosafety regulations. Including stakeholder representatives (farmers' groups, industry, NGOs, etc.) in decision-making forums like national committees was an effective way to build consensus on biosafety policies. Countries such as Kenya and Cuba even developed dedicated biosafety awareness strategies to target the right audiences and sustain outreach beyond the project[4][31]. This lesson underlines that well-informed stakeholders are more likely to support and comply with biosafety measures in the long run.

- **Collaboration with other countries amplifies success:** Projects in countries with similar situations have benefited from exchanging experiences, guidelines, and even laboratory resources across the region. For instance, experts recommend that **neighboring countries share reference GMO detection labs and standardized protocols** to save costs and ensure high testing standards for the whole region. In addition, translating biosafety documents into local languages and using regional networks to disseminate best practices were found to be essential for effective knowledge transfer in Arab states and beyond[5][32]. Such South–South cooperation accelerates learning and helps **embed the Cartagena Protocol's principles consistently across countries.**

Suggested project sites (Fig. 2). This is a national level project with key activities implemented in **Aden** - host of the Cartagena Protocol National Focal Point; practical home for NBC secretariat and the BCH node upgrade; and national GMO detection laboratory. Priority points-of-entry for Customs/Quarantine/Port Health capacity building on biosafety (Component 2) are: **Port of Aden** and **Aden International Airport** (main commercial gateway; training/sampling hub) in addition to Yemen Standardization Metrology & Quality Control Organization; **Port of Mukalla (Mukalla)**: primary gateway for Hadhramaut/Shabwah/Al-Mahrah;

Nishtun Port (Al-Mahrah Port): key for Oman trade/aid flows to the east; **Al-Wadi'ah (Saudi Arabia)** and **Shahn/Shehn (Oman) border crossings**: highest-value crossings for border control training and field screening, **Al-Koud Research Center (Abyan),** the most prominent agriculture research center in Yemen. Key sites for Component 3 are **Aden, Mukalla, Abyan**, and (if conditions permitting) to reach port communities, farmers, traders, universities, Agriculture Research and Extension Authorities, and regulators across both administrative zones.

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[2] wedocs.unep.org

[3] open.unep.org; wedocs.unep.org

[4] wedocs.unep.org

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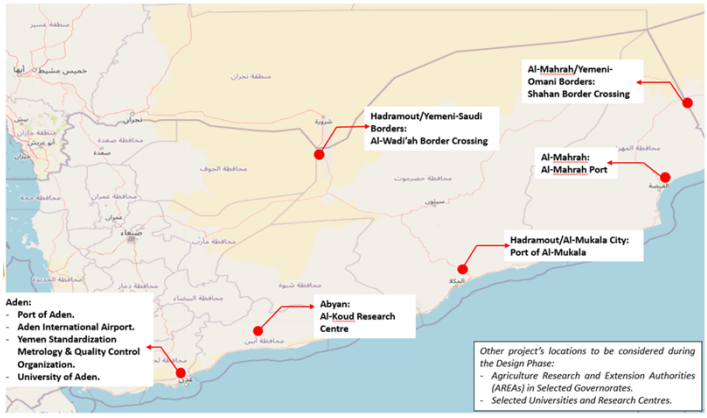


Figure 1. Yemen NBF project sites

Incremental Cost Reasoning

Business-as-Usual Scenario: Yemen has been a Party to the Cartagena Protocol on Biosafety (CPB) since 2006, but a decade of instability has left its National Biosafety Framework (NBF) largely unimplemented. In the baseline scenario, no dedicated biosafety regulations are in force: the 2005 draft law stalled, and the legal/institutional framework remains nonoperational. Only minimal biosafety activities persist, such as occasional reporting to the CPB and a rudimentary Biosafety Clearing House node, supported by past global projects. *De facto*, Yemen lacks the capacity to assess or control living modified organisms (LMOs): the National Biosafety Committee is inactive, border inspectors have no GMO screening tools, and labs are unequipped for GMO detection. This means that without additional intervention, Yemen will continue to be unable to reliably regulate or monitor LMOs, resulting in unmitigated risks (e.g. unsafe transboundary GMO imports or accidental releases) and continued non-compliance with CPB safeguards. The existing baseline thus yields strictly local development benefits (general institutional strengthening) but provides no effective global environmental benefits in terms of biodiversity protection from biotechnology risks.

Incremental GEF Contribution: The GEF-funded project will *bridge the critical gaps* identified above by operationalizing Yemen's NBF through targeted legal, technical, and educational measures. First, it will facilitate the adoption of a national Biosafety implementing regulations and guidelines under existing laws, finally establishing a binding rules-based system for LMO handling in line with the CPB. The project will reactivate a multi-sector National Biosafety Committee and create a Scientific Risk Assessment Committee, ensuring that Yemen has functional, gender-balanced bodies to make science-based decisions on LMOs. It will also invest in capacity building and infrastructure: equipping a national GMO detection laboratory (PCR-based) and training 100+ customs, quarantine, and port health officers (at least 30% women) on GMO inspection, documentation, and sampling. Additionally, an inter-agency coordination mechanism (EPA, Agriculture, Health, Customs, Standards) will be formalized to improve enforcement (e.g., joint SOPs for border referrals). Concurrently, the project's awareness component will launch a public education campaign (using radio, social media, and community workshops) to inform farmers, consumers, and youth about biosafety, and it will upgrade the national Biosafety Clearing House with up-to-date records and risk assessment summaries. These incremental activities made possible by about US $1 million of GEF financing (plus co-financing from national and partner contributions) go well

beyond the conflict-constrained baseline. The GEF investment thus transforms the baseline: from a dormant framework to an operational biosafety system that can function even under Yemen's challenging conditions (using flexible, "lean and modular" approaches to remain effective across different future scenarios).

Expected Global Environmental Benefits of the project

With GEF support, Yemen's biosafety initiative will generate significant **global environmental benefits (GEBs)** that the baseline would not achieve:

- **A functioning NBF will enable Yemen to fulfill its obligations under the Cartagena Protocol** – an international agreement aimed at protecting biological diversity (and human health) from potential adverse effects of GMOs. By enforcing safe handling, transport, and risk assessment of LMOs, the project directly contributes to the conservation of biodiversity (including Yemen's agrobiodiversity and neighbouring ecosystems that could be affected by transboundary movements). It also enhances global transparency and trust through information-sharing: an active Biosafety Clearing House and clear documentation of Yemen's decisions will support the international exchange of biosafety data. These outcomes have global significance because biosafety threats do not respect borders, so strengthening Yemen's controls reduces regional and international risk of unauthorized or unsafe GMO release. In the absence of GEF assistance, such benefits would remain unrealized, as national stakeholders alone could not finance or coordinate the needed reforms amid ongoing crises. The incremental reasoning is that GEF funds the additional actions required to secure these global benefits (biodiversity protection, safe biotechnology practices, and compliance with a global treaty) on top of the baseline. In short, the project is a "no-regret" investment: it establishes a durable, shock-tolerant biosafety system that safeguards global environmental interests now and into the future, transforming Yemen's ad-hoc, negligible baseline into a robust framework for responsible biotechnology governance;

- Additionally, the project has a significant number of **direct and indirect beneficiaries** (GEF Core Indicator 11): Approximately **1,000 direct beneficiaries** (>=30-40% are women) drawn from regulators and stakeholders (NBC/SRAC members, EPA/BCH staff, laboratory technicians, and ~100 Customs/Quarantine/Port Health officers, plus additional inspectors and focal points) that will receive targeted training, equipment, SOPs, and clear mandates. They will benefit through enhanced skills and tools to assess LMOs, enforce biosafety decisions at borders, operate PCR-based detection, and keep the BCH updated, improving institutional performance and career prospects. At least **200,000 indirect beneficiaries** (>=30-40% are women) reached via radio/social media/print/WhatsApp: consumers, farmers, traders, and communities around priority ports and markets, that will gain accurate biosafety information and safer supply chains. They benefit from reduced risks of unsafe GMO imports/releases, clearer grievance channels, and more predictable, rules-based trade that protects agrobiodiversity and food safety.

Expected Co-Benefits of the project

Based on the *STAP Information Brief on Refining the Tracking of Co-Benefits in Future GEF Investments[1]*, the co-benefits of this project in Yemen can be classified into **prerequisite co-benefits** and **incidental co-benefits**. Below is a brief assessment of the project's co-benefits:

Prerequisite co-benefits (enable durable GEBs): Per STAP, some co-benefits are essential to achieving and sustaining the project's global environmental benefits: better governance and policies, multi-stakeholder dialogue, learning/innovation, and financial leverage. For Yemen, these translate into a functioning, gender-balanced NBC/SRAC and inter-agency SOPs that reduce leakage and corruption risk; enhanced public trust and risk communication that lowers rumor and resistance; and institutional capability (trained inspectors, operational PCR lab, active BCH) that keeps biosafety decisions enforceable over time even under fragility. These co-benefits are designed into the ToC and should be tracked within the project's M&E because they are prerequisites for durable CPB compliance and biodiversity protection.

Incidental co-benefits (demonstrate wider value): The project also yields important, non-mandated co-benefits that should be measured only where efficient: improved food safety confidence and consumer protection; fewer border disputes and faster, rules-based clearance for compliant trade and humanitarian shipments; reduced institutional and private-sector transaction costs; and human well-being gains from clearer grievance channels and risk information. Where feasible, STAP advises drawing on existing SDG/MEA indicators (e.g., service quality, livelihoods, portfolio learning) and using them to complement core GEB tracking, thereby evidencing the project's broader return without distracting from its primary objective of safeguarding biodiversity through effective biosafety.

