Crops to End Hunger (CtEH)

CGIAR INITIATIVE ON Breeding Resources

Repairs & Maintenance - Financial Sustainability Guide

October 2024

Contents

1. Introduction

The **Crops to End Hunger** **(CtEH)** initiative is a strategic project aimed at addressing global food security by accelerating the development and delivery of improved crop varieties that are resilient to the effects of climate change, pests, and diseases. The project focuses on increasing the productivity, sustainability, and nutritional quality of staple crops, particularly in regions where food insecurity is most severe.

Partners and Funding

The **Crops to End Hunger** initiative is supported by major international funders such as the **Bill & Melinda Gates Foundation, USAID, GIZ, FCDO and ACIAR**. These organizations fund research efforts, infrastructure development, and capacity building to ensure that CtEH reaches the regions and populations most in need.

1.1. Purpose of this document

To provide practical strategies and best practices for maintaining and repairing assets that are critical to the success of the CtEH initiative. It will focus on ensuring financial sustainability by managing costs, maximizing asset lifespan, promoting safe and efficient use of resources.

This guide is designed to primarily to assist those responsible for maintaining, operating, and using the assets of the Crops to End Hunger (CtEH) initiative. It provides strategies to ensure that all repairs and maintenance are conducted effectively while maintaining financial sustainability.

1.2. Importance of Financial Sustainability

1.2.1. Why Financial Sustainability Matters

Ensuring that repairs and maintenance are funded effectively without compromising long-term operational, research, health, safety, and environmental goals.

Proper cost recovery and funding is required to ensure safe working conditions, protect the environment, and ensure that research activities continue uninterrupted.

1.2.2. Full Cost Recovery

This means ensuring that all expenses related to repairs and maintenance – not limited to labour, materials, training, spare parts, systems and tools are accounted for and recovered over time. This protects long-term operational budgets and minimizes unforeseen costs.

1.3. Key Recommendations

Table 1 – Key Recommendations for Financial Sustainability

Recommendation	Description
Conduct an Initial Assessment of CtEH Assets	Evaluate the current state of the assets you are responsible for and will be responsible for in the future. Identify which maintenance practices are already in place and where improvements are needed. For example, reduce Reactive Maintenance and increase Preventative Maintenance.
Develop a Repairs and Maintenance Financial Sustainability Policy	Create a formal policy that outlines the financial strategies for financial sustainability in maintaining and repairing assets, including full-cost recovery, demand forecasting, budgeting, and the creation of a reserve fund. The outcome from this policy should enable the development of Standard Operating Procedures (SOPs) and Service Level Agreements (SLA's) etc.
Collaborate with Finance – Develop a Full-Cost Recovery Model	Collaborate with finance teams to develop a plan for creating a financial model for the purpose of full-cost recovery of repairs and maintenance. A full-cost recovery financial model can ensure that repairs and maintenance costs are considered in project proposals, included in budgets and reasonable costs are allocated to research science, ensuring sustainability.
Evaluate a Maintenance Management System	Begin by evaluating Maintenance Management Systems that suits your organization's needs. This system should be capable of managing preventive and reactive maintenance tasks, tracking spare parts, generating reports and have the potential to integrate (or easily be used in conjunction) with finance and procurement systems

Maintenance Methodologies	Evaluate and consider using maintenance methodologies such as Total Productive Maintenance (TPM) and assess if the implementation of a methodologies can be beneficial in your organisation.
Communication Plan	Develop a communication plan that outlines how, which stakeholders, and when they will be engaged regarding all aspects of repairs, maintenance, and asset management. The plan should cover key stakeholders, including funders, research scientists, finance teams, procurement departments, and both internal and external partners (e.g. national, regional and local level).
Farm Operations Management Committee	Explore the establishment of a Farm Operations Management Committee, including internal stakeholders and representatives from NARES, to collaborate on maintenance strategies and share knowledge.

1.4. Acknowledgements

We would like to express our sincere gratitude to the funders of the CtEH, without there continued and ongoing support the success of the CtEH projects would not have been achieved.

