Strategic Guidelines for Implementing ISO 14001:2015 in the Agricultural Sector. A case study for Golden Riverside Ltd

Samuel Nartey

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Laurea University of Applied Sciences **Abstract**
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The primary purpose of this thesis is to assist the case study organization, Golden Riverside Ltd, in establishing strategic guidelines for implementing ISO 14001:2015 Environmental Management System (EMS), which is in the agricultural sector. The study aims to help the agribusiness in aligning its environmental management practices with the international standards to enhance its sustainability, ensure compliance, and boost stakeholder confidence. Golden Riverside Ltd is the primary beneficiary of this thesis project, having commissioned it to pursue ISO 14001 certification and to prepare for other ISO certifications. The implementation task included developing an EMS framework for the organization, which involved drafting an environmental policy, setting environmental goals, and creating an implementation roadmap.

The theoretical framework is based on established literature about environmental management systems, ISO 14001:2015 standard requirements, and best practices in the agricultural sector. The research used both quantitative and qualitative research methods such as document review of ISO 14001 standard requirements, and interview with organizations' representative. Findings identified included gaps in Golden Riverside's current environmental practices and opportunities for improvement in their compliance status, documentation, etc.

While certification usually justifies the implementation of ISO 14001:2015, the objective of the thesis focused on guiding the organization toward identifying the requirements for implementation and certification. The thesis deliverables, including the environmental policy, environmental objectives, and the audit checklist, serve as preparatory tools to help meet the certification prerequisites. Even without formal certification, the guidelines may assist in managing the company's compliance and environmental impact risks.

Keywords: environmental risk management in agriculture, plan-do-check-act, sustainability

Contents

1 Introduction

Environmental Risk Management (ERM) has become an important issue in the agricultural sector, manufacturing industry, and beyond, causing the need for a structured management system framework like ISO 14001:2015 Environmental management systems (EMS) established by the International Organization for Standardization (ISO). This management system provides a framework that when followed, helps in assisting organizations to reduce their environmental impacts, tracks environmental performance while enhancing environmental sustainability. This perspective is supported by research from Lewicka and Lewicka (2019) which discusses the risks in agriculture that comes from environmental factors such as market volatility, natural disasters underscoring the need for ERM.

The thesis idea started from a discussion with the case study organization's representative who highlighted the importance of ERM in a systematic approach like implementing ISO 14001:2015 EMS to enhance regulatory compliance, sustainability and make their customers aware of their responsible approach towards the environment. The thesis process identified gaps in the organization's current systems and provided solutions to mitigate those gaps. The gaps identified are initial certification requirements that will get the organization closer to obtaining ISO 14001:2015 certification after going through an audit process.

The thesis utilized both qualitative and quantitative method approach. The significant portion of the methodological approach stems from the qualitative method which includes semi-structured interview with the company representative, document review and the quantitative aspect comes from comparing semi-structured interview data with already existing knowledge of ISO 14001:2015. This method gives Golden Riverside ltd a proper assessment in identifying the gaps that aligns with the research objectives.

Before presenting the recommendations, the thesis highlighted the key challenges of implementing ISO 14001 in the case study organization. This initial analysis gives the thesis project a clear understanding of the opportunities and threats the standard framework may pose within its operational context and stakeholders. The thesis contributes to both academic and practical discussions on environmental risk management by offering insights into threats and opportunities of ISO 14001:2015 implementation in the agricultural sector. The findings may be useful as a guide for small to medium enterprises (SMEs) in the agriculture sector that may want to enhance their environmental management system. The thesis utilized Grammarly tool to enhance the clarity of expression and correct grammatical errors.

1.1 Case Study Organization

Golden Riverside Ltd is an agribusiness focusing on the cultivation, processing, and export of quality food products from West Africa, Ghana. According to the Ghana Export Promotion Authority (GEPA), the organization has been exporting fresh pineapples to their partners in the EFTA and EEA countries since 2005. The organization also cultivates Onions and Okra for local and international export. It exports about 70% of its production and sells the rest within Ghana, helping to sustain the domestic food supply chain. (GEPA n.d.)

Global G.A.P. (Good Agricultural Practices) certification and LEAF (Linking Environment and Farming) certification have been obtained to ensure compliance with international agricultural standards and market requirements. Golden Riverside Ltd.'s certifications are globally recognized and reflect the company's dedication to sustainable agriculture, environmental sustainability, food safety, and ethical labor practices. Global G.A.P. certification ensures that the company adheres to strict guidelines regarding food safety, environmental management, and the welfare of workers, while LEAF certification promotes sustainable farming practices that reduce the environmental footprint and encourage responsible soil use. These certifications enhance the company's competitiveness in the European and global agricultural markets and enable stakeholder trust. (Golden Riverside Farms n.d.)

Consistency in supply, product freshness, product quality, and supply chain efficiency are the top three priorities of Golden Riverside Ltd. To ensure quality, the organization exports its final products by air so that fresh produce can reach its final destination on time, partnering with established companies like HPW Air Ghana and Blue Skies Ltd, which specialize in transporting perishable goods to help local businesses get their products to international markets. (GEPA n.d.)

1.2 Background of the study

According to the Food and Agriculture Organization, FAO (2020), the agricultural sector is essential for global economic growth, food security, jobs, and trade. However, in recent decades, sustainability and regulatory compliance have become critical mandates for the agribusiness industry worldwide. With increasing threats to the environment, organizations are constantly under pressure to adopt sustainable farming practices and comply with global standards (Klerkx & Begemann 2020).

