愛女孩國際關懷協會

水資源白皮書

Building Water Systems That Last

在資源有限、環境不確定的情況下，我們如何做選擇、如何承擔風險，以及您的捐款如何被納入一個可被監督與修正的制度之中。

Love Binti International | 2025

目錄

第一部：承諾與原則

推薦閱讀對象

本白皮書專為關心長期影響力、制度責任與資源效益的支持者所撰寫。

如果您希望了解「多年後水井是否仍在運作」，這份文件正是為您而設。

這份文件適合：

- **個人捐款人：**希望捐款形成穩定公共效益
- **企業 CSR/ESG 團隊：**需要治理邏輯與可追溯性
- **基金會與機構型捐助者：**需要清楚決策依據與長期承諾

如果您想了解：

- 多年後這口水井是否仍在運作？
- 為什麼有些看似迫切的需求會被拒絕？
- 當事情不如預期時，誰負責什麼？

「只要挖到水就好了，對吧？」這是我們最常被問到的問題。

但在東非工作多年後，我們學到：找到水往往只是問題的開始。真正決定影響力能否延續的，是治理結構、使用行為與責任歸屬。

本白皮書不是什麼：不是技術手冊、不是募款文件、不是成果展示報告。

這是一份決策透明說明書，說明我們如何做選擇、承擔風險，以及捐款如何被納入可監督與修正的制度。

核心差異：建立可信賴的系統

多數水資源專案將「成功」定義為工程完成的那一天。

然而，我們確認：五年後水資源是否仍被安全使用，才是真正的關鍵。

傳統方法 vs. 系統型方法：

傳統方法	系統型方法
完成一口水井	建立水資源治理系統
工程完成即交付	五年追蹤承諾
單點解決方案	多元水源組合降低風險
以需求急迫性排序	以可持續性與風險評估
責任止於完工	責任延伸至工程之後

【案例對比】

案例 A：某組織在 A 社區鑽井成功。兩年後因管理不清、取水點污染，社區重回不安全水源。

案例 B：我們在 B 社區花三個月進行評估與協調，選擇手動水井加雨水收集。五年後仍穩定運作。

差異關鍵：不是工程技術，而是前期判斷、責任設計與長期追蹤。

氣候變遷如何改變遊戲規則

過去水資源專案建立在自然條件穩定的假設上。氣候變遷正在改變這項前提。

氣候變遷的真實影響：

- **降雨更極端：**暴雨與乾旱交替
- **乾季拉長：**淺層水源更容易枯竭
- **地下水補注被打亂：**經驗法則不再可靠
- **污染風險改變：**極端降雨增加污染進入水源機率

當水井停止運作，多數人歸因於設備或維修不足。

但在氣候風險下，更多失效源於治理與系統設計缺位。工程完成不等於風險消失。

我們的回應：

- 評估時納入氣候不穩定性的長期影響
- 不以過往經驗套用於已改變的環境
- 透過多元水源組合降低單點失效風險

五年追蹤與責任邊界

多數水資源專案責任止於工程完成。我們選擇延伸至工程之後，提供五年追蹤。

追蹤的意義：不是保證水井永久運作，而是確保專案被持續關注。

我們追蹤什麼：

- 水源使用狀況與基本功能
- 管理結構是否持續運作
- 外在條件是否顯著變化
- 水質安全是否維持

責任邊界：

我們做什麼	我們不做什麼
前期地質探勘與風險判斷	日常營運管理
專案設計與系統規劃	承擔所有維修成本
合作協調與品質監督	保證永久運作
五年制度性追蹤	取代政府職責

服務對象選定

水資源需求普遍迫切，但「需求存在」不等於「適合立即介入」。

選定是結合公共衛生、地質風險與治理可行性的綜合決策。

評估三大面向：

1. **公共健康風險：**水資源不足是否造成實質健康風險
2. **地質與氣候可行性：**前期探勘是否顯示基本可行
3. **治理與管理能力：**社區是否有最低限度協作能力