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- Bill & Melinda Gates Foundation
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- United States Agency for International Development (USAID)

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- AfricaRice
- Alliance of Bioversity International and CIAT

- International Institute of Tropical Agriculture (IITA)
- International Maize and Wheat Improvement Center (CIMMYT)
- International Rice Research Institute (IRRI)

National Agricultural Research and Extension Systems (NARES) operating in Africa, Asia, Latin America, including:

  - Council for Scientific and Industrial Research (CSIR) / Crops Research Institute (CRI) [Ghana]
  - Council for Scientific and Industrial Research (CSIR) / Savanna Agriculture Research Institute [Ghana]
  - Kenya Agricultural and Livestock Research Organization (KALRO)
  - National Agricultural Research Organisation (NARO)
  - Zimbabwe: Department of Research and Specialist Services (DR&SS)

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2. Benefits to Financial Sustainability

Effective repairs and maintenance of assets related to the **Crops to End Hunger (CtEH)** initiative offer a range of significant benefits. Proper maintenance ensures that these critical assets—whether they are physical infrastructure, machinery, or research equipment—remain operational and continue to contribute to the success of the initiative and beyond. Below are the key benefits of maintaining CtEH assets effectively:

1. Enhanced Asset Lifespan

- **Prolonged Usefulness**: Regular and preventive maintenance extends the lifespan of equipment and infrastructure, delaying the need for costly replacements. This ensures that the assets continue to function well beyond their expected lifecycle, reducing capital expenditures.
- **Minimized Downtime**: Proper repairs and upkeep prevent unexpected breakdowns, keeping assets available for use when needed. In the context of CtEH, this helps maintain continuity in critical research and farming activities.

2. Cost Efficiency

- **Reduction in Emergency Repairs**: Preventive maintenance is less expensive than reactive or emergency repairs. By identifying and addressing small issues before they become major problems, costs associated with unexpected failures are significantly reduced.
- **Optimal Use of Resources**: Well-maintained equipment operates more efficiently, leading to reduced energy consumption, lower operational costs, and less waste. This is particularly important for agricultural and research equipment that relies on power or resources.

3. Increased Research Productivity

- **Reliable Research Operations**: CtEH assets, such as research laboratories, machinery, and irrigation systems, are essential to conducting agricultural research. Proper maintenance ensures that these assets function optimally, allowing uninterrupted research activities, faster results, and more accurate data collection.
- **Reduced Project Delays**: When assets are properly maintained, delays in research projects are minimized. This allows research teams to meet their timelines for developing crop varieties, conducting field trials, and producing impactful results.

4. Improved Health, Safety, and Environmental Standards

- **Safer Working Conditions**: Good maintenance practices ensure that equipment and facilities are safe for use, reducing the risk of accidents and injuries to maintenance teams, researchers, and operators.
- **Compliance with Environmental Regulations**: Properly maintained assets, especially those involved in agriculture and research, are less likely to cause environmental damage through leaks, emissions, or malfunctions. This supports the environmental sustainability goals of the CtEH initiative.

5. Protection of Research Investments

- **Safeguarding of Research Data**: In the CtEH initiative, research data generated from field trials and experiments are invaluable. Ensuring that the assets used in these processes (e.g., lab equipment, computers, or field infrastructure) are well-maintained helps to protect data integrity and avoid loss due to asset failures.
- **Maximizing Fund Utilization**: Donor funds and financial investments in the CtEH initiative are better utilized when assets are maintained to prevent unnecessary repair or replacement costs. This allows more resources to be directed towards achieving the research goals of the initiative.

6. Full Cost Recovery - Planning and Forecasting

- **Predictable Maintenance Costs**: With a well-managed maintenance plan, it becomes easier to predict and plan for maintenance costs, reducing budget variability and improving Full Cost Recovery. Centers can allocate funds more accurately to specific repairs, replacements, or upgrades.
- **Long-Term Asset Management**: Regular maintenance practices help track the condition of assets over time, allowing decision-makers to plan for asset renewal and replacements at the right time, avoiding last-minute or unplanned expenses.

7. Contribution to Program Longevity

- **Sustained Program Success**: Assets that are well-maintained support the long-term success of the CtEH initiative by ensuring that operations are sustainable. This contributes to the ability to achieve program goals, such as increasing agricultural productivity, reducing hunger, and improving food security.
- **Support for Expansion**: Effective asset maintenance frees up resources that can be reinvested in expanding research capabilities or scaling successful projects to additional regions or crops.