In response to these challenges, the International Standardization Organization (ISO) has produced management frameworks that can function as guidelines to manage the operations of organizations. One of them is ISO 14001:2015, which guides organizations to follow a systematic approach in designing, implementing, measuring, and enhancing their

environmental management system (EMS). This standard helps organizations reduce their environmental impact while improving efficiency and meeting regulatory requirements. (Zobel et al.2015; ISO 2015.)

Research by the Organization for Economic Co-operation and Development, OECD (2012), along with findings from Barrett and Buchanan (2019), suggests that, identifying environmental risks, setting priorities and gradually implementing how to mitigate those risks has frequently led to changes in laws and tightening regulations.

Consequently, according to Eurostat (2023), there are around 9.1 million farms in the European Union area (EU), 3.6 million of which are considered commercial farms. However, between 2005 and 2020, the number of farms in the EU fell by 37%, and EU agricultural imports became increasingly important. Therefore, the EU implemented a stringent policy on imported agricultural products to ensure they meet high standards concerning environmental and food safety. All agricultural imports, for instance, must align with the EU's maximum residue levels (MRLs) for pesticides, making comprehensive and responsible farming practices urgent. (European Commission n.d.; World Economic Forum 2023.)

Lewicka and Lewicka (2019) discuss that ISO 14001:2015 certification is becoming increasingly critical for developing and maintaining an environmental risk management approach and ensuring compliance with international standards, which is why some companies may express interest for the certification.

It is important to note that ISO 14001 certification is not a legal obligation; however, organizations seeking certification must prove that they comply with the relevant environmental laws in their countries of operation. Furthermore, ISO does not certify or issue certificates; accredited certification authorities do this. For example, the Finnish Accreditation Service (FINAS) oversees the certification bodies KIWA and DNV etc.. in Finland, which grant ISO 14001:2015 and other related certifications to private companies after an audit. (ISO n.d.; FINAS n.d.)

1.3 Problem Statement

Golden Riverside Ltd. encounters challenges such as maintaining compliance with evolving EU environmental regulations and minimizing environmental risks. The lack of a structured Environmental Management System (EMS) hinders the organization's ability to systematically address environmental aspects and ensure long-term sustainability. Implementing ISO 14001:2015 offers a framework to bridge these gaps by establishing a structured approach to environmental management, enhancing compliance, and promoting continuous improvement through the Plan-Do-Check-Act (PDCA) cycle in accordance with ISO 14001:2015 requirements.

Boiral (2011), asserts the significance of ISO 14001:2015 Environmental management systems on how they help organizations enhance their performances, ensure compliances while maintaining efficient operational system. González-Benito and González-Benito (2005) also highlights the importance of ISO 14001:2015 in areas such as gaining competitive business advantage such as cost saving and promote good cooperate image while importantly promoting environmental sustainability. Regulatory bodies and stakeholders keeps increasing demand for the adoption of ISO 14001:2015 EMS as a strategic necessity for organizations aiming for sustainable growth. This thesis is important as it helps Golden Riverside to implement ISO 14001:2015 effectively in a manner that will promote long term regulatory compliance, reduce risk on environmental pollution and promote environmental sustainability. The findings could also serve as a model for other agricultural firms seeking to improve their environmental management practices. (Zeng Tam & Tam 2005.)

1.4 Research Objectives

The main objective of this thesis is to assist Golden Riverside Ltd. in taking a step closer to ISO 14001:2015 certification by addressing the organization's initial certification requirements. This involves initiatives such as establishing an environmental policy, identifying environmental objectives, and continuously improving the framework. As part of the research objective initiative, the thesis will propose a customized audit checklist in a form of a tool that will help Golden Riverside Ltd to conduct internal audit and monitor compliance regulations. Even though obtaining ISO 14001:2015 certification process is beyond the scope of this thesis, the thesis provides a solid foundation for the organization to follow a similar process when obtaining other ISO cerfications such as ISO 9001 quality management systems and ISO 45001 occupational health and safety management systems since they follow a similar structure .This allows the organizations to mitigate risk associated with sustainable operations, continuous improvement and enhancing business performance .

1.5 Holistic SSRM of the organization approach

Golden Riverside Ltd aims to promote workplace safety in a holistic manner thus identifying risk factor in its operating environments and its surroundings to ensure its activities are well-integrated and promotes environmental and occupational health. This section discusses how the organization handles and can improve on its Safety, Security and Risk Management (SSRM) plans mainly focusing on the environmental stewardship aspects.

A holistic SSRM as Savolainen (2023), explains can be defined as a comprehensive framework, grouped into multiple dimensions while integrating both objective and subjective aspects of safety and security. While the definition was originally applied to an educational environment, it holds similar significance for ERM. Savolainen discuses systematic activities including identifying hazards, risk assessment and risk mitigation strategies in a proactive

manner which are key components of ISO 14001:2015. Moreover, Savolainen has identified that in order for risk management to be effective, leadership is such a dependent factor. other factors includes effective communication, organizational culture and stakeholder perception. These factors are important in the context of agriculture where environmental hazards are highly influenced by both human activity and natural variation. Holistic SSRM in a nutshell does not focus on one area, it integrates various fields effectively to strengthen and enhance an organization's safety. In agriculture which poses environmental risk, there's a need to manage different risk simultaneously.