[1] **Stafford Smith, M., & Metternicht, G. (2022).** *Refining the tracking of co-benefits in future GEF investments: A STAP Information Brief.* Scientific and Technical Advisory Panel (STAP) to the Global Environment Facility (GEF), Washington, DC. Available at: https://stapgef.org

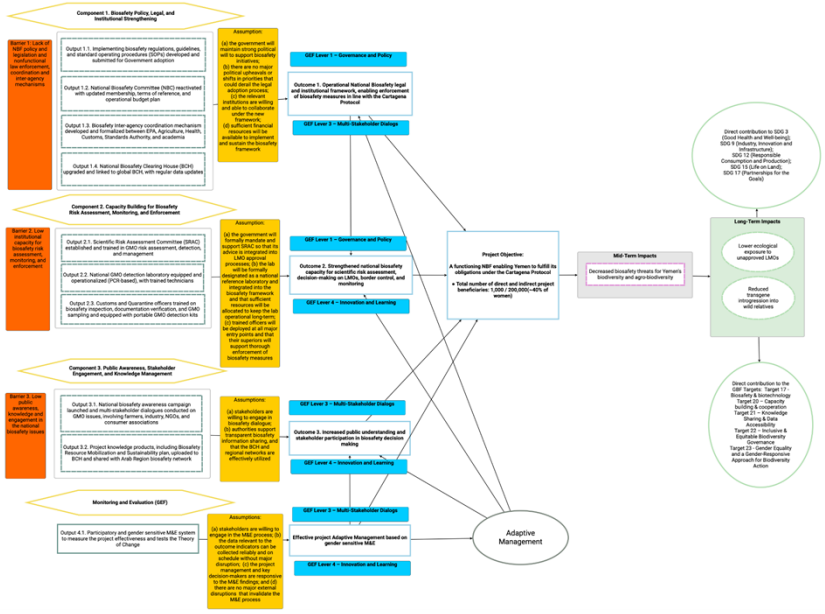


Figure 2. Theory of Change of the Project

Project Outputs (direct project products and services)

Brief description of the project Outputs is provided below:

Component 1. Biosafety Policy, Legal, and Institutional Strengthening

Outcome 1. Operational National Biosafety legal and institutional framework, enabling enforcement of biosafety measures in line with the Cartagena Protocol

Output 1.1. Implementing biosafety regulations, guidelines, and standard operating procedures (SOPs) developed and submitted for Government adoption

This output will produce a complete, adoption-ready regulation and guideline instruments package that operationalizes the Biosafety Framework and CPB obligations in the current situation in Yemen, comprising: (i) an Executive Regulation and specific regulations on LMO import/transit/contained use/field trials and environmental release; (ii) labeling and documentation rules aligned to CPB Art. 18.2(a–c) (including LMO-FFP "may contain" language and consignee/identity data); (iii) inspection, sampling, chain-of-custody, and enforcement procedures for Customs/Quarantine/Port Health/YSMO (with an evidence-handling ladder: warning–detention–return/destruction–sanctions); (iv) risk assessment/decision-making and appeals procedures (Annex III problem formulation, comparators, uncertainty, conditions, time limits); (v) post-release monitoring, incident reporting, emergency measures, and a grievance redress mechanism; and (vi) a cost-recovery schedule (fees) and BCH disclosure rules. User-friendly technical guidelines and SOP bundles in Arabic/English, low-bandwidth printable, and mobile-friendly will include border decision trees, sampling plans by commodity/lot size, tamper-evident sealing and sample retention, lab referral templates, QA/QC steps, post-release monitoring forms, standard decision records, and public-facing summaries for the BCH. All instruments will be cross-referenced to existing Yemeni laws (environment, quarantine, food/health, standards/customs) and international good practice (WTO SPS/TBT consistency), legally vetted by the Ministry of Legal Affairs, and validated through targeted workshops with regulators, brokers/importers, labs, farmers, and consumer groups (≥40% women participants). To ensure swift uptake, the package will be submitted with a Cabinet Memorandum, model ministerial decrees for line agencies, and a rollout plan (training-of-trainers, job-aids, and on-site drills at priority ports/airports/land borders), while a contingency path allows interim adoption via Council of Ministers resolutions and inter-agency administrative instructions if parliamentary timetables are delayed. Finally, templates, checklists, and FAQs will be published on the national BCH, with a three-year review clause and a living SOP update protocol managed by the NBC Secretariat to keep procedures current and feasible under Yemen's operating conditions.

Output 1.2. National Biosafety Committee (NBC) reactivated with updated membership, terms of reference, and operational budget plan

The NBC will be reconstituted by ministerial order as an 11–15 member, multisector body with ≥30% women participation, comprising: EPA (Chair/Competent Authority); Ministry of Agriculture & Irrigation/Plant Protection & Quarantine (NPPO); Ministry of Public Health & Population (food/health risk); YSMO (standards/labeling); Customs Authority; Ministry of Industry & Trade; Ministry of Legal Affairs (legal counsel); Higher Education/Science (e.g., university biosafety/biosecurity expert), Agricultural Research & Extension Authority (AREA)/research institutes, and civil society/private sector (farmers' organization, consumer association, and an importer/food processor). The SRAC Chair and BCH National Focal Point will attend NBC meetings as non-voting technical observers. Updated TORs will set quorum, decision rules (simple majority with recorded minority opinions), conflict of interest and recusal procedures, case-handling workflows (referral to SRAC, timelines, documentation standards), and disclosure of non-confidential decisions via the BCH. A lean EPA-hosted secretariat (Coordinator, Legal/Policy Officer, Admin/Comms) will maintain a case registry, meeting calendar, templates (agendas, decision memos, public summaries), while an annual workplan and costed budget will fund quarterly NBC meetings, stakeholder hearings, targeted field visits to ports/markets, and publication/translation. Induction training for NBC (CPB/AIA & Annex III, gender-responsive governance, risk communication, conflict sensitivity) and a mock case-review with SRAC will be provided, ensuring the NBC can function credibly, transparently, and consistently under Yemen's operating conditions.

Output 1.3. Biosafety inter-agency coordination mechanism developed and formalized between EPA, Agriculture, Health, Customs, Standards Authority, and academia

This output will establish a binding Inter-Agency Biosafety Coordination Mechanism (IBCM) through a Cabinet-cleared MoU signed by EPA (competent authority), MoAI/Plant Protection & Quarantine, MoPH&P/Port Health, Customs Authority, YSMO, and a designated academic partner (e.g., AREA/university) as technical backstop. The MoU will fix roles, triggers, and timelines along the whole pathway: pre-arrival risk triage, document checks (CPB/Art.18), sampling & chain-of-custody, lab referral, decision notification, enforcement (hold/re-export/destruction), appeals, and BCH disclosure of non-confidential decisions. A joint SOP suite (Arabic/English) will include: red-flag matrices by commodity/HS category, sampling plans by lot size, tamper-evident sealing, evidence handling, incident/rumor management, emergency notifications, and templates (referral forms, seizure/hold notices, decision memos, public summaries). Day-to-day operations of IBCM will run through a network of agency focal points (≥30% women among them) with a rotating Duty Officer, a shared case-tracking log (unique case IDs; time stamps from interception to decision), and contact rosters; communications will use low-bandwidth channels (WhatsApp/SMS lists and USSD alerts), plus printable job-aids for checkpoints with unstable connectivity. The mechanism will be exercised via semi-annual joint drills (table-top + live at priority ports/airports/land borders), with after-action reviews, refresher training, and a living SOP update protocol overseen by the NBC Secretariat; a contingency annex will define hub-and-spoke operations during access disruptions (mobile sampling, couriered composites, remote approvals). To ensure durability, the ICBM will have a costed micro-budget (meetings, drills, data bundles, courier/consumables), a performance dashboard (e.g., % cases with intact chain-of-custody, median lab turnaround, # joint inspections), and a clause to review and renew the MoU every three years.

Output 1.4. National Biosafety Clearing House (BCH) upgraded and linked to global BCH, with regular data update

The project will deliver a lightweight, bilingual (Arabic/English) national BCH microsite plus full use of the CBD BCH Management Centre, with clear publishing authority (BCH National Focal Point) and deputies designated by ministerial order to avoid single-point failures. Standardized workflows and SOPs will govern what is posted and when on national BCH. The system will be optimized for low bandwidth (compressed assets, printable PDFs), equipped with offline-first tools (templated decision summaries, email-to-BCH upload, and monthly USB/portable-drive backups), and supported by UPS/backup power and mirrored hosting (EPA primary, CBD pages as failover). A small BCH team (Coordinator, Content Editor, and IT support; ≥1 woman) will be trained to curate metadata, run quarterly quality checks, and generate analytics, with results shared at NBC meetings. Public-facing knowledge pages (FAQs, process flowcharts, complaint/GRM link, rumor-management notes) and a feedback form will strengthen transparency and trust, while APIs/cross-links connect the BCH to the inter-agency case log (Output 1.4), so public summaries can be generated from the same source data. Sustainability of BCH will be ensured through an EPA budget line for domain/hosting/translation, a maintenance MoU with the national IT unit, and a three-year content review clause so records, templates, and links remain current and compliant with Cartagena Protocol reporting requirements.

Component 2. Capacity Building for Biosafety Risk Assessment, Monitoring, and Enforcement

Outcome 2. Strengthened national biosafety capacity for scientific risk assessment, decision-making on LMOs, border control, and monitoring

Output 2.1. Scientific Risk Assessment Committee (SRAC) established and trained in GMO risk assessment, detection, and management

The SRAC will be constituted by ministerial order as a 10–12-member expert body (≥30% women) drawn from experts on molecular biology/biotechnology, plant ecology/agronomy, food safety/toxicology, public health/epidemiology, environmental law/ethics, and risk communication, with the national GMO lab manager and BCH focal point attending as non-voting technical observers. EPA will host a lean SRAC secretariat to register dossiers, screen for completeness/CBI, and manage timelines that align with CPB decision windows. Operating documents will include Annex III-aligned TORs, a conflict of interest and recusal policy, standardized templates for problem formulation, exposure pathways, comparators, uncertainty analysis, and socio-economic considerations (CPB Art. 26), plus model language for conditional approvals, risk-management measures, and post-release monitoring. A competency program will build SRAC skills in interpreting PCR screening/event-specific results, assessing gene flow and non-target impacts, food/feed safety bridging to international guidance, incident triage, and risk communication under low-bandwidth conditions; members will complete annual refreshers. To widen surge capacity, the project will establish a vetted roster of external subject matter experts and a twinning arrangement with a regional reference body for remote peer review, method validation advice, and joint mock-case workshops. Quality assurance will be ensured through documented minutes, recorded minority opinions, a citation pack for each decision, and a periodic meta-review of SRAC opinions by the NBC; non-confidential summaries of opinions will be cleared for publication to the BCH. Shock-tolerant operations (hybrid/asynchronous reviews, secure document sharing, e-signatures, and pre-approved emergency procedures) will allow the SRAC to function during access constraints. A modest, costed SRAC budget and a three-year CPD plan will anchor the committee institutionally, so its scientific advice consistently informs legally robust, transparent biosafety decisions. This output will also develop a National Risk Assessment and Management Manual to standardize biosafety practices, offering guidance on monitoring, compliance, and enforcement for activities involving GMOs, including development, use, transfer, movement, packaging, contained use, field testing, importation, and other applications in Yemen. The manual aims to mitigate potential risks to human and animal health and the environment.