8. Strengthening Donor and Funder Confidence

- **Accountability and Transparency**: Demonstrating that assets are well-maintained and used efficiently builds trust with funders and donors. It shows that their investments are being managed responsibly and that the initiative is making the most of its financial resources.
- **Increased Funding Opportunities**: Centers that can show strong asset management practices are more likely to attract additional funding or grants, as funders are more confident in the initiative's ability to manage its assets and resources sustainably.

2.1 Lack of Financial Sustainability in Repairs & Maintenance

Not having an effective repairs and maintenance system can lead to several significant drawbacks, challenges, and problems, particularly in terms of costs, impact on research, and health, safety, and environmental risks. Below is an analysis of the main potential negative outcomes:

1. Increased Costs

- **Higher Emergency Repair Costs:** Without proper preventive maintenance, assets are more likely to experience unexpected breakdowns, leading to costly emergency repairs.
- **Shortened Asset Lifespan:** Poor maintenance practices lead to faster wear and tear of assets, reducing their useful life. This results in more frequent replacements of expensive equipment, machinery, or infrastructure, increasing capital expenditure.
- **Inefficient Use of Resources:** Malfunctioning equipment can consume more resources (e.g., energy, water, fuel) than well-maintained assets, leading to increased operational costs.
- **Downtime Costs:** Ineffective maintenance causes equipment or infrastructure to fail unexpectedly, leading to significant downtime.

2. Negative Impact on Research

- **Research Interruptions:** Unreliable assets, such as laboratory equipment or field machinery, can lead to interruptions in ongoing research projects. This can delay critical research milestones, affect data collection, and potentially compromise the results of long-term experiments.
- **Loss of Research Data:** Equipment failures, especially in data-collection instruments, can lead to the loss of important research data. In the context of agricultural research,

losing seasonal data (e.g., crop yields or environmental data) can set projects back by months or years.

- **Reduced Research Output:** The inability to rely on essential assets may lead to decreased productivity. This, in turn, may lower the quality and quantity of research outputs, affecting the overall impact of the research Center or project.
- **Lowered Research Funding:** Donors and funders often look at the track record of research Centers. If projects are delayed or fail due to asset mismanagement, funders may reduce future financial support or even withdraw funding, causing long-term financial strain.

3. Health, Safety, and Environmental Risks

- **Increased Risk of Accidents:** Without regular maintenance, equipment can become unsafe, leading to increased risks of accidents or injuries to staff. For example, poorly maintained farm machinery, electrical equipment, or lab equipment can malfunction, creating hazardous situations for operators and maintenance teams.
- **Unsafe Working Conditions:** In research environments, failure to maintain safety-critical equipment (such as ventilation systems, chemical storage facilities, or protective barriers) can lead to unsafe working conditions, exposing workers to health risks. This also increases the liability for the organization and can lead to regulatory non-compliance.
- **Environmental Damage:** Poorly maintained agricultural or research equipment can lead to environmental hazards. For instance, malfunctioning irrigation systems may lead to water wastage or soil degradation, while poorly managed waste systems can cause pollution or contamination. Additionally, equipment failures can lead to chemical leaks or other harmful environmental consequences.
- **Non-Compliance with Regulations:** Ineffective maintenance can result in non-compliance with health, safety, and environmental regulations. This may result in fines, legal penalties, or shutdowns by regulatory bodies, further increasing operational costs.

4. Loss of Organizational Reputation

- **Reduced Credibility**: When research centers or projects are unable to meet deadlines or deliver expected results due to equipment failures or maintenance issues, it can damage their reputation among funders, collaborators, and stakeholders.
- **Donor Confidence:** Regular reports of equipment failures or unsafe working conditions can erode the trust of donors and partners. This could limit the ability of the organization to secure future grants or funding, hindering the growth and continuation of research projects.

5. Operational Inefficiency

- **Suboptimal Asset Performance:** Assets that are not properly maintained do not perform at their optimal levels. In farming operations, poorly maintained machinery can lead to lower crop yields or operational inefficiencies. In research settings, malfunctioning lab equipment can produce inaccurate results, leading to wasted efforts and resources.
- **Higher Consumption of Spare Parts and Resources:** When assets frequently break down, there is an increased need for spare parts, which can lead to higher inventory costs and procurement delays. This can further strain maintenance teams and operational costs.