Furthermore, a holistic SSRM framework allows organizations to align their risk management practices with global standards such as ISO 45001 occupational health and safety, ISO 14001 environmental management systems, and ISO 9001 for quality management systems—promoting a comprehensive and consistent strategy. This helps organizations remain compliant, enhance their reputation, and reduce unexpected exposure that can affect functionality. (Savolainen 2023; ISO 2015a; ISO 2018; ISO 2015b.)

1.6 Environmental Safety

Environmental safety, according to ISO (2015), encompasses policies, practices, and regulations used to protect the environment from harmful human activities and natural disasters. Pollution control, resource conservation, and effective waste management, along with compliance with environmental laws and standards, are a few examples of how to ensure environmental safety, as outlined by the United Nations Environment Programme, UNEP (2012). This is essential for organizations, especially businesses in agriculture and international trade, such as Golden Riverside Ltd., which adheres to import standards, including the Maximum Residue Limits (MRLs) for pesticides established by the European Union. According to Labodová (2004), there are three main areas that organizations need to focus on to ensure environmental safety: Sustainable Resource Use, Compliance with Environmental Regulations, and Preparing for Environmental Risks.

Firstly, sustainable resources require organizations to judiciously manage their consumption of water, energy, and raw materials. Optimizing these resources minimizes waste, while conserving essential ecosystems, in turn, helps maintain long-term ecological stability. Eco-friendly practices and measures, such as recycling, using energy-efficient appliances, and utilizing renewable resources, contribute to reducing harm to the environment. As outlined, ISO 14001:2015 requires organizations to identify significant environmental aspects, which include resource use, and for organizations to incorporate some form of resource management into their environmental management systems. (Darnall & Edwards 2006; ISO 2015.)

Secondly, environmental regulation and compliance is significant to warrant that organizations comply to regulations that aims to protect environmental resources. This means that complying to requirements from governmental bodies such as Environmental Protection Agency (EPA) or European Environmental Agency (EEA) which overseas emission, waste management and resource consumption. An important aspect of ISO 14001:2015 EMS emphasizes on the identifying and meeting regulatory compliance responsibilities. Compliance failure can lead to reputational damage risk, legal actions etc. Which can cause destruction in operations and undermine stakeholder trust. On that note, compliance can protect against legal threats boost trust among stakeholders, including regulators, customers, and the public. (Morrow and Rondinelli 2002; ISO 2015.)

Plans to mitigate environmental risk involves the proactive identification, management and mitigation strategies of environmental hazards like pollution, natural disasters, climate events etc. The adoption of risk-based approach of ISO 14001:2015 requires organizations to evaluate environmental risks and create plans on how to mitigate and address those risks. Effective risk management does not only prevent environmental hazards but may show enhancement to the organization's resilience as a whole. On that note, organizations that prioritize risk prepedness are more likely to be fit against crises. The use of technology to monitor environmental hazards and adopting climate resilience strategies to account for the adverse chance in climate condition. With unforeseen changes in environmental climate and adverse resource consumption, originations that focus on ERM may gain competitive advantage over their counterparts that do not in a long term. (Testa and Iraldo 2010; ISO 2015.)

1.7 Environmental Risk Management

Environmental Risk Management (ERM) in the context of agriculture involves the identification of risk that has impact on the environment and action plans of finding strategic plans to mitigate those risks taking into consideration the severity of the risk's impact on the environment. Some of this risk includes the use effect of pesticide usage, energy usage, water consumption etc. Some agricultural activities which are positive could lead to several opportunities such as water conservation and efficient use of energy could lead to opportunities in cost savings and good brand reputation. In the same regard, negative practices such as improper waste disposal, air pollution and water pollution due to agricultural activities could lead to threats of legal fines, sanctions and high operational cost which in long term is not sustainable for business growth. Ensuring proper environmental risk management assist in mitigating those mentioned risk and ensure compliance with international standard by demonstrating a responsible commitment to environmental stewardship. (FAO 2020; Barton 2016.)

1.8 ISO 14001:2015 EMS

ISO 14001:2015 EMS is a structured framework consisting of clause requirements that is intended to guide organizations in defining their environmental goals and assisting them to achieve those set goals effectively and efficiently. Mann (2005) asserts, these systems positively influence organizations by enhancing operational efficiency, reducing risk, and improving sustainability (ISO 2015). The framework consists of a handful of key terms and definitions, including environmental aspect, environmental impact, and compliance obligations. Understanding the terms used in this thesis is particularly relevant, as it provides a fundamental understanding of the implementation of ISO 14001:2015, fostering proper management of environmental responsibilities and ensuring that it aligns with the principles of ISO 14001:2015.

The Table below briefly explains some commonly used terms adopted by ISO for auditing, and some terms used in the standard.

Table 1:Terms and Definitions of ISO 14001 Standards and Audit Definitions

Terms	**Definitions**
Environmental Aspects	Activities that interact with the environment.
Environmental Impact	The changes caused by environmental impact can harm the environment or cause good effects to the environment.
Management system	Can be defined as a framework that establishes policies and objectives.
Environmental policy	Motives of an organization that is designed by top management to guide an organization to reach a target.
Organization	This term is used interchangeably with agribusiness, company, etc. It represents Golden Riverside Ltd as a group that has its own functions and responsibilities.
Clause	These are chapters of rules which provides specific requirement definitions on how to follow the standard. They also usually have subclauses which talks about related subjects to the main clause
Top Management	Groups of officials in charge of directing activities of an organization

Documented Information	Data or information that is maintained by an organization for verification.
Audit	A systematic process that is conducted to obtain audit evidence to achieve a specific criterion
Conformity	Fulfillment of an audit requirement
Non-Conformity	Non-fulfilment of an audit requirement
Continual Improvement	Reoccurring activities to enhance environmental performance positively
Corrective Actions	Activities to eliminate non-conformities and prevent them from happening again.