【真實案例：我們拒絕的提案】

C 社區需求極迫切，兒童每天步行 3 小時取水。

但地下水層超過 150 米、成本極高、社區派系對管理權長期爭議。

決定：暫緩介入，先建立雨水收集與治理能力。這不是放棄，而是負責任的延後。

第二部：我們如何工作

服務項目總覽

沒有單一水資源方案能適用所有情境。我們依據條件配置不同服務。

類型	適用情境	深度	核心價值
手動水井	電力不穩、維修有限	20-60m	低門檻、長期穩定
太陽能水井	高需求、人口集中	60-120m	供水量大、低運行成本
雨水收集	降雨季節明顯	-	輔助水源、非飲用
水井維修	既有失修水井	-	高性價比、快速恢復

【策略性組合：D 小學】

主要水源：太陽能深井。輔助水源：雨水收集。備援：鄰近手動井。

即使一項系統故障，學校仍有基本用水保障。

地質測量與風險判斷

地質測量是最關鍵的前期工作。氣候變遷下，經驗法則已不足以支撐長期可用性。

風險等級	判斷依據	行動
低風險	地質明確、經驗充足	初步探勘即可判斷
中風險	含水層位置不確定	啟動專業地質測量
高風險	地質複雜、氣候極端	完整評估或不介入

核心目的：不在保證出水，而在清楚界定成功機率與風險邊界。

選址原則

選址同時考量三個面向：地質條件、公共可及性、管理可行性，缺一不可。

1. **地質條件：**含水層深度、長期產量、季節變化風險
2. **公共可及性：**是否公共用地、取水動線、受益人口
3. **管理可行性：**責任主體、維護資源、規則執行

【案例：放棄完美地質條件】

E 村地質優異，35 米可達含水層。但村內三個家族對用地長期爭議。

決定：拒絕鑽井。因為工程完成後將陷入管理真空。

手動水井設計

在電力不穩、維修有限的地區，手動水井是最可靠的選擇。

核心價值：

- **可理解：**社區能理解運作原理
- **可操作：**不需外部技術
- **可管理：**維修門檻低
- **可持續：**不依賴電力

設計面向	做法
鑽井深度	20-60 米，以穩定性為優先
井口保護	混凝土井台、排水坡度、加蓋
幫浦選型	在地可維修機型、零件標準化
衛生設計	取水點硬化、排水溝、防牲畜