3. Key principles in repairs and maintenance

Effective maintenance and repair practices are grounded in certain fundamental principles that guide how assets should be managed to ensure their longevity, reliability, and cost-effectiveness. These principles ensure that assets are maintained not only to prevent breakdowns but also to optimize their performance throughout their lifecycle.

1. Preventive Maintenance

- **What It Is:** Preventive maintenance involves regular, scheduled maintenance activities to detect and address potential issues before they cause equipment failure. It includes routine inspections, servicing, and part replacements.
- **Why It's Important:** Preventive maintenance helps avoid costly emergency repairs, minimizes unplanned downtime, and extends the lifespan of assets. It is a proactive approach, ensuring that small issues are resolved before they escalate into major problems.
- **Example:** Regularly lubricating machinery or cleaning filters to prevent overheating or mechanical wear.

2. Reactive Maintenance

- **What It Is:** Also known as breakdown maintenance, this principle involves repairing equipment after a failure or malfunction occurs.
- **Why It's Important:** While preventive maintenance can reduce the need for reactive maintenance, it is sometimes unavoidable. Having a plan in place to respond quickly to breakdowns minimizes the impact on operations.

- **Example:** Repairing a pump that unexpectedly fails during irrigation, ensuring that crop watering is resumed as quickly as possible.

3. Predictive Maintenance

- **What It Is**: This principle uses real-time data and monitoring technologies to predict when a failure might occur, allowing maintenance to be scheduled before a breakdown happens.
- **Why It's Important:** By leveraging data, predictive maintenance reduces the likelihood of unexpected failures. This approach enhances reliability and ensures maintenance is only carried out when necessary, saving costs on unnecessary servicing.
- **Example:** Using sensors to monitor the vibration of machinery and scheduling maintenance when unusual readings indicate a potential issue.

4. Corrective Maintenance

- **What It Is:** Corrective maintenance addresses known issues or defects that are not immediately critical but need to be corrected to prevent future failures.
- **Why It's Important:** It ensures that equipment continues to operate safely and effectively, addressing problems that might not cause immediate failure but could affect performance or safety in the long run.
- **Example:** Fixing a leaking valve before it causes a significant loss of water or energy efficiency.

5. Total Productive Maintenance (TPM)

- **What It Is:** TPM is a holistic approach that integrates all staff, including operators, into the maintenance process to ensure that machines and equipment are always operating at optimal efficiency.

- **Why It's Important:** By involving everyone in maintenance activities, from technicians to operators, TPM reduces breakdowns, improves performance, and fosters a culture of responsibility for asset care.
- **Example:** Training operators to conduct minor repairs or maintenance checks, reducing the load on specialized maintenance teams.

6. Health, Safety, Environment and Compliance

- **What It Is:** This principle ensures that all maintenance and repair activities comply with safety regulations and environmental standards.
- **Why It's Important:** Properly maintained equipment operates more safely, reducing the risk of accidents. Compliance with environmental standards also ensures that operations do not harm the surrounding environment or violate local regulations.
- **Example:** Regular safety inspections and adherence to safety protocols during maintenance to prevent worker injury.

3.1 Recommended Actions - Key Principles in Repairs and Maintenance

1. Conduct an Initial Assessment of CtEH Assets

Action: Evaluate the current state of the assets you are responsible for and will be responsible for in the future. Identify which maintenance practices are already in place and where improvements are needed. For example, reduce Reactive Maintenance and increase Preventative Maintenance.

Why: Understanding the current condition of your assets and future requirements is critical for planning future maintenance activities and addressing any urgent issues.

4. Strategies for financial sustainability

This section focuses on providing a guide for strategies for the long-term financial sustainability of repairs and maintenance activities related to CtEH assets.

Financial sustainability means that all the costs associated with maintaining and repairing assets are effectively planned for, accounted for, and recovered. This ensures that the assets continue to function without financial strain on the organization, helping to support the CtEH initiative's operational and research goals.