1.9 The PDCA Cycle

ISO 14001:2015 adopts the Plan-Do-Check-Act (PDCA) model, which is the core aspect of improving environmental management practices. The PDCA cycle is a key element in guiding organizations to focus on their environmental impact while continuously assessing opportunities for improvement and corrective action. The PDCA cycle allows organizations to set measurable environmental goals, track their progress, and adjust their approaches for continuous improvement in environmental performance (ISO 2015.)

This phase of the thesis briefly explains the 10 main clauses of ISO 14001:2015 requirements with guidelines for use. It further elaborates the linkage between the clauses and the PDCA cycle. The PDCA is an adopted model that guides organizations in maintaining effective environmental management systems ensuring that the management systems are constantly reviewed and evaluated to peruse sustainability goals. Some of the main clauses thus from clause 4 to clause 10 has subclauses that provides further requirements for the organizations to conform. (Boiral et al. 2018).

The Table below provides brief explanation of the key clauses of ISO 14001:2015 along with their linkage to the PDCA cycle model.

Table 2 ISO 14001:2015 Clauses Summary and Requirement

Clause	Clause explanation	PDCA Stage
Clause 1-3	This section of the framework focuses on the scope, normative references and definition of terms. The scope refers to the barriers of their internal and external operations whiles the normative states that there is no normative reference which means that no document is required for this section.	
Clause 4 (Context of the Organizations)	This section discuss the organization's context—internal/external issues, stakeholder needs, and scope. This clause defines the context of the organization It provides the framework for understanding its interested parties, physical boundaries, and their needs and expectations.	Plan
Clause 5 (Leadership)	Clause 5 leadership focuses on leaders and their commitment to environmental sustainability. It emphasizes entirely the role that leadership plays in planning, resource allocation, ensuring, rechecking, and acting on targets.	Do
Clause 6 (Planning)	Clause 6 emphasizes the need of planning. it provides the framework and actions to address risk and opportunities. the subclauses also emphasize planning actions, activities that pollutes the environment, compliance obligation, planning environmental objectives, etc.	Plan
Clause 7 (Support)	The 7th clause elaborates on resource allocation, competency, awareness of environmental policy, and how communications are being implemented and monitored.	Do
Clause 8 (Operations)	The 8th part covers the operational functions and application of emergency preparations.	Do

Clause 9 (Performance evaluation)	The last but not the least clause focuses on monitoring, measuring, and analyzing data to ensure that environmental targets are met. This stage is relevant for inspections in a planned time to ensure continuous improvements.	Check
Clause 10 (Improvement)	The last clause discusses on improvement and corrective actions to. it assists the EMS by identifying gaps for improvement to achieve its goals. It facilitates the continuous learning approach to learn from non-conformities and how to mitigate environmental risk. It emphases the need to show action for continuous improvement	Act

The PDCA (Plan-Do-Check-Act) cycle is closely connected to the 10 clauses of ISO 14001:2015, with each phase linked to a specific stage in the standard. For instance, during the planning phase, organizations set environmental goals, identify risks, and develop plans to mitigate those risks, corresponding to clauses 4, 5, and 6. These clauses define the organization's environmental issues, leadership, and provide guidance on planning for environmental objectives. The Do phase is reflected in Clauses 7 and 8, focusing on providing the necessary resources and establishing processes to implement the planned actions. This phase is followed by the Check phase, which is connected to Clause 9 (Performance Evaluation), where the organization assesses the effectiveness of the EMS through monitoring and audits and reviews its progress. The final phase in the cycle, the Act phase, is linked to Clause 10 (Improvement), where any issues identified during the Check phase are addressed and the EMS is enhanced. The PDCA cycle ensures that the EMS operates smoothly, with each phase tied to the clauses that guide its development and improvement. (ISO 14001:2015.)

Figure 1 below further illustrates the relationship between the PDCA cycle and ISO 14001:2015 clauses, showing how each phase of the PDCA cycle addresses the various stages. In terms of continuous improvement through the PDCA cycle, leadership is consistently involved in all phases.