五年存活率：78%（極乾旱地區）。多數 5-10 年仍保持功能。

太陽能水井與雨水收集

學校、醫療站等高需求場域，單一手動井無法滿足穩定供水。

元件	功能
深層鑽井	60-120 米，更穩定含水層
太陽能抽水	不依賴電網，運行成本低
儲水設施	確保夜間與陰天供水
管線配置	多個取水點，降低擁擠

雨水收集：輔助性水源，主要承擔非飲用用途，降低地下水井壓力。

水井維修：成本效益遠高於新建，通常節省 70-85%。

鑽井深度與水量評估

「鑽得越深、水越多」是常見但危險的迷思。我們以長期穩定產量為核心指標。

過度鑽深的風險：

- **成本急增：**每增 10 米可能增加 20-30% 成本
- **破壞水平衡：**過度抽取導致水位下降
- **維護難度高：**深井故障率更高

【案例：拒絕「更深」】

F 社區 45 米已達每小時 800 公升。施工單位建議繼續至 80 米。

決定：停在 45 米。三年後最乾旱季仍維持 600 公升以上。

水質安全與公共衛生

水的存在不等於水的安全。水質未確認，仍可能對健康造成風險。

水質評估：

1. **區分用途：**飲用水必須通過檢測
2. **持續監測：**初期、雨季、乾季各一次；異常時立即檢測

取水點設計與防污染

即使地下水安全，水仍可能在取水過程中受污染。

問題	解決方案
積水回流	地面硬化、排水坡度
牲畜進入	圍欄、動物飲水點另設
容器不潔	取水平台、洗手設施
異物落入	井口加蓋上鎖

【案例：取水點改造】

G 診所水質良好但兒童腹瀉率高。原因：取水點積水泥濘。

改善後三個月，腹瀉率下降 60%。成本不到原水井 5%。

社區用水行為與衛生教育

影響最深遠的因素往往不是設備，而是人的行為。

即使工程完善，若用水方式未被納入設計，水井仍可能提前失效。

整合進生計計畫：

1. **農業計畫：**用水管理直接影響作物健康
2. **布衛生棉計畫：**讓婦女連結清潔用水與衛生安全

透過跨領域協作，水資源捐款在社區多個層面產生長期效果。

第三部：治理架構與責任

利害關係人角色

長期可行性取決於各方角色被正確理解與定位。我們清楚界定責任邊界。

角色	主要責任	不負責
捐款人	支持具風險判斷能力的系統	工程細節、日常營運
愛女孩國際關懷協會	前期探勘、專案設計、五年追蹤	日常營運、取代政府
在地合作單位	需求溝通、日常管理、基本維護	專案設計、重大維修
技術夥伴	地質測量、鑽井施工	專案決策、長期管理

專案評分與排序

資源有限，「先做哪個」本身即是責任。我們建立可被檢視的評分邏輯。

指標	權重	評估內容
公共衛生風險	30%	水源性疾病發生率
地質水文可行性	25%	含水層穩定性、施工可行性
氣候穩定性	20%	季節變化風險
社區治理能力	15%	管理責任主體
長期影響力	10%	受益人口、示範效果

【評分運作案例】

I 社區：公衛風險高（9/10），但地質可行性低（4/10），綜合 5.3/10

J 學校：各項均中高（6-9/10），綜合 7.9/10

決策：優先 J 學校，同時啟動 I 社區治理能力建設。

供應商合作：雙軌制

單一供應商不足以承擔全部風險。我們採顧問與在地工程雙軌合作。

軌道	角色	責任
第一軌	水文地質專家	地質測量、風險評估、選址建議
第二軌	在地鑽井團隊	實際施工、設備安裝

線上登錄與透明

我們建立線上登錄，記錄專案從申請到追蹤的完整歷程。

階段	記錄內容
專案申請	需求描述、初步探勘、是否進入評估
專案評分	五大指標明細、綜合評分、延後或拒絕原因
專案執行	選址、鑽井深度、水質檢測、完工日期
五年追蹤	定期檢視、問題回報、維修記錄

您支持的專案不會在完工後消失。每項決策都有可回溯依據。

風險控管

水資源專案無法保證零失敗。我們預設問題可能發生，提前設計回應機制。

類型	特徵	回應
可修復技術問題	設備老化、零件損壞	啟動維修評估
管理問題	使用衝突、管理真空	協調與重啟教育
結構性失效	地質條件改變	記錄原因、終止建議

【案例：面對失敗】

K 社區水井第三年出水量驟降。原因：連續兩年極端乾旱。

回應：誠實向捐款人報告、評估補救措施、納入未來評分調整。

五年追蹤機制

對每項水資源介入提供至少五年制度性追蹤。

階段	頻率	重點
Year 1-2 密集追蹤	每 3 個月	初期問題、管理建立
Year 3-4 穩定觀察	每 6 個月	長期穩定性、季節變化
Year 5 評估決策	完整評估	是否繼續、經驗總結

五年之後：

- **穩定運作：**記錄為成功案例
- **需持續關注：**評估延長追蹤

- **已失效：**誠實記錄原因，回饋未來決策

第四部：成果與合作

案例摘要

我們從系統運作角度檢視成果，而非僅計算「完成幾口水井」。

案例 1：L 偏遠社區

背景：山區村落，約 350 人

選擇：手動井 + 取水點防污染 + 整合婦女農業計畫

五年結果：

- 出水量穩定維持每小時 600 公升
- 社區自行完成 3 次維修
- 兒童腹瀉率下降 65%

案例 2：M 小學

背景：600 名學生，市政供水不穩

選擇：太陽能深井 + 雨水收集 + 分流管理

五年結果：

- 雨水系統降低深井壓力 40%
- 水源性疾病病假下降 70%
- 五年故障天數僅 8 天

案例 3：N 診所

背景：衛生所水井失修 3 年

選擇：維修復能 + 取水點升級 + 衛生教育

成本：$1,200 vs. 新建 $8,500（節省 86%）

結果：功能恢復、腹瀉就診下降 55%、800 人受益

影響力衡量

影響力若停留在輸出指標，無法反映真實改變。我們從「做了什麼」轉向「改變了什麼」。

傳統輸出指標	結果指標
建置 X 口水井	X% 社區獲得穩定安全水源
鑽井深度 X 米	乾季產量維持 X 公升/小時
服務 X 人口	水源性疾病下降 X%
設備運作 X 年	5 年後仍功能正常比例 X%