Key Elements of Financial Sustainability in Repairs and Maintenance:

1. Repairs and Maintenance Policy for Financial Sustainability

- **What It Is:** A formal policy that outlines the objectives, responsibilities, and collaboration with other areas for repairs and maintenance activities. Scientists, for example would be required to provide the demand for the assets and finance would be required to create a cost model for repairs and maintenance or to integrate any refinements.
- **Why It's Important:** Establishing a clear policy ensures that everyone involved understands the processes and financial requirements for maintaining assets over the long term. It sets the foundation for sustainable practices, financial planning, analysis and budgeting.

2. Full-Cost Recovery Models

- **What It Is**: Full-cost recovery involves ensuring that the total costs of maintaining and repairing assets—such as labour, parts, and overheads—are built into project proposals, and subsequent operational budgets and recovered over time. Repairs and

maintenance are required to be considered from the very start and should be agreed with funders prior to contracts being signed.

- **Why It's Important:** This ensures that maintenance activities are fully funded, protecting future budgets from being depleted by unexpected repair costs.

3. Budgeting for Repairs and Maintenance

- **What It Is**: The process of planning and allocating financial resources for routine and emergency repairs over the asset's lifecycle.

- **Why It's Important:** Proper budgeting allows organizations to anticipate costs, avoid financial shortfalls and avoid unnecessary ambiguity on who should incur the cost of repairs and maintenance. It also helps ensure that maintenance is not delayed due to a lack of funds, which could lead to more expensive repairs later.

4. Maintenance Reserve Fund (Best Practice)

- **What It Is:** A reserve fund specifically set aside to cover unexpected maintenance or repair costs. This is best practice internationally and provides multiple benefits to ensuring operating efficiency of assets.

- **Why It's Important:** This fund provides a financial buffer, ensuring that emergency repairs can be handled without disrupting the overall budget. It is particularly important for aging assets or equipment with higher repair risks.

5. Integration with Systems

- **What It Is**: Integrating maintenance tracking systems, such as Maintenance Management Systems, with financial and procurement systems.

- **Why It's Important:** This ensures that all costs related to maintenance are accurately tracked, invoices are processed efficiently, and financial transparency is maintained.

4.1 Recommended Actions - Financial Sustainability Strategies for Repairs and Maintenance

1. Develop a Repairs and Maintenance Policy

- **Action:** Create a formal policy that outlines the financial strategies for financial sustainability in maintaining and repairing assets, including full-cost recovery, demand forecasting, budgeting, and the creation of a reserve fund.
- **Why**: This policy will serve as the framework for ensuring that repairs and maintenance are funded consistently and sustainably. The outcome from this policy should enable the development of Standard Operating Procedures (SOPs) and Service Level Agreements (SLA's) etc.

2. Review Current Maintenance Costs

- **Action:** Conduct a review of current maintenance costs for all assets, including routine and emergency repairs, to understand where financial gaps may exist.
- **Why:** Understanding existing costs is crucial for accurate budgeting and planning for future expenses.

3. Collaborate with Finance – Develop a Full-Cost Recovery Model

- **Action:** Collaborate with finance teams to develop a plan for creating a financial model for the purpose of full-cost recovery of repairs and maintenance. A full-cost recovery financial model can ensure that repairs and maintenance costs are considered in project proposals, included in budgets and reasonable costs are allocated to research science, ensuring sustainability.

- **Why:** This will ensure that the organization recovers all costs related to repairs and maintenance over time, preventing unexpected financial strain.

4. Establish a Maintenance Reserve Fund

- **Action:** Set up a reserve fund to cover unexpected repairs. This could involve setting aside a percentage of the annual maintenance budget specifically for emergency repairs.
- **Why:** A reserve fund ensures that unforeseen breakdowns do not derail the overall budget or delay critical maintenance.

5. Track, Monitor, Review and Refine

- **Action:** Establish a strategy to create a comprehensive set of financial reports for tracking key financial data.
- **Why:** Developing these reports will enable the consistent monitoring of financial performance, such as comparing actual expenditure against the budget. This process will help refine cost.

5. Tools, systems and methodologies

Effective tools and systems are crucial for managing and maintaining assets efficiently, ensuring that repairs are handled in a timely, cost-effective manner, and that assets are fully optimized throughout their lifecycle.