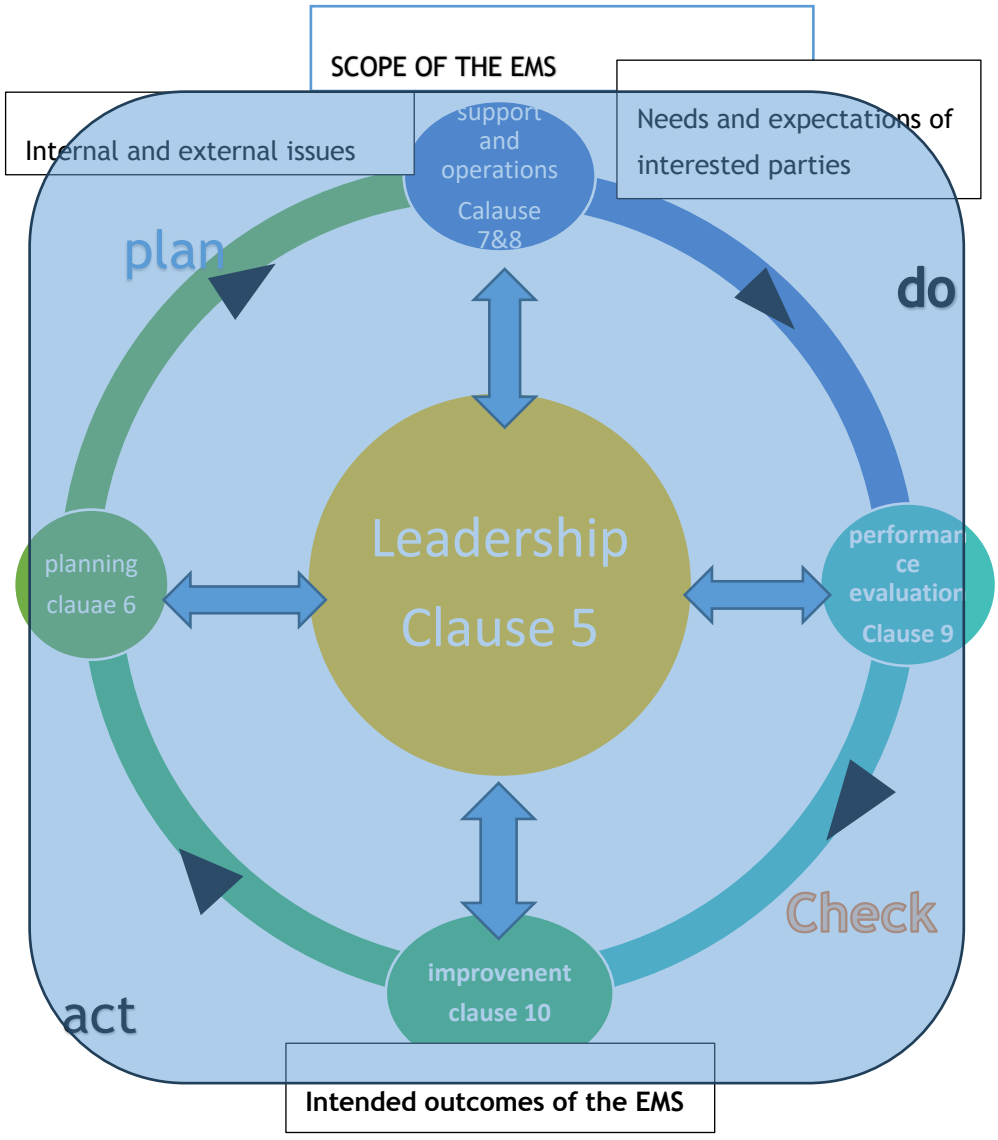

Figure 1 — Relationship between ISO 14001:2015 clauses and the PDCA cycle.Source: Adapted from TechQualityPedia (n.d.).

1.10 Challenges of implementing ISO 14001:2015

Implementing ISO14001:2015 in the agriculture sector can be beneficial, but it presents several challenges. Putrantomo and Hamzah (2021) discuss the financial effects of adopting ISO 14001 in the education sector. While their research is not directly related to agriculture, their findings offer insights relevant to the industry. Financial and human resource limitations were the significant barriers for implementation of ISO 14001:2015. For SMEs in the agriculture like Golden Riverside Ltd, this restriction can have significant effect on the implementation and maintenance of an EMS.

Putrantomo et al. (2021), also asserts further challenges such as insufficient technical knowledge. As many agribusinesses faces several shortages of trained staff that are familiar with environmental legislation, environmental risk assessment and sustainable environmental practices, implementing the framework can be complex. Some large organizations may be able to manage this difficulty whiles SME like Golden Riverside Ltd may struggle with effective implementation. Complexity of documentation, monitoring and reporting as required by the standard in clause 9 is partially accounts for the resistance and delays in implementation. One the other hand, these challenges are important for enhancing environmental sustainability in agriculture. Dhillon and Moncur, (2023) asserts that with proper organizational support, training and gradual implementation, ISO 14001:2015 may offer SMEs with long term benefits.

1.11 Importance of ISO 14001:2015

ISO 14001:2015 is a flexible standards framework and can be adopted and implimented by different organizations regarless of size and operations. The policies and objectives of each organization can be tailored according to the context of the organization according to clause 4, which elaborates the ‘Understanding the organization and its context’. Its design allows companies to develop an environmental management system (EMS) tailored to their specific circumstances, goals, and resources. As Heras-Saizarbitoria et al. (2011) explain, ISO 14001 isn’t just for large corporations; it also applies effectively to smaller companies, non-profits, and public organizations. This presents an opportunity for Golden Riverside Ltd., as it facilitates structured environmental risk management and strengthens relationships with customers, partners, and the wider community. The standard’s emphasis on continuous improvement makes it practical for any business seeking to incorporate environmental protection into its operations, regardless of the complexity of those operations (Delmas, 2009).

One of the reasons why ISO 14001:2015 is valuable is that it helps businesses earn trust among stakeholders. For Golden Riverside Ltd., getting certified may show customers, investors, and other partners that the company takes its environmental sustainability seriously. It means the

company is following regulations, reducing pollution, and focus on continuous improvement in terms of environmental issues. As Darnall et al. (2008) asserts, this kind of certification gives people confidence that the company is acting responsibly manner towards the environment.