Output 2.2. National GMO detection laboratory equipped and operationalized (PCR-based), with trained technicians

Under this Output, the project will co-locate/upgrade an existing public laboratory (e.g., EPA/MoPH/AREA facility) rather than build new space, creating a basic unidirectional workflow (separate pre-PCR setup, amplification, and post-PCR analysis benches) with color-coded pipettes/consumables to prevent contamination. The lab will be fitted with a bench-top real-time PCR (qPCR) unit, a small conventional thermal cycler as backup, mini-centrifuges, calibrated micropipettes, a PCR hood/UV decontamination, gel documentation (as needed), and a cold chain (4 °C refrigerator and −20 °C freezer), plus UPS/inverter power backup sized for critical runs; biological waste will be deactivated with UV/chemical methods and disposed per national rules (shared autoclave access if available). A screen-first, confirm-selectively testing strategy will be used: validated screening assays will run in duplicate with positive/negative/NTC controls, and event-specific assays applied only when screens are positive; where complex confirmation is needed, a twinning MoU enables referral to a regional reference lab to avoid high reagent costs. Technicians (2–3 staff, ≥1 woman) will complete a short, hands-on curriculum plus one external proficiency test/ring trial, and the lab will operate under fit-for-purpose SOPs (sample receipt/logging, DNA extraction, amplification, QA/QC, report templates, CBI handling), a simple barcode + chain-of-custody system linked to the Output 1.4 case log. A ISO/IEC 17025-readiness roadmap (document control, equipment calibration logs, internal audits) will be prepared without pursuing full accreditation in-project; minimum QA will be assured through routine blanks, duplicates, and periodic supervisory review of Ct traces. To sustain O&M, the lab will adopt a lean consumables plan and a fee-for-service schedule for non-regulatory samples endorsed by the NBC; formal designation as the national GMO test lab will ensure its reports inform official decisions, with non-confidential summaries transmitted to the BCH. As part of the national laboratory's setup, a national Monitoring and Inspection System will be established to ensure compliance with national GMO handling guidelines, promote biosafety, and mitigate risks.

Output 2.3. Customs and Quarantine officers trained on biosafety inspection, documentation verification, and GMO sampling and equipped with portable GMO detection kits

The project will deliver a practical frontline biosafety training program for Customs and Quarantine officers covering priority seaports, airports, and land crossings with Saudi Arabia and Oman. The training will include 2-3 day core course and one day of on-site practicum for ≥100 officers (≥30% women) to build competencies in CPB/Art.18 documentation checks, red-flag targeting (HS codes for seeds/soy/maize/canola/feed; incomplete “may contain” declarations; high-risk origins; inconsistent bills of lading), statistically valid sampling, tamper-evident chain-of-custody, safe handling/PPE, and referral protocols to the national lab/NBC-SRAC. Training materials will include decision trees, sampling calculators by lot size, photo job-aids for seals/labels, and one-page checklists for holds, re-export, or destruction. Each priority point will receive a lean field kit for triage: grain probes/scoops, single-use sample bags and evidence tape, barcoded seals/labels, gloves/masks, coolers with ice packs, portable grinders, disposable weighing boats, and rapid screening supplies (DNA mini-prep tubes with simple endpoint checks and/or validated lateral-flow strips for common GMO elements), with immediate referral to the PCR lab (Output 2.2) for confirmation per SOPs. The project will train 20 officers as on job trainers for other staff to support staff rotations and new hires. The project will equip 8–10 entry points with biosafety field kits.

Component 3. Public Awareness, Stakeholder Engagement, and Knowledge Management

Outcome 3. Increased public understanding and stakeholder participation in biosafety decision making

Output 3.1. National biosafety awareness campaign launched and multi-stakeholder dialogues conducted on GMO issues, involving farmers, industry, NGOs, and consumer associations

The project will run a phased, low-bandwidth campaign co-designed with EPA/NBC/SRAC and local partners, prioritized in key hubs (active ports/airports/land crossings) where biosafety decisions and trade intersect. Content pillars will explain what biosafety/LMOs are, how AIA/decision-making works, citizen rights to participate/comment, labeling & documentation basics (Art. 18), how to verify information on the BCH, and how to report concerns, all in plain Arabic with local dialect adaptation and simple visuals disseminated through dedicated digital platforms. Delivery will mix community radio PSAs, live call-in shows, town-halls/market days/extension meetings, WhatsApp broadcast notes, printable posters/FAQ cards/myth-buster sheets, and a USSD/SMS short code; trusted messengers (agriculture extension, port health nurses, university lecturers, women's associations, youth leaders) will front the messages to boost credibility. A structured dialogue will track sector roundtables with farmers, seed/feed importers, retailers, NGOs/consumer groups, and universities (≥40% women, ≥30% youth) and will gather feedback on draft instruments, map pain points at borders/markets, and produce short public summaries for the BCH. A lightweight rumor log & escalation protocol will be maintained with monthly triage (what's trending, what to clarify), rapid rebuttal templates, and pre-cleared talking points to avoid misinformation. Monitoring will use baseline/endline KAP mini-surveys, event sign-ins, quick SMS polls, and digital analytics to document reach (target ≥200,000 people), participation, and ≥25% gain in correct answers to key questions by EoP; lessons will feed back into quarterly content refreshes and NBC briefings. Inclusion and safeguarding will be built in the campaign: venues/times accessible to women and youth, disability-aware materials (readable fonts/alt-text/audio spots), small travel stipends where needed, and strict neutrality/conflict-sensitive facilitation, keeping costs realistic by leveraging community radio, partner venues, and existing extension networks.

Output 3.2. Project knowledge products, including Biosafety Resource Mobilization and Sustainability plan, uploaded to BCH and shared with Arab Region biosafety network

The project will produce a modular, bilingual (Arabic/English) knowledge package under an open license, designed for low-bandwidth and offline use (printable PDFs, DOCX/XLSX forms, and a zipped SOP Pack/USB set). Products will include: (i) a Regulatory Toolkit (model decrees, BCH disclosure templates, CBI-redaction checklist); (ii) Border & Enforcement Toolkit (decision trees by HS code, chain-of-custody forms with barcode fields, hold/re-export/destruction templates); (iii) Lab Toolkit (screening/event assay SOPs, QA/QC checklists, Ct review guide, proficiency test playbook); (iv) SRAC Toolkit (Annex III problem formulation worksheets, uncertainty & socio-economic consideration notes, model opinion); and (v) Risk Communication Toolkit (radio scripts, myth-buster sheets, WhatsApp voice-note scripts, FAQ). Each file will carry metadata/versioning (owner, date, status, next review), taxonomy tags, and plain-language summaries; the NBC Secretariat will act as custodian, with an annual "content review day" to update and retire materials. The Biosafety Resource Mobilization & Sustainability Plan will present a 5-year, costed O&M profile (BCH hosting/translation, NBC/SRAC meetings, lab reagents & maintenance, drills), minimum staffing, cost recovery levers (fee-for-service testing for non-regulatory samples; modest permit fees), budget line integration in MWE/EPA's MTEF, and a donor/partner pipeline (multi-partner small grants, twinning for reagents/proficiency tests), with clear risk triggers & mitigations. The Plan will be reviewed and adopted by MWE for implementation. Dissemination of KM materials will combine BCH uploads (national + CBD portal) with regional sharing through CPB/Arab biosafety networks (webinars, 2–3 practitioner workshops, and twinning office hours), plus a short "How to adopt" briefing for peer agencies. Uptake will be tracked via KM indicators, quick user surveys, and a feedback loop that feeds directly into the NBC/SRAC and the Inter-Agency Biosafety Coordination Mechanism (IBCM) case-log so content stays practical, current, and used beyond project close.

Participatory and gender- responsive Monitoring and Evaluation Framework

Output 4.1. Participatory, inclusive, and gender-responsive M&E system is implemented to measure the project effectiveness, and support Adaptive Management

Under this Output the project will develop and implement a participatory and gender- and youth-responsive M&E framework in accordance with the Results-Based Management (RBM) approach practiced by UNDP and GEF. For the M&E, the project will use Output, Outcome, and Impact (GEB) Indicators monitored at quarterly and annual basis. M&E system will be applied to monitor the project effectiveness, check the project assumptions, and practice adaptive project management. It will actively ensure the participation of women, youth, and other vulnerable groups in the monitoring processes, ensuring their perspectives and feedback

are integrated into adaptive management decisions. The M&E system will be a key tool for adaptive project management, enabling project teams to monitor project effectiveness, validate key assumptions, and adjust strategies based on real-time feedback. The findings from this continuous learning process will directly inform Outputs under Components 1-3, and will feed into the project adaptive management. Compliance with UNDP SES and GEF requirements will be assured through quarterly reviews and publicly accessible summaries for transparency and accountability.

Key Stakeholders

The project Outputs will be delivered with the support of active stakeholder involvement, ensuring a collaborative and participatory approach to National Biosafety Framework in Yemen. The project concept was developed using a transparent, inclusive, and fully participatory process, engaging key stakeholders at national, provincial, and local levels, including the MWE, EPA, other government authorities, NGOs, research institutions, private sector actors, and development partners. Initial consultations were conducted during the PIF development phase to: (1) inform all stakeholder groups about the project's objectives, scope, and expected impacts, and provide an opportunity for meaningful participation; (2) identify key risks related to project implementation, long-term sustainability, and stakeholder coordination, and develop preliminary risk mitigation measures; (3) determine potential project partners and clarify stakeholder roles and responsibilities; and (4) obtain initial co-financing commitments and explore potential investment opportunities for scaling up project interventions. As a result of the stakeholder consultations, the key groups of project stakeholders were identified for the project development and implementation:

- **Ministry of Water & Environment / Environment Protection Authority (EPA)**: Competent Biosafety Authority and project Implementing Partner; steers regulation and guideline adoption, houses the NBC Secretariat and BCH node, signs the inter-agency MoU/SOPs, and coordinates project implementation and reporting;
- **Ministry of Agriculture & Irrigation / Plant Protection & Quarantine (NPPO)**: Leads seed/plant import controls, field surveillance and referrals; co-writes inspection, sampling, and chain-of-custody SOPs; trains and deploys quarantine officers at priority entry points;
- **Ministry of Public Health & Population / Port Health**: Covers food/feed safety and health risk management; co-manages port-health checks, incident response, and laboratory biosafety; contributes to post-release monitoring conditions;
- **Yemen Standardization, Metrology & Quality Control Organization (YSMO)**: Develops and enforces LMO/LMO-FFP labeling and product standards (CPB Art. 18); supports market surveillance, conformity assessment, and consumer information;
- **Yemen Customs Authority**: Frontline documentary checks and risk-based targeting; executes holds/re-export/destruction orders; maintains evidence and chain-of-custody to the national lab; logs cases in the joint inter-agency tracker;
- **Ministry of Legal Affairs & Parliamentary Committees**: Legal vetting, Regulatory Impact Assessment, and shepherding of the Biosafety executive regulations through Cabinet/Parliament; ensures consistency with existing statutes;
- **National Biosafety Committee (NBC):** Multi-sector governance body that validates instruments, hears stakeholders, records decisions/conditions, and ensures transparency via BCH publication;
- **Scientific Risk Assessment Committee (SRAC):** 10–12 technical experts issuing Annex III-aligned opinions on LMOs, advising on risk-management and monitoring, and interfacing with the lab and NBC;
- **Universities & Research Institutes** (e.g., Sana'a University, University of Aden, AREA) & the designated **National GMO Test Lab**: Provide SRAC experts, run qPCR screening/confirmation with fit-for-purpose QA/QC, deliver trainings, and participate in twinning/proficiency testing;
- **Private sector & civil society** (farmers' organizations, seed/feed importers, food processors/retailers, brokers, consumer associations, media): Participate in dialogues and consultations, comply with labeling/testing rules, provide supply-chain data for risk triage, and co-deliver/amplify the national awareness campaign;
- **Development Partners:** UNDP (GEF Agency) and international partners (CBD/CPB-BCH Secretariat, FAO, WHO, PERSGA) backstop these stakeholders with technical guidance, capacity building, safeguards/M&E oversight, and targeted co-financing.