For the Crops to End Hunger initiative, where assets are spread across various regions, countries and used by different teams, having the right systems in place is key to ensuring that all repairs and maintenance tasks are tracked, managed, and completed in alignment with financial sustainability goals.

The following are examples of tools that could be considered as a package of measures for effective maintenance management.

Key Tools, Systems & Methodologies:

1. Computerized Maintenance Management System (CMMS)

- **What It Is:** A CMMS is a software platform that helps organize, plan, track, and optimize maintenance activities. It records information about maintenance schedules, asset histories, spare parts inventories, work orders, and more.
- **How It Helps:** CMMS streamlines the entire maintenance process by automating workflows, ensuring that preventive maintenance tasks are scheduled and completed on time, and tracking the costs associated with each maintenance activity.

Benefits:

- Reduces equipment downtime by planning preventive maintenance.
- Provides a central repository for all maintenance-related information.
- Improves transparency, allowing stakeholders to see the status and costs of maintenance tasks in real time.

- Helps track the lifecycle of each asset, providing insight into when replacements or upgrades are necessary.

2. Farm Management Systems (FMS)

- **What It Is:** FMS software helps agricultural operations manage their assets, resources, and operations efficiently. It integrates farm management activities such as equipment use, resource allocation, and maintenance scheduling.
- **How It Helps:** FMS tracks the use of machinery and farming equipment, ensuring that maintenance is planned based on actual usage data rather than relying on general schedules. This makes it easier to align equipment use with maintenance needs, preventing breakdowns during peak operations.

Benefits:

- Offers real-time data on equipment usage, performance, and maintenance needs.
- Enhances decision-making by linking maintenance tasks to farm operations and resource use.
- Optimizes resource allocation by coordinating repairs with farming schedules.

3. Value Chain Systems – Maintenance Management, Procurement and Financial

- **What It Is:** By utilising a combination of systems such as Maintenance Management System, procurement and financial creates a holistic view of the repairs and maintenance value chain and can create a unified approach to managing maintenance costs, resource procurement, and asset lifecycle planning.
- **How It Helps:** Linking maintenance management with financial systems ensures that maintenance costs are tracked accurately, budgets are adhered to, and invoices are processed efficiently. Integration with procurement systems ensures that parts and materials required for repairs are ordered in a timely manner, reducing delays.

Benefits:

- Improves financial tracking and transparency, ensuring that maintenance costs are aligned with budget forecasts.
- Streamlines procurement by automating the process of ordering parts and supplies when maintenance is needed.
- Ensures that maintenance activities are fully aligned with the broader value chain, minimizing disruptions to operations and research activities.

4. Maintenance Reporting and Analytics

- **What It Is:** Reporting tools and analytics dashboards provide real-time insights into maintenance performance, costs, and asset health. These tools generate reports that track key metrics, such as downtime, maintenance frequency, costs per repair, and the overall condition of assets.
- **How It Helps:** Reporting tools help users monitor the effectiveness of maintenance strategies, enabling continuous improvement and optimizing the use of assets.

Benefits:

- Provides actionable data for decision-making and long-term planning.
- Identifies trends in maintenance activities, allowing for adjustments to prevent future breakdowns.
- Ensures financial accountability by tracking the cost-effectiveness of maintenance practices.

5. Total Productive Maintenance (TPM)

- **What It Is:** TPM is a methodology, and a proactive maintenance strategy aimed at maximizing the efficiency, performance, and reliability of equipment by involving all employees, from operators to maintenance teams, in maintaining machinery and processes. TPM focuses on preventing equipment failures, minimizing downtime, and improving the overall production process.

- **Why It's Important:** Empowers the workforce, involving operators in operators to maintenance teams to builds capability and encourages ownership of the equipment's condition.

Benefits:

- Training operators to conduct minor repairs or maintenance checks, reducing the load on specialized maintenance teams.

5.1 Recommended Actions - Tools, Systems & Methodologies

After understanding the importance of **Tools, Systems & Methodologies**, here are the recommended next steps:

1. Evaluate a Maintenance Management System

Action: Begin by evaluating Maintenance Management Systems that suits your organization's needs. This system should be capable of managing preventive and reactive maintenance tasks, tracking spare parts, generating reports and have the potential to integrate (or easily be used in conjunction) with finance and procurement systems.