可複製性與擴展

「複製成功案例」常被誤解為複製工程設計。真正可複製的是判斷與決策邏輯。

不可複製	可複製
A 地鑽井深度直接套用 B 地	風險評估方法
C 社區管理模式強加 D 社區	決策邏輯與評分機制
雨季豐沛設計用於乾旱地區	治理架構與追蹤機制

捐款人指南

選項	適合對象	運作方式
支持整體系統	信任協會判斷	依評分機制分配
指定特定專案	希望深度參與	從通過評估的專案選擇
支持前期探勘	願意支持「看不見的工作」	支持地質探勘、風險評估
長期夥伴	企業/基金會	3-5 年合作框架

常見問題：

Q: 捐款多久能看到水井完成？

A: 手動井約 2-4 個月，太陽能系統約 6-9 個月。

Q: 為什麼前期探勘重要？

A: 它決定 90% 成功率。審慎選址失敗率低於 10%；未經評估可能達 60%。

結語

氣候變遷與社會變動，使水資源專案面臨前所未有的不確定性。

真正困難的不是找到水，而是做出負責任的選擇：何處介入、如何介入、何時不介入。

我們相信：

- 水資源不是一次性工程，而是需要耐心的公共投資
- 真正影響力在於五年後有多少仍穩定運作
- 誠實面對失敗比製造虛假成功更重要
- 捐款人值得一個會學習、會修正的夥伴

We don't just build wells. We build water systems people can trust.

Love Binti International 愛女孩國際關懷協會

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2025 愛女孩國際關懷協會

聯絡資訊

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文件版本：2.0 | 發布日期：July 2025

Love Binti International

Water Resources White Paper

Building Water Systems That Last

In a world of limited resources and environmental uncertainty, this document explains how we make decisions, how we manage risks, and how your donations are integrated into a system that can be monitored and improved.

Love Binti International | July 2025

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Part One: Commitments and Principles

Target Audience

This white paper is written for supporters who care about long-term impact, institutional accountability, and resource efficiency.

If you want to know whether wells are still working years later, this document is for you.

This document is for:

- **Individual donors:** Those who want donations to create lasting public benefit
- **Corporate CSR/ESG teams:** Those who need governance logic and traceability
- **Foundations and institutional donors:** Those who need clear decision criteria and long-term commitments

If you want to know:

- Will this well still be working years from now?
- Why are some urgent needs rejected?
- When things go wrong, who is responsible for what?

"Just find water, right?" This is our most common question.

After years of work in East Africa, we learned: finding water is often just the beginning. What determines lasting impact is governance structure, usage behavior, and accountability.

What this white paper is NOT: Not a technical manual, not fundraising material, not a showcase report.

This is a decision transparency document explaining how we make choices, manage risks, and integrate donations into a system that can be monitored and corrected.

Core Difference: Building Trustworthy Systems

In most water projects, "success" is defined as the day construction is completed.

However, we have confirmed: Whether water resources can still be used safely and equitably five years later is the real key question.

Traditional vs. Systems Approach:

Traditional Approach	Systems Approach
Complete one well	Build a water governance system
Handover upon completion	Five-year tracking commitment
Single-point solution	Multiple water sources to reduce risk
Prioritize by urgency	Prioritize by sustainability and risk
Responsibility ends at completion	Responsibility extends beyond construction

Case Study: Comparison

Case A: An organization drilled successfully in Community A. Two years later, due to unclear management, the community returned to unsafe water.

Case B: We spent three months on assessment and coordination in Community B, chose hand pump plus rainwater collection. Five years later, still operating stably.

Key difference: Not engineering technology, but upfront judgment, responsibility design, and long-term tracking.

Climate Change: How It Changes the Game

Previously, water projects were built on the assumption of stable natural conditions. Climate change is changing this premise.