Companies that practice environmental sustainability tends to work with others that share the same values. This could open doors for Golden Riverside to work with new partners who expect high environmental standards. Many environmentally conscious clients prefer to buy from or partner with companies that are certified and demonstrate a genuine commitment to sustainability. Through ISO 14001:2015 certification, Golden Riverside can attract environmentally sustainable clients and may boost its chances of being selected for contracts. (Delmas & Toffel, 2004).

It's important to take the financial constraint into consideration in a form of an investment. Research by López-Gamero, Molina-Azorín, and Claver-Cortés (2010) assets that organizations that are certified and implements robust environmental management systems such as ISO 14001:2015 gains competitive edge over organizations that do not take it into consideration of other forms of environmental risk management. Investors and financial institution recognize this advantage in which they approach these organizations as being more proactive at managing environmental risk in responsible manner. For Golden Riverside Ltd as an SME, this step may serve as an opportunity for securing grants or attracting partnership from likeminded investors focused on sustainability (Jabbour et al., 2010; Darnall et al., 2008).

In a nutshell, organizations adopting to ISO 14001:2015 implementation and certification has opportunity for long term growth, improve its environmental stewardship image and build stronger connections with clients, partners and investors.

2 Methodology

This section describes the methods used in obtaining data, analyzing, designing and developing the strategic roadmap for Golden riverside to implement ISO 14001:2015 and then obtain certification. Qualitative research was mainly utilized with additional supplementation from quantitative research method. The basis to use qualitative research method is to gain in-depth insight into the organizations prepedness and process which is significant in customizing an EMS roadmap to fit Golden Riverside Ltd specific needs. While quantitative method mainly focuses on generalizing numbers and statistical data, qualitative method was used to interpret data from the semi-structured interview. The quantitative aspect focused on using already existing knowledge and research from ISO 14001:2015 to compare interview findings. This design aligns with the research objectives of assisting Golden Riverside in getting closer to the certification process. (Creswell & Creswell, 2018; Saunders et al., 2019.)

2.1 Research Method and Justification

The method of the thesis is justified by using three combined data collection methods thus semi-structured interview, document review and existing data from ISO 14001:2015 requirements with guidelines for use. The semi-structured interview allowed the questions to be guided towards key topics while remaining flexible to follow up on unexpected observations. The interviewee was further contacted for additional information and clarification on some points. Document review was also significant for understanding the organization's actual environmental aspects and impacts. This combination of methods was chosen to facilitate data triangulation that is comparing and cross-checking information from different sources which helps to improve the accuracy, trustworthiness, and depth of the findings regarding the organization's preparedness for ISO 14001:2015 implementation (Yin 2016.)

Figure 2 below further illustrates the methodological flow, clarifying how the semi-structured interviews and document reviews were integrated to ensure data triangulation by comparing findings with existing data from ISO 14001:2015. It visually represents how data collection occurred.

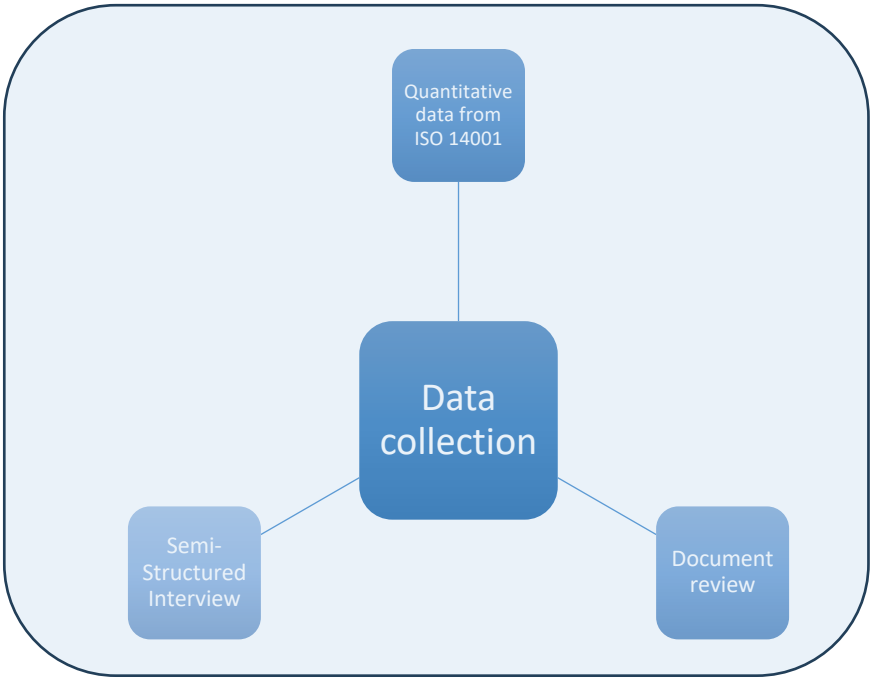

Figure 1 Data Collection flow : Own Elaboration

2.1.1 Semi-Structured interview

The initial data collection started with a scheduled semi-structured interview on December 20, 2024, with a top management representative. At this phase, only an interview with a top management representative was sufficient to understand the readiness of the organizations. The top management representative was suitable for this interview due to their influence in terms of decision-making over resource allocation and EMS implementation.