Why: A Maintenance Management Systems will streamline your maintenance processes, reducing downtime, and providing a clear overview of asset health and maintenance costs.

2. Use Maintenance Reporting to Optimize Strategies

Action: Start generating and reviewing maintenance reports regularly. Use the data to evaluate the effectiveness of current maintenance strategies and identify areas for improvement.

Why: Ongoing analysis of maintenance performance ensures that you are continually optimizing the maintenance process, identifying cost savings, and improving asset performance.

3. Maintenance Methodologies

Action: Evaluate and consider using maintenance methodologies such as Total Productive Maintenance (TPM) and assess if the implementation of a methodologies can be beneficial in your organisation.

Why: A maintenance methodology can increase equipment efficiency, reduces downtime and maintenance costs, improves safety and product quality, extends asset lifespan, and fosters a culture of continuous improvement and operator engagement.


AFRICARICE CENTER,
IBADAN NIGERIA
2024WS
IRRIGATED LOWLAND(MET)
DESIGN: ALPHA LATTICE
NO OF REPS: 3 D.T: 25/7/2024
NO OF ENTRIES: 45
DATE SEEDED: 4/7/2024

6. Stakeholder Engagement and Expectation Management

Engaging stakeholders effectively is crucial to the success of financially sustainable repairs and maintenance. This includes regular communication with all parties involved—whether they are responsible for funding, using, or maintaining assets.

Managing expectations from the outset ensures that everyone understands the goals, limitations, and requirements of maintaining critical assets, leading to better collaboration and smoother operations.

In a research Center, the if a maintenance team regularly communicates with asset operators and research scientists to schedule preventive maintenance without disrupting ongoing experiments. Financial teams are informed in advance of any significant maintenance expenses to ensure that the budget is available. This proactive communication helps avoid equipment downtime during critical research periods and ensures that all parties are aware of their financial commitments.

1. Stakeholder Engagement and Expectation Management

- **What It Is:** Stakeholder engagement ensures open communication with all parties involved in asset maintenance—maintenance teams, operators, research scientists, financial teams, and donors—aligning their roles and expectations for effective management.
- Stakeholder engagement should occur at a national, regional and local level of farm operations with a view to potentially access incremental grant funding or for example, exploring collaboration areas such as your research Center providing training.
- **Why It's Important:** Clear engagement minimizes misunderstandings, improves cooperation, and ensures that financial resources for repairs are properly allocated, supporting long-term sustainability.
- **Example:** Regular communication between maintenance teams and financial staff ensures preventive maintenance is scheduled without affecting research, and that all parties are aware of upcoming costs.

2. Setting Clear Expectations

- **What It Is:** This involves defining each stakeholder's role, responsibilities, and financial obligations in the maintenance process to ensure alignment and avoid confusion.
- **Why It's Important:** Clear expectations streamline repairs, reduce delays, and ensure all parties understand their financial responsibilities.
- **Example:** Operators report issues, maintenance teams handle repairs, and scientists contribute to the budget. Everyone knows their role, ensuring repairs are timely and budgets are managed.

3. Regular Communication

- **What It Is:** Scheduled meetings and reports ensure all stakeholders stay updated on maintenance activities, costs, and potential challenges.
- **Why It's Important:** Consistent communication fosters trust helps identify issues early and ensures proper planning for repairs and budget management.
- **Example:** Periodic (e.g. monthly) meetings between maintenance and financial teams help discuss equipment status, upcoming repairs, and financial tracking, ensuring transparency.

4. Managing Risks and Expectations

- **What It Is:** This involves identifying potential risks (e.g., budget shortfalls) and clearly communicating them to stakeholders, so everyone is prepared.
- **Why It's Important:** Managing risks upfront reduces their impact and ensures stakeholders have realistic expectations about equipment maintenance.
- **Example:** The team informs stakeholders about the aging equipment that might need repairs soon, allowing for budget adjustments and downtime planning.