At the PPG Stage the project will produce a comprehensive Stakeholder Engagement Plan for the entire project lifetime to coordinate and manage stakeholders' involvement in the project activities as well as empower them. Project stakeholders and their roles in the project development and implementation will be explicitly described in the Plan. Stakeholder empowerment in the Yemen Biosafety Project will be anchored in shared decision-making, practical capacity, economic incentives, and transparent engagement. Communities, farmer groups, importers/retailers, universities, and NGOs will co-create the Biosafety regulations, guidelines, and SOPs through NBC-led consultations and SRAC hearings, with inclusion of women and youth, accessible venues, and disability-aware materials; a feedback loop tied to the BCH will ensure voice and accountability. Capacity will be built via tiered trainings for regulators (EPA, Customs/Quarantine/Port Health), SRAC experts, lab technicians, and private operators on Annex III

risk assessment, documentation and labeling (Art. 18), statistically valid sampling, and risk communication, supported by low-bandwidth toolkits and rumor-management protocols suited to fragile settings. Economic empowerment will come from predictable, rules-based clearance and a local fee-for-service GMO testing offer that lowers costs and downtime for SMEs, plus compliance coaching that de-risks supply chains. Ongoing engagement will be sustained through multi-stakeholder dialogues in port and production hubs, co-monitoring of border drills and post-release checks, and publication of non-confidential decisions and FAQs on the BCH—embedding citizens, businesses, and civil society as co-managers of a shock-tolerant, gender-responsive biosafety system.

Knowledge

Generating, curating, and using knowledge is central to operationalizing Yemen's National Biosafety Framework. Under Component 3 (Outputs 3.1–3.2), the project will stand up a bilingual (Arabic/English), low-bandwidth Knowledge package anchored in the upgraded national Biosafety Clearing House (BCH). This Hub will capture learnings from lawmaking, lab set-up, border drills, SRAC casework, and public dialogues, and feed them back into practice through short learning cycles, open licenses, and plain language products designed for fragile, low-connectivity contexts. The project will produce following core knowledge products:

- **Regulatory Toolkit:** model decrees, executive regulations, SOPs, compliance checklists, Regulatory Impact brief, and BCH disclosure templates;
- **Border & Enforcement Toolkit:** risk-based targeting matrices (by HS code), sampling calculators, chain-of-custody forms, hold/re-export/destruction templates, and joint drill playbooks;
- **Laboratory Toolkit:** qPCR screening/event-specific SOPs, QA/QC checklists, Ct-trace review guide, proficiency test playbook, biosafety/biosecurity job-aids;
- **SRAC Toolkit:** Annex III problem-formulation worksheets, socio-economic considerations notes (CPB Art. 26), model opinions, uncertainty guidance, and conflict-of-interest templates;
- **Risk Communication & Awareness Package:** radio PSA scripts, WhatsApp voice-note scripts, myth-buster sheets, FAQs, and a rumor management protocol;
- **Case Studies & After-Action Notes:** mock dossier reviews, border interception drills, lab troubleshooting, and gender/inclusion lessons from dialogues;
- **Training curricula & micro-modules:** slide decks and short e-lessons for inspectors, lab techs, SRAC/NBC members, brokers/importers, universities;
- **Biosafety Resource Mobilization & Sustainability Plan:** 5-year costed O&M for BCH, NBC/SRAC, lab reagents/maintenance, drills; fee-for-service schedule; donor/partner pipeline.

The project will apply the following knowledge sharing & visibility mechanisms:

- **Local workshops & hands-on trainings** in port/airport/land-crossing hubs and university labs, co-facilitated by agency focal points and ToT graduates;
- **National webinars & peer exchanges** for EPA, Agriculture, Health, Customs, YSMO, academia, private sector, and NGOs on regulation rollout, SOPs, and risk communication;
- **Regional learning** via CPB/Arab biosafety networks and twinning with a reference lab (office hours, joint PTs, method validation notes;
- **International outreach** at CBD/CPB, FAO/WHO biosafety fora to share Yemen's "lean and modular" NBF approach;
- **Digital Knowledge Repository on the BCH:** open access to toolkits, decisions' non-confidential summaries, SRAC opinion digests, and training materials; mirrored/backup options; USB "SOP pack" for offline use.

Project contribution to the policy coherence

The project advances policy coherence by hard-wiring horizontal, vertical, and temporal alignment into Yemen's biosafety system. Horizontally, it harmonizes environment, agriculture, health, customs, and standards through operational biosafety regulations and guidelines plus an inter-agency MoU and joint SOPs, so risk assessment, border referrals, labeling, and market surveillance pull in the same direction. Vertically, it links national rule-making (NBC/SRAC) with frontline practice at ports, airports, and land crossings via shared case logs and decision templates, while publishing non-confidential decisions to the BCH to sync national commitments with CPB obligations. Temporally, a costed Resource Mobilization & Sustainability Plan and fee-for-service testing protect durability

of outcomes beyond the grant. This mirrors STAP's framing: foster synergies, manage trade-offs, and address spillovers/leakage across sectors, levels of government, and timescales.

Operationally, the project applies the tools STAP highlights for coherence at the project/country level: scenario planning, policy screening to avoid negative spillovers, whole-of-government coordination, and knowledge loops, so global environmental benefits aren't undermined by misaligned policies. By aligning financing and incentives (e.g., O&M budgeting for the lab/BCH, modest cost-recovery, and targeted co-financing) and by continuously capturing lessons through the BCH Knowledge Hub, Yemen reduces the risk of leakage (e.g., unsafe LMO flows) and accelerates compliance at lower cost. In short, the project translates STAP's objectives - greater integration for higher ambition and durability through minimized spillovers - into concrete biosafety governance, budgeting, and transparency mechanisms that can endure under fragile conditions.

Innovativeness, Potential for Transformation and Scaling Up

The project introduces several **innovative and transformative approaches** to biodiversity management in Yemen, including:

- **Lean, shock-tolerant NBF design:** A modular framework with scenario triggers (parliamentary windows vs. executive decrees; full lab vs. referral mode) will keep biosafety controls alive across fragility, reducing LMO spillover risks to wild relatives and agrobiodiversity even during disruptions;
- **Binding inter-agency MoU and joint SOPs:** Environment–Agriculture–Health–Customs–Standards will operate on one playbook (shared case log, chain-of-custody, decision templates), closing enforcement gaps that typically allow invasive/GM material to bypass controls;

- **"Screen-first, confirm-selectively" lab model:** A cost-efficient qPCR workflow with regional twinning delivers credible detection without chasing full accreditation upfront, bringing real bio-surveillance capacity online quickly for early warning of biodiversity-relevant gene flow;
- **Risk-based border triage with portable kits:** Field sampling calculators, barcoded evidence, and rapid screens at priority ports/land crossings create a practical first line of defense where biodiversity is most exposed to transboundary movement;

- **Low-bandwidth BCH Knowledge Hub:** Open-licensed Arabic/English toolkits, SRAC opinion digests, and non-confidential decisions will make biosafety evidence accessible, supporting informed participation and trust that's vital for behavior change in farming/seed systems.
- **Rumor-management and micro-learning:** WhatsApp/audio PSAs, myth-busters, and USSD/SMS tips will counter misinformation that often derails biodiversity-friendly regulation, ensuring communities back measures that prevent genetic erosion of local varieties.

The project has significant potential for **replication and scaling up** within Yemen and abroad:

- **Modular, scenario-ready design:** The project's "lean and shock-tolerant" NBF (legal package + inter-agency MoU + joint SOPs) can be rolled out to other ports, airports and key land crossings via a hub-and-spoke model (shared case log, duty officer roster, portable sampling kits), allowing quick replication as access and safety improves;
- **Toolkits and ToT cascade:** Open-licensed Arabic/English SOP bundles (border, lab, SRAC, BCH) and training-of-trainers enable ministries, universities, and port authorities to replicate drills and curricula without external consultants;
- **Affordable lab model:** The "screen-first, confirm-selectively" qPCR set-up plus referral/twinning to a regional reference lab is sized for Yemen's budgets; it can be cloned in a second public lab (e.g., university/AREA) to create redundancy and regional coverage;

- **Template legal-regulatory package:** The CPB-aligned bill, executive regulations, decision templates, and BCH disclosure formats are easily adapted in other MENA/Arab and Horn/Sahel countries facing similar capacity and access constraints;

Gender Equality and Empowerment

Gender equality is integral to a credible, durable biosafety system in Yemen. Women are key actors in household food safety, seed selection, small trade, and civil society; the project will therefore embed gender-responsive design across Components 1–3 and track progress through the M&E system. A multi-stakeholder gender analysis will be completed during PPG to identify barriers (e.g., mobility, safety, time burdens, access to information/finance) and inform a costed Gender Action Plan (GAP) with clear responsibilities and timelines. All participation and results will be sex-, age-, and disability-disaggregated, with zero-tolerance PSEA

provisions and a confidential GRM. The legal package and secondary regulations will be co-developed through consultations that target ≥40% women participants and emphasize representation from women's associations, traders, and academia. The National Biosafety Committee (NBC) and Scientific Risk Assessment Committee (SRAC) will be (re)constituted with ≥30% women members, transparent selection criteria, and induction on gender-responsive decision-making and risk communication. Regulatory impact and fiscal notes will include gender analysis (e.g., effects of labeling/inspection on women-led MSMEs), while the BCH will publish plain-language summaries to widen women's access to information.

The project reserves training slots for women (≥30% of Customs/Quarantine/Port Health officers trained; ≥1 woman among core lab staff), provides women-focused ToT cohorts and mentoring, and ensures safe, enabling conditions (appropriate PPE sizes, lactation/privacy policies, safe travel, scheduling around care responsibilities). Career pathways will be supported for women lab technicians, inspectors, and SRAC experts through twinning, proficiency testing, and scholarships for short courses. Awareness campaign content will be co-created with women leaders and delivered through channels women use most (community radio, WhatsApp voice notes, market-day briefings), with childcare-friendly event times, travel stipends where needed, and disability-aware formats. Dialogues and town halls will target ≥40% women and ≥30% youth, elevate women as trusted messengers, and include rumor-management that addresses gendered misinformation. Budget lines for women's leadership training, mentoring, and safe-participation measures will be integrated into the Resource Mobilization & Sustainability Plan to ensure these gains persist beyond the project.