Real impacts of climate change:

- **More extreme rainfall:** Alternating floods and droughts
- **Longer dry seasons:** Shallow water sources dry up more easily
- **Disrupted groundwater recharge:** Past rules of thumb no longer reliable
- **Changed contamination risks:** Extreme rainfall increases pollution entering water sources

When wells stop working, most blame equipment or maintenance.

But under climate risk, more failures stem from governance and system design gaps. Completion does not mean risk disappears.

Our response:

- Include climate instability in assessments
- Don't apply past experience to changed environments
- Use multiple water sources to reduce single-point failure risk

Five-Year Tracking and Responsibility Boundaries

Most water projects end responsibility at completion. We extend it beyond construction, providing five-year tracking.

Meaning of tracking: Not guaranteeing permanent operation, but ensuring projects are continuously monitored.

What we track:

- Water source usage and basic functionality
- Whether management structures continue operating
- Whether external conditions have significantly changed
- Whether water quality remains acceptable

Responsibility boundaries:

What We Do	What We Don't Do
Upfront geological survey and risk assessment	Daily operations management
Project design and systematic planning	Cover all repair costs
Coordination and quality supervision	Guarantee permanent operation
Five-year institutional tracking	Replace government responsibilities

Beneficiary Selection

Water needs are urgent in most communities, but "need exists" does not equal "immediately suitable for intervention."

Selection combines public health, geological risk, and governance feasibility.

Three evaluation dimensions:

1. **Public health risk:** Whether water shortage poses real health risks
2. **Geological and climate feasibility:** Whether surveys show basic viability
3. **Governance and management capacity:** Whether community has minimum coordination ability

Case Study: A Proposal We Rejected

Community C had extreme needs—children walked 3 hours daily for water.

But groundwater exceeded 150 meters, costs were extremely high, and community factions had long-term disputes over management.

Decision: Delay intervention, first establish rainwater collection and governance capacity. This is not abandonment, but responsible delay.

Part Two: How We Work

Services Overview

No single water solution fits all situations. We configure different services based on conditions.

Type	Suitable For	Depth	Core Value
Hand Pump	Unstable power, limited repairs	20-60m	Low threshold, long-term stability
Solar Well	High demand, concentrated population	60-120m	High output, low operating cost
Rainwater	Clear rainy season	-	Supplementary, non-drinking
Well Repair	Existing broken wells	-	Cost-effective, quick recovery

Case Study: Strategic Combination: School D

Primary: Solar deep well. Supplementary: Rainwater collection. Backup: Nearby hand pump.

Even if one system fails, the school still has basic water supply.

Geological Survey and Risk Assessment

Geological survey is the most critical preliminary work. Under climate change, past experience is no longer sufficient.

Risk Level	Basis	Action
Low Risk	Clear geology, sufficient local experience	Preliminary survey sufficient
Medium Risk	Uncertain aquifer location	Initiate professional survey
High Risk	Complex geology, extreme climate	Full assessment or no intervention

Core purpose: Not guaranteeing water, but clearly defining success probability and risk boundaries.

Site Selection Principles

Site selection considers three dimensions: geological conditions, public accessibility, and management feasibility.

1. **Geological conditions:** Aquifer depth, long-term yield, seasonal variation risk
2. **Public accessibility:** Public land, safe access routes, beneficiary coverage
3. **Management feasibility:** Clear responsible party, available maintenance resources

Case Study: Rejecting Perfect Geological Conditions

Village E had excellent geology—35 meters to stable aquifer. But three families had long-term land disputes.

Decision: Refuse to drill. Because after completion, the well would fall into management vacuum.

Hand Pump Design

In areas with unstable power and limited repairs, hand pumps are often the most reliable choice.

Core values:

- **Understandable:** Community can understand how it works
- **Operable:** No external technology needed
- **Manageable:** Low repair threshold
- **Sustainable:** No dependence on electricity

Design Aspect	Approach
Drilling Depth	20-60 meters, prioritizing stability
Well Head Protection	Concrete platform, drainage slope, cover
Pump Selection	Locally repairable models, standardized parts
Hygiene Design	Hardened water point, drainage, animal barriers

Five-year survival rate: 78% (extremely arid areas). Most remain functional 5-10 years.