5. Building Consensus and Collaboration

- **What It Is:** informing and potentially involving certain stakeholders in the proposed strategy for repairs, budgets, and maintenance priorities fosters collaboration and shared responsibility.
- **Why It's Important:** Collaboration leads to more effective decisions and aligns everyone with financial and operational goals.
- **Example:** When significant repairs are needed, stakeholders work together to decide whether to repair or replace equipment, ensuring the best use of resources.

6. Establishing a Farm Operations Management Committee

- **What It Is:** The Farm Operations Management Committee is a formal group comprised of key internal stakeholders, such as maintenance teams and research scientists, and external stakeholders, such as representatives from NARES (National Agricultural Research and Extension Systems). The committee meets regularly to discuss common themes, challenges, and opportunities for collaboration and knowledge sharing related to repairs and maintenance.
- **Why It's Important:** Creating this committee promotes collaboration across research organizations and NARES, ensuring that best practices are shared, common challenges are addressed, and maintenance solutions are developed collectively. It fosters cooperation, leading to more efficient use of resources and better planning.
- **Example:** A Farm Operations Management Committee meets periodically (e.g. quarterly) to review major repairs, exchange information on cost-saving measures, and collaborate on solutions to common challenges like sourcing spare parts or managing aging equipment

6.1 Recommended Actions - Stakeholder Engagement and Expectation Management

1. Create a Communication Plan

- **Action:** Develop a communication plan that outlines how, which stakeholders, and when they will be engaged regarding all aspects of repairs, maintenance, and asset management. The plan should cover key stakeholders, including funders, research scientists, finance teams, procurement departments, and both internal and external partners (e.g. national, regional and local level).

- **Why:** A structured communication plan ensures that all stakeholders are regularly engaged and updated, promoting transparency and reducing the risk of misunderstandings or delays in the provision of a service. This helps keep everyone aligned with maintenance objectives and financial sustainability goals.

2. Consider Establishing a Farm Operations Management Committee

- **Action**: Explore the establishment of a Farm Operations Management Committee, including internal stakeholders and representatives from NARES, to collaborate on maintenance strategies and share knowledge.

- **Why:** Forming this committee promotes cooperation across research organizations, allowing for shared insights, cost-saving strategies, and collective problem-solving. It helps ensure that best practices are adopted and that maintenance challenges are addressed more effectively.

7. Roadmap for Future Activities: Developing an CtEH Asset Management Plan

To ensure long-term sustainability and effectiveness of repairs, maintenance, and overall asset management for the CtEH initiative, a comprehensive asset management plan is necessary. This plan should cover several key components to align operational, financial, and organizational goals.

1. Repairs and Maintenance Plan

- **What It Is:** A detailed plan that outlines the schedule, demand for the assets, budget, and processes for maintaining and repairing all assets. It includes preventive, predictive, and reactive maintenance strategies.
- **Why It's Important:** Ensuring that all assets are regularly maintained reduces the risk of equipment failure, extends asset lifespan, and controls maintenance costs.
- **Example:** A research facility can use maintenance management system to track all maintenance activities, ensuring that routine checks are performed on farming equipment every six months to prevent breakdowns during peak agricultural seasons.
    - Asset Inventory
    - Asset Condition Assessment
    - Maintenance Strategy
    - Asset Lifecycle Management
    - Monitoring and KPIs

2. Operations Service Management Plan

- **What It Is:** This plan defines the management of day-to-day operations, including asset use, service delivery, and operational efficiency. It ensures that assets are utilized effectively, and that service delivery is optimized.
- **Why It's Important:** An operations service management plan ensures that assets are not only maintained but are also utilized efficiently to support ongoing research and farming activities. It also ensures alignment with organizational goals.
- **Example:** The operations team establishes a service management plan to ensure tractors and other equipment are scheduled for specific farming tasks in coordination with field research, maximizing their use while minimizing downtime.

3. Health, Safety, and Environment Plan

- **What It Is:** This plan ensures that all aspects of asset management comply with health, safety, and environmental regulations. It outlines safety protocols, risk management procedures, and environmental sustainability goals.
- **Why It's Important:** A focus on health, safety, and the environment protects the workforce, minimizes environmental impact, and ensures compliance with local and international regulations. Proper protocols reduce the risk of accidents and promote sustainable practices.

CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org

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