Private Sector Role

The private sector is central to operationalizing Yemen's biosafety system, both as regulated actors and as co-investors in capacity, technology, and outreach. Key partners include seed and feed importers, food and beverage processors, retailers, customs brokers, shipping/logistics firms, accredited and commercial labs, ICT providers, agri-input suppliers, and chambers of commerce. Engagement will follow UNDP's Due Diligence on Private Sector Partnerships, with conflict-sensitive operations, anti-corruption, and PSEA safeguards.

The project will mobilize the private sector across policy, operations, and outreach by co-drafting and road-testing practical executive regulations, CPB Art.18 labeling rules, and joint SOPs with industry and brokers, while rewarding compliance via "Biosafety-Ready" recognition, BCH public registries, and green lane clearance. On capacity and technology, commercial labs and suppliers will support reagents, service contracts, and proficiency testing, with fee-for-service screening that sustains lab O&M and helps SMEs de-risk shipments. Companies can co-fund awareness through radio/telecom/retail channels, host port/market info days, and adopt codes of conduct for "no unknown GMO," accurate "may contain" declarations, and rapid cooperation on holds/recalls. Public–private partnerships will be formalized via MoUs, service-level agreements for lab upkeep, and voluntary port compacts, with modest cost-recovery keeping services predictable. Safeguards ensure open, transparent selection, fair pricing, grievance channels, and sex-disaggregated participation targets with safe-participation measures for women staff and MSMEs. For firms, predictable, rules-based clearance will reduce demurrage and spoilage; credible lab reports and BCH transparency improve market access and ESG standing; and clear SOPs lower seizure/reputation risks, collectively accelerating a shock-tolerant biosafety regime that protects agrobiodiversity, food safety, and Yemen's trading reputation.

Coordination and Cooperation with Ongoing Initiatives and Project.

Does the GEF Agency expect to play an execution role on this project?

No

If so, please describe that role here. Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing

According to the request by the Government (LoE), and Yemen's current operating environment including institutional fragmentation, constrained government execution capacity, and heightened fiduciary, access, and security constraints, the project is expected to be implemented and executed by the United Nations Development Programme (UNDP) under Direct Implementation Modality, and in line with the GEF's criteria for dual execution applicable to Fragile and Conflict-affected Situations (FCS) and/or post-natural disaster situations. The detailed execution architecture (including any specific responsible

parties, technical partners, and their contractual roles) will be elaborated and validated during PPG and reflected in the governance and implementation framework and submitted for Secretariat review and decision.

The project will both be implemented and executed by the United Nations Development Programme (UNDP) under Direct Implementation Modality, and in line with the GEF's criteria for dual execution applicable to Fragile and Conflict-affected Situations (FCS) and/or post-natural disaster situations.

The project will be implemented/executed in strong coordination and collaboration with other relevant programs and projects in the country and abroad to ensure (1) Resource Optimization, including funding, expertise, and manpower, to avoid duplication of efforts and obtain co-financing; (2) Knowledge and Experience Sharing to enhance the effectiveness of each project, leading to more innovative and well-rounded solutions; and (3) Synergy in objectives to amplify their impact, making it easier to achieve these shared objectives on a larger scale. Specifically, the project will directly collaborate with the following initiatives:

Other initiatives	Objective	Areas of collaboration with Yemen Biosafety project
UNEP/GEF project "Support to Preparation of the Fifth National Report on the Implementation of the Cartagena Protocol on Biosafety" (GEF ID 11907), 2025-2026	Assists ~105 Parties to prepare their Fifth National Biosafety Reports (Article 33)	By engaging in this project, Yemen can access technical guidance for reporting and share data on GMO management, ensuring Yemen meets its obligations under the Protocol and learns from other nations' experiences. Collaboration could include participating in regional training workshops and peer reviews of national biosafety progress. However, Yemen Biosafety project will be able only to use some lessons from the project as it starts in 2027.
GEF Biosafety Clearing House (BCH) Capacity Building Program (ongoing since 2005, including UNEP/GEF Biosafety Clearing House (BCH) Capacity-Building – Phase III (2016-2025)	The BCH Capacity Building program's objective is to ramp up and sustain Parties' effective participation in the Biosafety Clearing-House by (1) training key stakeholders to enter, manage, and use BCH information for decision-making; (2) establishing sustainable national procedures and in-country expertise; and (3) providing enabling IT/tools (hardware, software, e-learning) so countries can reliably register and access required biosafety data.	Yemen can learn from experience of UNEP/GEF Biosafety Clearing-House (BCH) capacity-building initiative (Phase III) which involves 76 countries globally. By tapping into BCH training materials and the virtual learning platform, the Yemen Biosafety Project can improve how Yemen shares and accesses biosafety information internationally. In the future (Phase IV) cooperation might involve attending BCH training sessions, ensuring Yemen's biosafety regulations, decisions, and GMO risk assessments are uploaded to the BCH, and adopting the common data standards developed by this global project.
UNEP/GEF regional project (GEF ID 10991) "Promoting the safe application of biotechnology through Multi-country Cooperation in the implementation of National Biosafety Frameworks in Asia" (2024-2027)	Objective: To strengthen institutional, human and regulatory capacities and promote multi-country cooperation for implementing National Biosafety Frameworks so LMOs are safely transferred, handled and used—aligning with CPB Articles 2.1, 14 and 22. The design has two parts: (1) a multi-country cooperation component to develop common, science-based approaches (risk assessment/management, monitoring, information-sharing); and (2) national components to operationalize each country's biosafety system (regulatory regime, decision-making, enforcement/monitoring, public awareness, and BCH participation)	The Yemen Biosafety Project can collaborate by exchanging knowledge with other Asian initiatives, for example, adopting the unified risk assessment protocols and tools developed and participating in joint workshops or online forums. Even if Yemen isn't an official member of the project, it can seek south-south cooperation by learning from these countries' experiences in regulatory setup, GMO monitoring, and public awareness campaigns.
FAO/GEF Project "Resilient and Sustainable Livelihoods for Rural Yemen" (GEF ID 10562), 2023-2030	This initiative works in biodiversity-rich areas (Socotra, Hawf, Dhamar) to mainstream biodiversity conservation and climate adaptation in agriculture, livestock, and fisheries	The Yemen Biosafety Project can collaborate with this initiative by ensuring that biosafety measures (e.g. safe use of biotech crops or biocontrol agents) are

Other initiatives	Objective	Areas of collaboration with Yemen Biosafety project
		integrated into livelihood activities. For example, if climate-resilient crop varieties or pest control methods are introduced, the Biosafety Project can help assess and manage any GMO-related risks, aligning conservation goals with biosafety regulations. Coordination could include sharing stakeholder networks, co-hosting farmer awareness workshops (so that communities understand both biodiversity and biosafety), and using the FAO project's field sites to pilot biosafety monitoring (such as checking for any unintended impacts of new technologies on local ecosystems).
One Health Pandemic Preparedness Project (2024–2027), financed by the Pandemic Fund	A major One Health program in Yemen is strengthening health security across human, animal, and environmental sectors, financed by the new Pandemic Fund with FAO, WHO, and UNICEF as implementers. This project aims to bolster Yemen's capacity to prevent and detect disease threats by improving surveillance, laboratories, and border quarantine facilities.	The Biosafety Project can work with this initiative by leveraging the upgraded lab infrastructure and trained personnel for environmental biosafety needs. For instance, the same laboratories enhanced for human/animal pathogen detection could also be equipped and trained to test for GMOs in crops or food. Likewise, the improved quarantine and border controls for diseases can be expanded to screen agricultural imports for unauthorized genetically modified seeds or invasive alien organisms. Collaboration might involve joint training on laboratory biosafety (since handling infectious agents and GMO samples both require strict protocols), sharing early warning systems (e.g. adding invasive pest or GMO incidents into surveillance reporting), and coordinating policy so that health security and biosafety regulations reinforce each other.

Core Indicators

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	500			
Male	500			
Total	**1000**	**0**	0	**0**

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

Indicator 11. People benefiting from GEF-financed investments disaggregated by sex (count): the project has a significant number of direct and indirect beneficiaries (GEF Core Indicator 11): Approximately 1,000 direct beneficiaries (>=40% are women) drawn

from regulators and stakeholders (NBC/SRAC members, EPA/BCH staff, laboratory technicians, and ~100 Customs/Quarantine/Port Health officers, plus additional inspectors and focal points) that will receive targeted training, equipment, SOPs, and clear mandates. They will benefit through enhanced skills and tools to assess LMOs, enforce biosafety decisions at borders, operate PCR-based detection, and keep the BCH updated, improving institutional performance and career prospects. At least 200,000 indirect beneficiaries (>=40% are women) reached via radio/social media/print/WhatsApp: consumers, farmers, traders, and communities around priority ports and markets, that will gain accurate biosafety information and safer supply chains. They benefit from reduced risks of unsafe GMO imports/releases, clearer grievance channels, and more predictable, rules-based trade that protects agrobiodiversity and food safety.