Solar Wells and Rainwater Collection

For high-demand locations like schools and clinics, single hand pumps cannot meet stable supply needs.

Component	Function
Deep Borehole	60-120 meters, more stable aquifer
Solar Pumping	Grid-independent, low operating cost
Storage Facility	Ensures supply during night and cloudy days
Piping	Multiple water points, reduced crowding

Rainwater collection: Supplementary source for non-drinking uses, reducing pressure on groundwater wells.

Well repair: Cost-effectiveness far exceeds new construction, typically saving 70-85%.

Drilling Depth and Yield Assessment

"Deeper means more water" is a common but dangerous myth. We use long-term stable yield as the core metric.

Risks of over-drilling:

- **Costs surge:** Each additional 10 meters may increase costs 20-30%
- **Disrupts water balance:** Over-extraction lowers regional water tables
- **Higher maintenance difficulty:** Deep well pumps have higher failure rates

Case Study: Refusing to Go "Deeper"

Community F reached 800 liters/hour at 45 meters. Contractor suggested continuing to 80 meters.

Decision: Stop at 45 meters. Three years later, still maintaining 600+ liters/hour in driest season.

Water Quality and Public Health

Water existence does not equal water safety. Without quality confirmation, wells may still pose health risks.

Water quality assessment:

1. **Distinguish uses:** Drinking water must pass testing
2. **Continuous monitoring:** Initial, rainy season, dry season tests; immediate testing if abnormal

Water Point Design and Contamination Prevention

Even if groundwater is safe, water can become contaminated during collection.

Problem	Solution
Standing water	Hardened surface, drainage slope
Livestock access	Fencing, separate animal watering point
Dirty containers	Elevated platform, handwashing facilities
Debris entry	Locked well cover

Case Study: Water Point Renovation Impact

Clinic G had good water quality but high child diarrhea rates. Cause: Standing water and mud around water point.

After improvements, diarrhea rates dropped 60% in three months. Cost was less than 5% of original well.

Community Water Behavior and Hygiene Education

The most unpredictable yet impactful factor is not equipment, but human behavior.

Even with perfect engineering, if water usage isn't addressed, wells may fail prematurely.

Integration into livelihood programs:

1. **Agriculture programs:** Water management directly affects crop health
2. **Reusable pad programs:** Women naturally connect clean water with hygiene and safety

Through cross-sector collaboration, water donations generate long-term effects across multiple community dimensions.

Part Three: Governance and Accountability

Stakeholder Roles

Long-term viability depends on each party's role being correctly understood. We clearly define responsibility boundaries.

Role	Primary Responsibility	Not Responsible For
Donors	Support systems with risk judgment capacity	Engineering details, daily operations
Love Binti	Surveys, project design, five-year tracking	Daily operations, replacing government
Local Partners	Needs communication, daily management	Project design, major repairs
Technical Partners	Geological surveys, drilling	Project decisions, long-term management

Project Scoring and Prioritization

With limited resources, "which project first" is itself a responsibility. We establish reviewable scoring logic.

Indicator	Weight	Assessment Content
Public Health Risk	30%	Waterborne disease rates
Geological Feasibility	25%	Aquifer stability, construction feasibility
Climate Stability	20%	Seasonal variation risk
Community Governance	15%	Management responsibility
Long-term Impact	10%	Beneficiary population, demonstration effect

Case Study: How Scoring Works

Community I: High health risk (9/10), but low geological feasibility (4/10), overall 5.3/10

School J: All indicators medium-high (6-9/10), overall 7.9/10

Decision: Prioritize School J while building Community I's governance capacity.

Supplier Partnership: Dual-Track System

Single suppliers cannot bear all risks. We use consultant and local engineering dual-track cooperation.

Track	Role	Responsibility
Track 1	Hydrogeological experts	Geological surveys, risk assessment, site recommendations
Track 2	Local drilling teams	Actual drilling, equipment installation

Online Registry and Transparency

We maintain online registration recording the complete project journey from application to tracking.