Due to logistical constraints, the interview was conducted remotely, a method endorsed by the National Environmental Science Program NESPL (2017) as a feasible alternative compared to a physical assessment in case a physical assessment was deemed inconvenient. The interview began with open-minded questions and gradually delved into questions related to energy and water consumption monitoring data, compliance obligations, etc. Additionally, Saunders et al. (2019) attests the flexibility of using semi-structured interviews to adapt questions based on responses, ensuring rich and relevant data.

Following the initial semi-structured interview, follow-up questions were asked to clarify specific points, such as more details about compliance with the Environmental Protection Agency (EPA) of Ghana's requirements. The follow-up questions were conducted in a less formal manner also known as a "digital textual interview," which is a form of qualitative methods. Researchers James and Busher (2006) asserts the benefits of text-based interviews, highlighting their ability to elicit thoughtful responses and reduce interviewer bias. According to Corbin and Strauss (2015) in their grounded theory research, using a less formal method of data collection aligns with adaptive data collection strategies, where iterative questioning refines findings.

2.1.2 Document Review

Secondly, the document review process was conducted to supplement the interview data by critically reviewing the available key records that Golden Riverside Ltd provided. During this phase, a number of documents were specifically requested to be visually inspected. Because of logistical constraints , the requested substances were sent electronically for review. Among these were utility records from water bills, electricity consumption bills and current certification documents of the Global GAP and LEAF. The selected documents were evaluated for their relevance to ISO 14001: 2015 requirements, especially the elements related to the documented environmental policies (clause 5.2) and measurable environmental objectives (clause 6.2). (ISO, 2015.)

This selective approach is based on a principle proposed by Kabir et al. (2016), which emphasizes gathering data that allows gaps in previous research to be addressed. In this case, the absence of documented policies and objectives that are considered fundamental to

auditing readiness. The document review served as a diagnostic tool assisting in a full gap analysis between the organization's current environmental practices and certification standards (Zutshi & Sohal 2004.)

2.1.3 14001:2015 documents

Finally, data generated from qualitative methods were compared to documents from ISO 14001:2015 standards for contrast. This comparison is significant for providing the research with a more tangible breakdown and conclusion, as the same ISO 14001:2015 will ultimately be the standard to which Golden Riverside Ltd adheres. The use of this standard facilitated a more systematic and impartial assessment concerning internationally accepted environmental standards. This aligns with the studies by Delmas and Toffel (2004), which illustrates the merits of using formal standards as a benchmark when investigating the efficacy and maturity of environmental management systems use. Utilizing ISO 14001:2015 in this way not only strengthens the credibility of the findings but also positions the company to better anticipate and meet the expectations of certifying bodies.

2.2 Content Analysis

Firstly, audio data from the semi-structured interview was transcribed into text using Otter AI, which enhanced content analysis. This tool helped save time and reduce errors. The text was then carefully checked for manual accuracy. The next phase of the process required highlighting and sorting important themes into smaller topics or "codes." These codes were derived from the expressions made during the interview. The codes were subsequently grouped into larger themes, namely "compliance gaps" and "resource allocations," which helped elaborate on the key issues the organization may face in achieving ISO 14001 certification. Finally, these themes were compared with ISO 14001 requirements to identify what the organization has not implemented and what steps are necessary to meet the required standard level. This process aligns with the research of Mayring (2021) regarding the systematic steps involved in qualitative content analysis—from transcription and coding to theme development and interpretation.

The overall process of transcription, coding, categorization, and interpretation, which reflects the step-by-step approach to quantitative analysis as asserted by Mayring (2021), is visually illustrated in Figure 3 below.

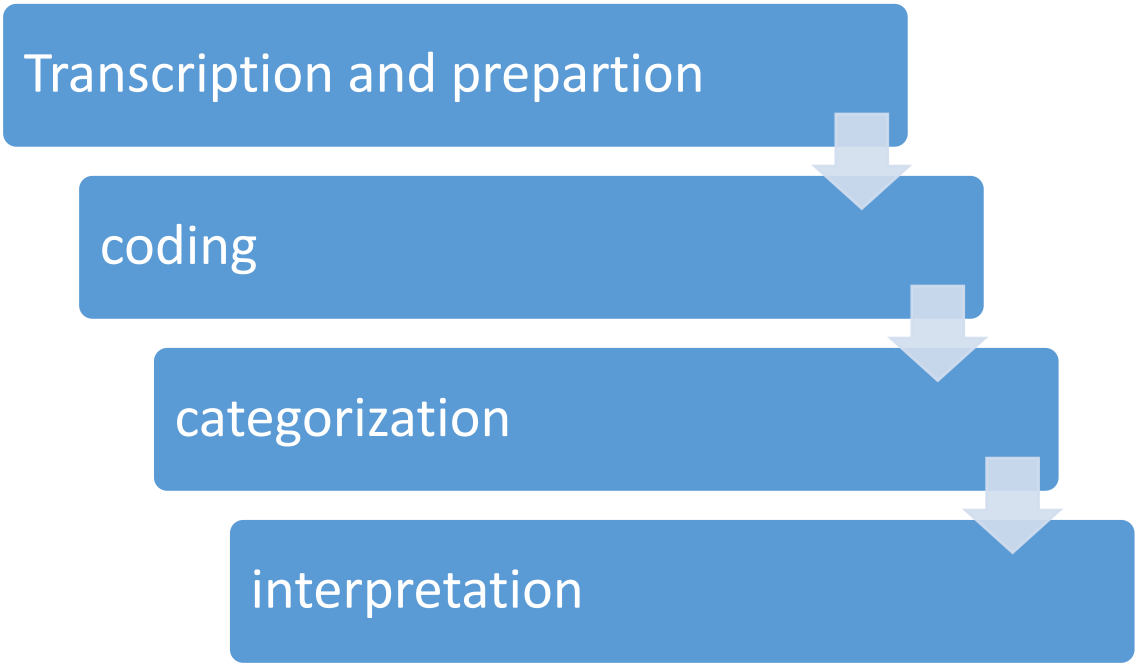

Figure 2 Content Analysis process : adapted from Mayring, (2021).