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Moderate	Climate risks can undermine the Yemen biosafety project's effectiveness, sustainability, and scalability. Sea-level rise, and more frequent/severe cyclones, floods, heatwaves, and droughts threaten coastal transport corridors and utilities that the project depends on, risking access closures at priority ports/airports and land borders, reoccurring power/water disruptions for the national GMO laboratory and training venues, cold-chain interruptions for reagents, and damage to equipment—delaying implementation and inflating costs. Mitigation Strategies: implement flexible, adaptive project management informed by ongoing climate risk assessments and monitoring; leverage existing datasets to track key indicators such as seasonal hazard forecasts and rainfall variability (national alerts), documented port/road downtimes along priority corridors, facility power-quality/uptime and lab temperature logs with auto-alerts, and sea-level/storm-surge trends from publicly available datasets; employ a diversified suite of continuity options (pre-position portable screening kits and spares at hub ports, validate multi-route logistics via Oman/Saudi corridors with buffer stocks and staggered deliveries, use modular e-learning and remote drills for Customs/Quarantine/Port Health, and harden the national lab with HVAC redundancy, UPS/generator and PV battery, surge protection, water-leak alarms to spread risk and boost operational resilience.
Environmental and Social	Moderate	Environmental & Social risks may affect delivery and durability of outcomes. Small-scale fit-outs for the national GMO detection laboratory and training venues can generate hazardous waste and e-waste; lab biosafety lapses (handling, storage, effluent) and OHS exposures are possible; road/port sampling activities may elevate community health & safety risks; and publication of decisions/test results raises data-privacy concerns. Socially, low awareness and trust, institutional fragmentation, and power imbalances can exclude women/youth and vulnerable groups from benefits and decision-making; contested enforcement at borders/markets (perceived trade impacts for seed/feed/food importers) can trigger grievances; and trainings/fieldwork carry SEA/SH risks in a fragile context with parallel authorities. Mitigation Strategies: apply UNDP/GEF safeguards via a project-wide ESMP and site-specific ESMPs where any works occur; adopt laboratory biosafety/biosecurity and waste management plans (chemical inventories;

		spill/leak procedures; segregation; licensed disposal; e-waste take-back; ventilation; autoclave/UV SOPs); enforce contractor/venue ESHS clauses, OHS training and PPE, Codes of Conduct and SEA/SH protocols; implement data-protection SOPs for BCH/communications with de-identified public summaries; deliver an inclusive Stakeholder Engagement Plan and Gender Action Plan with targets for women/youth (NBC, SRAC, trainings), accessibility measures, and a transparent GRM; schedule culturally appropriate, bilingual outreach to build trust and counter misinformation; and use conflict-sensitive implementation: MoUs across EPA, Agriculture, Health, Standards, Customs and academia; clear roles at priority ports/airports/land borders; and joint SOPs for sampling, chain-of-custody and communications—with monitoring and adaptive management throughout.
Political and Governance	Substantial	Political & Governance risks could slow or derail key milestones for Yemen's biosafety system. Protracted political fragmentation (dual authorities), dormant or under-resourced coordinating bodies (NBC/SRAC), and the absence of an enacted biosafety regulations create uneven mandates, approval bottlenecks, and inconsistent enforcement at borders and laboratories. Chronic budget constraints, staff turnover, and donor dependence further weaken continuity, data-sharing, and procurement—heightening the chance of delays, disputed decisions, and loss of stakeholder trust. Conflict and insecurity remain a cross-cutting risk, potentially restricting access to priority ports/airports/land borders, disrupting counterpart participation and decision-making, delaying procurement and logistics, and increasing duty-of-care and asset-security requirements for laboratory establishment, field sampling, and trainings. Mitigation Strategies: fast-track legal adoption and clarify mandates—update and submit one Biosafety regulations and guidelines with an adoption roadmap; formally reactivate the NBC and constitute the SRAC with TORs, quorum rules, and operating budgets; and sign an inter-agency MoU (EPA, Agriculture/PPQ, Health, YSMO, Customs, academia) that establishes joint referral/sampling SOPs and publishes non-confidential decisions to the BCH for transparency. Create a high-level Steering/Coordination mechanism to bridge parallel authorities, use written decision matrices and delegated authorities to reduce approval bottlenecks, and pilot/validate SOPs at priority ports/airports/land borders before national roll-out. Embed adaptive management via quarterly risk-log reviews (PIR), with governance KPIs and trigger points (e.g., NBC quorum met, instruments gazetted, BCH update cadence) to re-sequence activities when approvals lag. Pair governance reforms with capacity and resourcing—standardized training, succession planning, data-sharing dashboards—and adopt a Resource Mobilization & Sustainability Plan to fund O&M beyond the grant so new rules are actually enforceable. Implementation of access/security management and duty-of-care protocols (remote delivery triggers, corridor-based sequencing, security briefings, no-go rules, asset tracking/insurance where feasible, and contingency plans for temporary relocation of activities).

INNOVATION		
Institutional and Policy	Substantial	Institutional & Policy risks could stall legal adoption and leave the biosafety system only partially functional. Yemen's biosafety law has not been enacted; key bodies (NBC/SRAC) have been largely dormant; mandates are fragmented across EPA, Agriculture/PPQ, Health, YSMO and Customs; and the national BCH is outdated—creating uncertainty that draft laws/regulations and joint SOPs will be adopted, funded, and consistently applied across ports, labs, and agencies. This raises the chance of approval bottlenecks, uneven enforcement, and decisions that are not transparently recorded to the BCH. Mitigation Strategies: front-load a clear legal pathway—update and operationalize Biosafety implementing instruments (regulations, guidelines, SOPs) with an adoption roadmap; formally reactivate NBC and constitute SRAC with TORs, quorum rules, and operating budgets; and sign an inter-agency MoU (EPA, Agriculture, Health, YSMO, Customs, academia) with joint referral and sampling SOPs published to the BCH. Use iterative, multi-stakeholder consultations to build buy-in; pilot and validate SOPs at priority points of entry before national roll-out; and institutionalize decision matrices, chain-of-custody forms, and data-sharing dashboards to reduce person-dependence. Pair legal reforms with capacity and resourcing (lab setup, training, succession planning) and a Resource Mobilization & Sustainability Plan to fund O&M beyond the project. Track adoption/enforcement via a public BCH update cadence and periodic governance reviews, adjusting sequencing if approvals lag.
Technological	Substantial	Technological risks could limit reliability and scale if core systems underperform or fail in Yemen's context. The project depends on establishing a PCR-based national GMO detection lab in Aden, portable screening kits at points of entry, and an upgraded national BCH/IT workflow; yet gaps in electricity quality, equipment/reagent supply, connectivity, and technician depth mean assays, cold chain, LIMS/records, and e-learning may not function consistently. Hardware/software outages, calibration drift, expired reagents/controls, and weak data governance could produce inconclusive results, lost datasets, and interrupted services—slowing decisions and eroding trust. Mitigation Strategies: phase commissioning with validation panels and proficiency tests before full roll-out; specify vendor-agnostic equipment where feasible, with local service agreements, stocked critical spares/consumables, and calibration/QA logs; harden power (UPS + generator; consider PV-battery where feasible) and environmental controls for the PCR suite; deploy dual freezers (−20/−80 °C) with auto-alerts and maintain min. 3–6-month buffer stocks of key reagents/controls; implement simple LIMS/chain-of-custody forms with offline-first data capture, routine backups, and role-based access; standardize field sampling SOPs and kit QC at ports/airports/land borders; stand up BCH updates with a clear cadence and templated, de-identified public summaries; train and certify lab analysts and PoE officers with refresher cycles and remote modules to reduce person-

		dependence; and pilot at priority hubs (Aden/Mukalla/Al-Ghaydah; Al-Wadi'ah/Shahn) before scaling nationwide.
Financial and Business Model	Substantial	Financial & Business Model risks could stall delivery and undermine sustainability if funding flows or the cost base shift unfavorably. Yemen's biosafety work has depended almost entirely on external support, with near-zero domestic budget—so O&M for the PCR lab (reagents/controls, calibration, cold chain, generator fuel), refresh trainings, BCH hosting, and field kits may be underfunded once the grant closes. A large co-financing envelope must materialize and stay on schedule; yet donors in Yemen often prioritize life-saving aid, and corridor-by-corridor access can drive freight/insurance spikes, FX shocks, and delivery delays, inflating prices beyond contingencies. Fee-for-service testing and cost-sharing with universities are nascent, limiting self-financing options in the short term. Mitigation Strategies: run full life-cycle costing and ring-fence recurrent O&M budget lines (fuel, reagents, QA, IT) in EPA plans; adopt a Resource Mobilization & Sustainability Plan with named sources, multi-year tranche MoUs, and disbursement schedules; standardize equipment and sign framework agreements for reagents/parts with local spares buffers; maintain 3–6-month buffer stocks for critical consumables; include price/FX contingencies in budgets; explore modest revenue streams (certificates, inter-agency SLAs, university cost-sharing, regional twinning) while keeping services affordable; stagger procurement via diversified corridors (incl. Oman/Saudi routes) to manage logistics risk; and tie disbursements to milestones (lab validation, SOP adoption) to keep partners engaged.
EXECUTION		
Capacity	Substantial	Capacity for Implementation risks may slow delivery and reduce consistency of results. EPA's biosafety unit is under-staffed and under-resourced; NBC/SRAC have been largely dormant; quarantine/customs lack validated SOPs, routine training, and rapid tests; public health/agricultural labs have minimal GMO testing capacity; and the national BCH is outdated. Persistent staff turnover, weak inter-agency data sharing, tight budgets, and conflict-affected logistics further strain procurement, supervision, and timely reporting—raising the chances of slippage and uneven enforcement across ports and laboratories. (Assessed under Annex-10 "Capacity for Implementation" definition.) Mitigation Strategies: stand up an experienced PMU within EPA with clear TORs, delegated authorities, and an annual procurement/implementation calendar; reactivate NBC and constitute SRAC with operating budgets; implement a capacity-building plan for agencies and labs (sequenced trainings, SOPs, O&M manuals, certification and refresher cycles, succession planning); commission the PCR lab in Aden with validation panels and service agreements; equip priority points of entry with standardized kits/SOPs and run joint drills; formalize inter-agency MoUs (EPA, Agriculture/PPQ, Health, YSMO, Customs, academia) and data-sharing dashboards/BCH update cadence; use framework agreements and local spares buffers to reduce downtime; pilot at hub corridors

		(Aden/Mukalla/Al-Ghaydah; Al-Wadi'ah/Shahn) before scaling; and deploy a simple offline-first M&E system with escalation rules to keep schedule, budget, and results on track.
Fiduciary	Substantial	Fiduciary risks could affect value-for-money and compliance if procurement/financial controls are strained by Yemen's fragile operating context. A small vendor base for lab equipment/consumables, corridor-specific logistics, FX/shipping volatility, and dispersed implementation across ports and agencies increase risks of weak competition, price inflation, delays, documentation gaps, and exposure to ineligible costs, fraud, or collusion especially if segregation of duties and record-keeping are thin in the PMU. Mitigation Strategies: establish UNDP/GEF-compliant FM arrangements with clear roles, separation of functions, dual signatories, and ring-fenced project accounts; adopt a risk-based annual procurement plan with method/threshold controls, market-price checks, and framework agreements for critical reagents/spares; maintain standardized supporting documents, asset registers, and timely bank reconciliations in a centralized accounting system; require quarterly spot checks and independent annual audits; train PMU and implementing partners on FM/procurement, apply Codes of Conduct and conflict-of-interest disclosures, and keep a confidential grievance/whistleblowing channel; include price/FX contingencies and indexed pricing where feasible to manage volatility.
Stakeholder	Substantial	Stakeholder risks may dilute ownership and slow decisions if engagement is uneven or contested. Diverse actors: EPA (competent authority), Agriculture/PPQ, Health, YSMO, Customs, NBC/SRAC, universities/labs, seed/feed importers, farmer groups, consumer associations, NGOs, media, and development partners hold different incentives and influence. Low public awareness of biosafety and persistent misinformation heighten the chance of grievances (e.g., perceived trade impacts at borders), while access/power imbalances can sideline women, youth, and vulnerable groups from benefits and decision-making. These dynamics align with GEF's "Stakeholder" risk definition on participation, inclusion, and partnerships. Mitigation Strategies: implement a robust, gender- and youth-inclusive Stakeholder Engagement Plan that (i) maps supply chains and roles (EPA, Agriculture, Health, YSMO, Customs, NBC/SRAC, academia, private sector, CSOs), (ii) sets transparent criteria for site/beneficiary selection, participation targets, travel/accessibility support, and (iii) operates a simple bilingual GRM linked to timely feedback loops; publish non-confidential decisions/FAQs via the BCH to counter misinformation; formalize coordination through an inter-agency MoU and joint SOPs for referrals, sampling, and communications; partner with trusted intermediaries (farmer associations, chambers, universities, local radio/WhatsApp networks) to reach remote groups; and track engagement quality and benefit equity with social-monitoring dashboards for adaptive course correction