Phase	Recorded Content
Application	Needs description, preliminary survey, whether entering evaluation
Scoring	Five indicator details, overall score, delay or rejection reasons

Execution	Site confirmation, drilling depth, water quality results, completion date
Five-Year Tracking	Regular reviews, issue reports, repair records

Your supported projects don't disappear after completion. Every decision has traceable documentation.

Risk Management

Water projects cannot guarantee zero failure. We design response mechanisms assuming problems may occur.

Type	Characteristics	Response
Repairable Technical	Equipment aging, parts damage	Initiate repair assessment
Management Issues	Usage conflicts, management vacuum	Coordination and re-education
Structural Failure	Geological changes	Record reasons, termination recommendation

Case Study: Facing Failure

Community K's well had drastically reduced output in year three. Cause: Two consecutive years of extreme drought.

Response: Honest report to donors, assess remedial measures, incorporate into future scoring adjustments.

Five-Year Tracking Mechanism

We provide at least five years of institutional tracking for every water intervention.

Phase	Frequency	Focus
Year 1-2: Intensive	Every 3 months	Initial issues, management establishment
Year 3-4: Stable	Every 6 months	Long-term stability, seasonal changes
Year 5: Evaluation	Full assessment	Continue or not, lessons learned

After five years:

- **Stable operation:** Record as success case
- **Needs continued attention:** Assess extended tracking
- **Failed:** Honestly record reasons, feed back to future decisions

Part Four: Impact and Partnership

Case Studies

We examine results from a systems operation perspective, not just "how many wells completed."

Case 1: Remote Community L

Background: Mountain village, about 350 people

Choice: Hand pump + contamination prevention + integrated with women's agriculture program

Five-year results:

- Stable output at 600 liters/hour
- Community completed 3 repairs independently
- Child diarrhea rates dropped 65%

Case 2: School M

Background: 600 students, unstable municipal water

Choice: Solar deep well + rainwater collection + flow management

Five-year results:

- Rainwater system reduced deep well pressure by 40%
- Waterborne disease sick days dropped 70%
- Only 8 days of system failure in 5 years

Case 3: Clinic N

Background: Health post well broken for 3 years

Choice: Repair + water point upgrade + hygiene education

Cost: $1,200 vs. new construction $8,500 (86% savings)

Result: Full function restored, diarrhea visits down 55%, 800 people benefited

Impact Measurement

If impact stays at output indicators, it cannot reflect real change. We shift from "what we did" to "what changed."

Traditional Output	Outcome Indicators
Built X wells	X% communities have stable safe water
Drilled X meters	Dry season yield maintains X liters/hour
Served X population	Waterborne disease dropped X%
Equipment running X years	X% still functional after 5 years

Scalability and Expansion

"Replicating success" is often misunderstood as copying engineering design. What's truly replicable is judgment and decision logic.

Not Replicable	Replicable
Drilling depth from Site A applied to Site B	Risk assessment methods
Management model from C forced on D	Decision logic and scoring mechanisms
Rainy region design used in arid region	Governance framework and tracking

Donor Guide

Option	Suitable For	How It Works
Support Overall System	Trust our judgment	Allocated by scoring mechanism
Designate Specific Project	Want deep involvement	Choose from evaluated projects
Support Preliminary Surveys	Value "invisible work"	Support geological surveys, risk assessment
Long-term Partner	Corporations/Foundations	3-5 year cooperation framework

Common Questions:

Q: How long until I see a completed well?

A: Hand pumps about 2-4 months, solar systems about 6-9 months.

Q: Why is preliminary survey so important?

A: It determines 90% of success rate. Careful site selection: under 10% failure; without assessment: up to 60% failure.

Conclusion

Climate change and social shifts bring unprecedented uncertainty to water projects.

The real difficulty is not finding water, but making responsible choices: where to intervene, how to intervene, and when not to intervene.

We believe:

- Water resources are not one-time engineering but patient public investment
- True impact is how many are still working stably after five years
- Honestly facing failure is more important than manufacturing false success
- Donors deserve a partner that learns, corrects, and acknowledges uncertainty

We don't just build wells. We build water systems people can trust.

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Document Version: 2.0 | Published: July 2025