Other	Substantial	Other risks sit outside the main categories but could still disrupt delivery. External shocks, public-health emergencies (e.g., cholera/dengue/COVID), regional shipping or fuel disruptions, sudden price/FX spikes, and corridor/port slowdowns, can halt travel, delay imports of equipment/consumables, and push costs beyond contingencies. In Yemen's "patchwork access" and "protracted fragmentation" scenarios, mobility depends on corridor-by-corridor deals and ports may see intermittent closures or throughput limits, amplifying volatility for schedules and budgets. Mitigation Strategies: adopt business-continuity planning with flexible sequencing and remote/online options; diversify procurement and routes (pre-arranged contracts via Oman/Saudi corridors), maintain buffer stocks of critical reagents/consumables and spares; include price/FX contingencies; pre-plan alternative venues and training modalities; cross-train staff and line up surge support to cover absences; and use proactive risk communication with clear incident protocols to sustain trust during disruptions.

Overall Risk Rating	Substantial	The project will be monitored quarterly by the PMU, MWE/EPA, and UNDP during PPG and implementation, with prompt corrective actions if any of the identified risks start materializing as threats to project development or implementation. This aligns with the Annex 10 template language and the project's plan for quarterly learning/risk-log reviews under M&E.

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Describe how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how. (max. 500 words, approximately 1 page)

The project's comprehensive approach is well-aligned with the Objective 2 of GEF BD FA, GBF Targets, SDGs, country priorities.

Project alignment with the GEF-8 Biodiversity Objective 1

Focal Area	Focal Area Objective	Contribution to the Objective
Biodiversity	Objective 2. To effectively implement the Cartagena and Nagoya protocols (Goals A, B and C of the GBF)	By adopting and enforcing the Biosafety regulations and guidelines, re-establishing the NBC/SRAC, operationalizing a national GMO lab, training border officers, and activating the BCH and public awareness/dialogues, the project enables Yemen to assess, monitor, and regulate LMOs in line with the Cartagena Protocol—reducing biosafety risks and supporting GBF Goals A and B.

Project contribution to GBF Targets

Target	Contribution to the target
Target 17 - Biosafety & biotechnology	The project updates and operationalizes biosafety regulations and additional instruments, re-establishes NBC/SRAC, equips a national GMO lab, and trains border officers so Yemen can assess, approve, and monitor LMOs in line with the Cartagena Protocol
Target 20 – Capacity building & cooperation	The project builds sustained national capacity for risk assessment, detection, enforcement, and biosafety management (lab systems, SOPs, trained cadres), with a Resource Mobilization & Sustainability Plan to maintain capabilities
Target 21 – Knowledge Sharing & Data Accessibility	The project upgrades the national Biosafety Clearing House and produces open knowledge products (SOPs, curricula, decision templates) to ensure timely, science-based information flows into biosafety policy and practice
Target 22 – Inclusive & Equitable Biodiversity Governance	The project runs a nationwide, low-bandwidth awareness campaign and multi-stakeholder dialogues to secure inclusive, informed public participation in biosafety decision-making
Target 23 - Gender Equality and a Gender-Responsive Approach for Biodiversity Action	The project embeds gender targets and actions for women participation in NBC/SRAC, trainings, and awareness campaign, and has gender-responsive M&E, so women equitably shape and benefit from biosafety governance.

Project contribution to SDGs

SDG	Direct contribution
SDG 3 (Good Health and Well-being)	Establishing risk-assessment procedures, a national GMO detection lab, and risk communication reduces potential human health risks from unsafe LMO handling and use.
SDG 9 (Industry, Innovation and Infrastructure)	The project creates core scientific and regulatory infrastructure (PCR lab, SOPs, trained cadres) to oversee biotechnology safely and support innovation.
SDG 12 (Responsible Consumption and Production)	Traceability, documentation verification, and inspection protocols at borders and markets promote safe, transparent value chains for GMO-derived products.
SDG 15 (Life on Land)	Operational LMO risk assessment, decision-making, and monitoring reduce biosafety risks to terrestrial biodiversity and agrobiodiversity.
SDG 17 (Partnerships for the Goals)	Upgrading the BCH, sharing knowledge products, and linking to the Arab Region biosafety network and global BCH deepen cooperation, data exchange, and resource mobilization.

Project contribution to the national environmental and development priorities

Priorities	Contribution
NBSAP III (2025–2030)	NBSAP's Pathway 6 Target 15 (biosafety): the project's operationalization of biosafety regulations and guidelines, re-activation of NBC/SRAC, PCR lab set-up, border screening and public risk-communication operationalize NBSAP III's call to "train…strengthen monitoring and oversight of the transportation, handling and use of GMOs…in line with the Cartagena Protocol."
National Strategy for Environmental Sustainability 2005–2015	The project strengthens the legal/institutional machinery for biodiversity protection and environmental governance through enforceable biosafety regulations, SOPs, and coordination.

National Food Security Strategy (2011)	The project supports safe agri-food systems by enabling evidence-based LMO decisions and risk-based border controls that protect seed systems and food imports
National Agriculture & Fisheries Investment Plan / NAFSIP 2024–2030 (draft):	The project complements sector investments with biosafety testing, surveillance and trained cadres at points of entry to keep markets open and resilient.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

We confirm that gender dimensions relevant to the project have been addressed as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

Stakeholder Engagement

We confirm that key stakeholders were consulted during PIF development as required per GEF policy, their relevant roles to project outcomes and plan to develop a Stakeholder Engagement Plan before CEO endorsement has been clearly articulated in the Project Description (Section B).

Yes

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities: Yes

Civil Society Organizations: Yes

Private Sector: Yes

Provide a brief summary and list of names and dates of consultations

Key consultations for the PIF development

Name of the expert/ institute	Description	Date
- Mr. Abdul-Hakim Aulaiah Deputy Minister for Environment Convention Focal Point for UNCBD - Mr. Faisal Al-thalabi GEF National Operational Focal Point - Yemen Acting Chairman of Environment Protection Authority	Discussion on the context of Biosafety in Yemen including the commitments to Cartagena Protocol, the process of the endorsement of National Biosafety Framework, potential stakeholders of the project, consultations with different government authorities and centers on the importance of the acceleration of the implementation of the national biosafety framework, and the institutional needs for the effective execution of the National Biosafety Framework.	August 24, 2025

- Ms. Sara Turkey National Focal Point for Cartagena Protocol on Biosafety		
1st Steering Committee Meeting for the Projects on NBSAP Update and 7th National Report and Developing the Biodiversity Finance Plan. Representation includes: Cabinet of Yemen. Ministry of Water and Environment and its affiliated authorities including Environment Protection Authority. Ministry of Planning and International Cooperation. Ministry of Agriculture, Irrigation, and Fisheries and its affiliated authorities including Marine Science and Biological Research Authority. Ministry of Finance. NGOs: Istidama for Nature Conservation. Private sector: Federation of Yemen Chambers of Commerce and Industry and Hayel Saeed Anam Group. Academia and Research Institutes: University of Taiz. Other Governmental authorities: Central Statistical Organization, General Investment Authority, Yemen Customs Authority. Women associations represented by Women National Committee and Yemeni Women's Union.	The meeting included a discussion on the initiation of this project and its alignment with the recently updated NBSAP, focusing on national priorities such as Target 15 on biosafety. The Deputy Minister of Environment clarified that the National Target 15 aims to train and enhance the competence of all relevant stakeholders in biosafety measures, which is consistent with Target 17 of the KM-GBF. The latter emphasizes establishing and strengthening capacity for implementing biosafety measures, as outlined in Article 8(g) of the Convention on Biological Diversity, as well as measures for the handling of biotechnology and the equitable distribution of its benefits, as specified in Article 19 of the Convention.	August 27,2025

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in the section B project description?

Yes

Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)
UNDP	GET	Yemen	Biodiversity	BD STAR Allocation: BD-1	Grant	1,007,867.00	95,747.00	1,103,614.00
Total GEF Resources ($)						**1,007,867.00**	**95,747.00**	**1,103,614.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

50000

PPG Agency Fee ($)

4750

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)
UNDP	GET	Yemen	Biodiversity	BD STAR Allocation: BD-1	Grant	50,000.00	4,750.00	54,750.00
Total PPG Amount ($)						**50,000.00**	**4,750.00**	**54,750.00**

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
UNDP	GET	Yemen	Land Degradation	LD STAR Allocation	1,158,364.00
Total GEF Resources					**1,158,364.00**

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
BD-1-1	GET	1,007,867.00	3850000
Total Project Cost		**1,007,867.00**	**3,850,000.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministries (of Water & Environment and Agriculture)	In-kind	Recurrent expenditures	250000
GEF Agency	UNDP	Grant	Investment mobilized	100000
Donor Agency	Federal Government of Germany	Grant	Investment mobilized	2000000
Donor Agency	Government of Japan	Grant	Investment mobilized	1500000
Total Co-financing				**3,850,000.00**

Describe how any "Investment Mobilized" was identified

The Recipient Country Government (Government of Yemen), represented by the Ministry of Water and Environment and the Ministry of Agriculture, Irrigation, and Fisheries, will contribute in-kind support valued at $250,000. This support will encompass stakeholders' coordination, facilitation of policy development and implementation, and securing critical regulatory approvals for the relevant activities under the project.

The United Nations Development Programme (UNDP) is expected to mobilize $100,000 through a grant from its core resources. Additional co-financing includes $2,000,000 from the Federal Government of Germany under the Integrated Water Resources Management to Enhance Resilience of Agriculture (ERA) and Food Security project, and $1,500,000 from the Government of Japan under an ongoing project to improve the efficiency of the Port of Aden.

The total co-financing for the project amounts to $3,850,000, demonstrating a collaborative effort to achieve its objectives.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

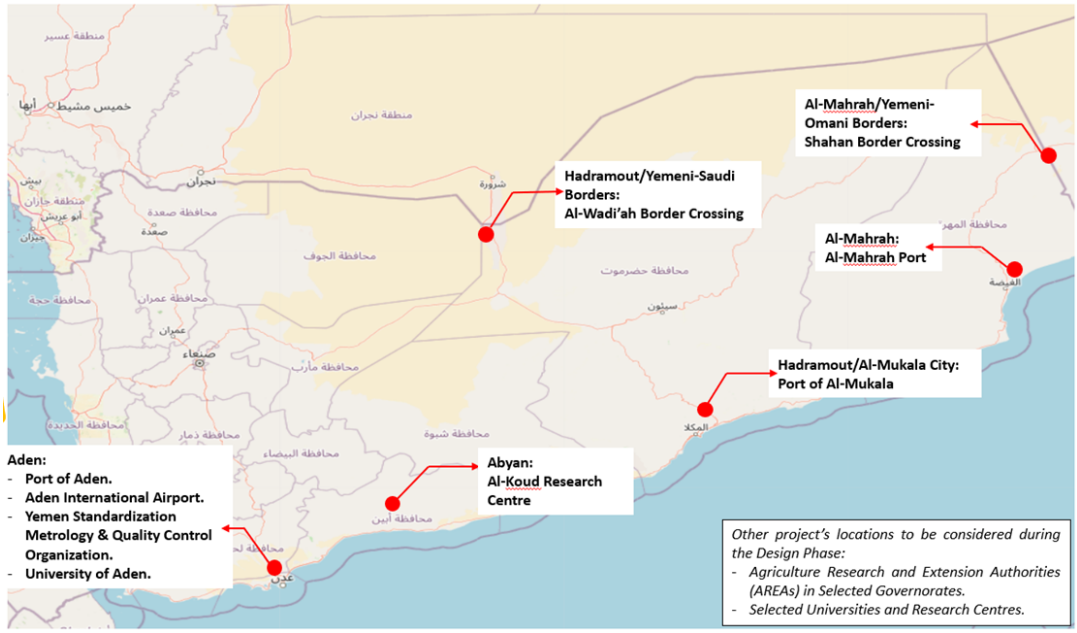
GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Nancy Bennet	12/22/2025			nancy.bennet@undp.org
Project Coordinator	Min Htut Yin	12/22/2025			min.htut.yin@undp.org

Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Name	Position	Ministry	Date (MM/DD/YYYY)
Mr. Faisal Al Thalabi	Acting Chairman of Environment Protection Authority	Ministry of Water and Environment	11/26/2025

ANNEX C: PROJECT LOCATION

Please provide geo-referenced information and map where the project interventions will take place



Project site coordinates in decimal degrees, WGS 1984 datum

Site	Longitude	Latitude
Port of Aden	44.98550	12.79120
Aden International Airport	45.02889	12.82944
Yemen Standardization Metrology & Quality Control Organization	45.0003	12.8383
University of Aden	45.028503	12.789585
Port of Mukalla	49.15140	14.52030
Nishtun (Nashtoon) Port (Al-Mahrah)	52.19694	15.82028
Al-Koud Research Center	45.381207	13.128581
Al-Wadi'ah Border Crossing (Saudi Arabia)	47.01767	16.95717
Shahn/Shehn (Shahan) Border Crossing (Oman)	52.54670	17.79930

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title
YEM_PIMS_10419_ SESP Biosafety_PIF stage_26Feb2026

ANNEX E: RIO MARKERS

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
No Contribution 0	No Contribution 0	Principal Objective 2	No Contribution 0

ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
Influencing models			
	Transform policy and regulatory environments		
	Strengthen institutional capacity and decision-making		
	Convene multi-stakeholder alliances		
	Demonstrate innovative approaches		
	Deploy innovative financial instruments		
Stakeholders			
	Indigenous Peoples - IPLC		
	Private Sector		
		Capital providers	
		Financial intermediaries and market facilitators	
		Large corporations	
		SMEs	
		Individuals/Entrepreneurs	
		Non-Grant Pilot	
		Project Reflow	
	Beneficiaries		
	Local Communities		
	Civil Society		
		Community Based Organization	
		Non-Governmental Organization	
		Academia	
		Trade Unions and Workers Unions	
	Type of Engagement		
		Information Dissemination	
		Partnership	
		Consultation	
		Participation	
	Communications		
		Awareness Raising	
		Education	
		Public Campaigns	
		Behavior Change	
Capacity, Knowledge, and Research			
	Enabling Activities		
	Capacity Development		
	Knowledge Generation and Exchange		
	Targeted Research		
	Learning		
		Theory of Change	
		Adaptive Management	
		Indicators to Measure Change	
	Innovation		
	Knowledge and Learning		
		Knowledge Management	
		Innovation	
		Capacity Development	
		Learning	
	Stakeholder Engagement Plan		
Gender Equality			
	Gender Mainstreaming		
		Beneficiaries	
		Women groups	
		Sex-disaggregated indicators	
		Gender-sensitive indicators	
	Gender results areas		
		Access and control over natural resources	
		Participation and leadership	
		Access to benefits and services	
		Capacity development	
		Awareness raising	
		Knowledge generation	
Focal Areas/Theme			

Integrated Programs		
	Commodity Supply Chains (Good Growth Partnership)	
		Sustainable Commodities Production
		Deforestation-free Sourcing
		Financial Screening Tools
		High Conservation Value Forests
		High Carbon Stocks Forests
		Soybean Supply Chain
		Oil Palm Supply Chain
		Beef Supply Chain
		Smallholder Farmers
		Adaptive Management
	Food Security in Sub-Sahara Africa	
		Resilience (climate and shocks)
		Sustainable Production Systems
		Agroecosystems
		Land and Soil Health
		Diversified Farming
		Integrated Land and Water Management
		Smallholder Farming
		Small and Medium Enterprises
		Crop Genetic Diversity
		Food Value Chains
		Gender Dimensions
		Multi-stakeholder Platforms
	Food Systems, Land Use and Restoration	
		Sustainable Food Systems
		Landscape Restoration
		Sustainable Commodity Production
		Comprehensive Land Use Planning
		Integrated Landscapes
		Food Value Chains
		Deforestation-free Sourcing
		Smallholder Farmers
	Sustainable Cities	
		Integrated urban planning
		Urban sustainability framework
		Transport and Mobility
		Buildings
		Municipal waste management
		Green space
		Urban Biodiversity
		Urban Food Systems
		Energy efficiency
		Municipal Financing
		Global Platform for Sustainable Cities
		Urban Resilience
Biodiversity		
	Protected Areas and Landscapes	
		Terrestrial Protected Areas
		Coastal and Marine Protected Areas
		Productive Landscapes
		Productive Seascapes
		Community Based Natural Resource Management
	Mainstreaming	
		Extractive Industries (oil, gas, mining)
		Forestry (Including HCVF and REDD+)
		Tourism
		Agriculture & agrobiodiversity
		Fisheries
		Infrastructure
		Certification (National Standards)
		Certification (International Standards)
	Species	
		Illegal Wildlife Trade
		Threatened Species

		Wildlife for Sustainable Development
		Crop Wild Relatives
		Plant Genetic Resources
		Animal Genetic Resources
		Livestock Wild Relatives
		Invasive Alien Species (IAS)
	Biomes	
		Mangroves
		Coral Reefs
		Sea Grasses
		Wetlands
		Rivers
		Lakes
		Tropical Rain Forests
		Tropical Dry Forests
		Temperate Forests
		Grasslands
		Paramo
		Desert
	Financial and Accounting	
		Payment for Ecosystem Services
		Natural Capital Assessment and Accounting
		Conservation Trust Funds
		Conservation Finance
	Supplementary Protocol to the CBD	
		Biosafety
		Access to Genetic Resources Benefit Sharing
Forests		
	Forest and Landscape Restoration	
		REDD/REDD+
	Forest	
		Amazon
		Congo
		Other Critical Forest Biomes
		Drylands
Land Degradation		
	Sustainable Land Management	
		Restoration and Rehabilitation of Degraded Lands
		Ecosystem Approach
		Integrated and Cross-sectoral approach
		Community-Based NRM
		Sustainable Livelihoods
		Income Generating Activities
		Sustainable Agriculture
		Sustainable Pasture Management
		Sustainable Forest/Woodland Management
		Improved Soil and Water Management Techniques
		Sustainable Fire Management
		Drought Mitigation/Early Warning
	Land Degradation Neutrality	
		Land Productivity
		Land Cover and Land cover change
		Carbon stocks above or below ground
	Food Security	
International Waters		
	Ship	
	Coastal	
	Freshwater	
		Aquifer
		River Basin
		Lake Basin
	Learning	
	Fisheries	
	Persistent toxic substances	
	SIDS : Small Island Dev States	
	Targeted Research	

	Pollution	
		Persistent toxic substances
		Plastics
		Nutrient pollution from all sectors except wastewater
		Nutrient pollution from Wastewater
	Transboundary Diagnostic Analysis and Strategic Action Plan preparation	
	Strategic Action Plan Implementation	
	Areas Beyond National Jurisdiction	
	Large Marine Ecosystems	
	Private Sector	
	Aquaculture	
	Marine Protected Area	
	Biomes	
		Mangrove
		Coral Reefs
		Seagrasses
		Polar Ecosystems
		Constructed Wetlands
Chemicals and Waste		
	Mercury	
	Artisanal and Scale Gold Mining	
	Coal Fired Power Plants	
	Coal Fired Industrial Boilers	
	Cement	
	Non-Ferrous Metals Production	
	Ozone	
	Persistent Organic Pollutants	
	Unintentional Persistent Organic Pollutants	
	Sound Management of chemicals and Waste	
	Waste Management	
		Hazardous Waste Management
		Industrial Waste
		e-Waste
	Emissions	
	Disposal	
	New Persistent Organic Pollutants	
	Polychlorinated Biphenyls	
	Plastics	
	Eco-Efficiency	
	Pesticides	
	DDT - Vector Management	
	DDT - Other	
	Industrial Emissions	
	Open Burning	
	Best Available Technology / Best Environmental Practices	
	Green Chemistry	
Climate Change		
	Climate Change Adaptation	
		Climate Finance
		Least Developed Countries
		Small Island Developing States
		Disaster Risk Management
		Sea-level rise
		Climate Resilience
		Climate information
		Ecosystem-based Adaptation
		Adaptation Tech Transfer
		National Adaptation Programme of Action
		National Adaptation Plan
		Mainstreaming Adaptation
		Private Sector
		Innovation
		Complementarity
		Community-based Adaptation
		Livelihoods
	Climate Change Mitigation	
		Agriculture, Forestry, and other Land Use
		Energy Efficiency
		Sustainable Urban Systems and Transport

	Technology Transfer Renewable Energy Financing Enabling Activities
Technology Transfer	Poznan Strategic Programme on Technology Transfer Climate Technology Centre & Network (CTCN) Endogenous technology Technology Needs Assessment Adaptation Tech Transfer
United Nations Framework on Climate Change	Nationally Determined Contribution