The next step in the analysis process thus reviewing the document provided. During this phase, key documents- such as utility bills for water and electricity and certifications by Golden Riverside Ltd- were checked. These documents were analyzed to identify patterns in resource use that could reveal inefficiencies. Clause 9.1.1 of ISO 14001:2015 emphasizes the importance of monitoring environmental performance, making this review essential for measuring sustainability progress. Additionally, LEAF and Global GAP certifications were checked for compliance with environmental standards, aligning with Clause 6.1.3 of ISO requirements. Zobel (2015) asserts that reviewing documents is a good way to assess how organizations upholds its commitments to improve in a continuous manner.

Furthermore, in the content analysis phase, the data that was retrieved from the semi-structured interviews including the document review was compared against the 10 clauses of ISO 14001:2015. Th e aim of this phase is to highlight the gaps in the organizations existing environmental management practices. For instance, the absence of an environmental policy aligns with clause 5.2 whiles absence of a measuring and monitoring device for consumption of water data aligns with clause 9.1.1. This helped to transform the raw data from the interview into meaningful insight that could identify non-conformities, areas for improvement and areas of opportunity to match with existing practices of ISO 14001:2015 requirements. It also helped in how to prioritize corrective actions to improve the organizations readiness. This step deepens the understanding of the coded findings and helps it to bring it to practical application according to Marying (2021).

3 Results

The results section presents key findings obtained from the Semi-structured interview that will be put into significant consideration when creating the strategic guidelines for the organization. The data was mostly obtained via the semi-structured interview but later it was realized that there's a need for further clarifications. Subsequent clarifications were asked via text messages and some documents were also sent via text message as proof. The common themes were identified using Marying, (2021) qualitative content analysis method.

3.1 Thematic analysis results

Key themes were obtained via semi-structured interview to reveal the current operational practices of the organization such as commitment to environmental compliances, workers training on environmental issues, environmental objectives and how they are being monitored. These key points highlight what the agribusiness is currently doing, what it aims to achieve, and where improvements are needed to meet ISO 14001:2015 requirements. Table (3) below provides an overview of these themes and includes direct quotes from the interview to support the analysis.

Table 3: Thematic analysis results

Theme	Description	Quotes from the interview
Regulatory compliance and certified Goals	The company's aim is to align with Global GAP, Leaf standards and ISO 14001:2015, EU regulations etc.	"It will help us to cooperate with EU regulations so we can become greener, stay in the competitive market and prove our environmental stewardship."
Current Environmental practices and Gaps	While the business lacks has basic compliance in place, it lacks structured tracking system, documented policies and data of employee training	"We've got the basic of compliance well done, but we can do better in the context of tracking with modern technology and documented data"
Environmental Targets and objectives	The company aims to reduce water consumption by 15%, eliminate chemical use and start with the separation of recycled materials	"We are dedicated to decreasing water consumption by 15%, reduce the use of dangerous pesticide by 2026"
Data collection and monitoring systems	While the company collects basic data on water and energy use, it lacks digital tracking mechanism.	"We have data, but we do not store it in any special database for performance evaluation"
Gap analysis and continuous improvement	The company has conducted gap analysis and identified key areas for improvement	"We found some gaps like we should have a formal

		environmental policy and should be available to everyone”
Employee and stakeholder engagement	Employees participate in basic environmental duties but there’s a need for planned training.	“Employees do not yet separate waste yet but it’s the responsibility of management to provide different waste bins and label them for employees”

Thematic analysis was used to identify common patterns from the semi-structured interview data. This qualitative research method is widely used to explore people's experiences and perspectives about a particular topic. “Thematic analysis can be a useful and flexible method for qualitative research, according to Braun & Clarke (2006).

3.2 Document analysis findings

Key materials examined in the analysis process included utility data for water usage and electricity, as well as certifications possessed by Golden Riverside Ltd. Such a review could help identify patterns and inefficiencies in resource use and highlight key areas for improvement in sustainability practices.

Firstly, upon reviewing the documents, it was found that the organization does not keep records of its water consumption because its water supply system consists of a manually constructed well from which groundwater is pumped for use in all operations. There are no metering devices in the system; therefore, precise numbers on water use are unavailable. Estimated usage records were maintained informally in handwritten logs kept by staff. These estimates were derived from observed pump run times, as well as the frequency and amount of water used for different farm activities. These records are neither standardized nor verified by instrumentation, but they provide a general sense of resource usage patterns. Notably, staff recorded higher water availability during the rainy season (May 2024–August 2024) when groundwater recharge is maximal. While such records do not constitute formal data collection, their existence implies an internal sense of environmental resource use, one that partially adheres to ISO 14001:2015 Clause 9.1.1, which addresses monitoring, and Clause 6.1.3, considering environmental aspects and associated risks.

The records also indicated that the farm has transitioned from using fuel-powered generators to utilizing hydro-powered electricity since 2022. This is a step in the right direction for more sustainable energy consumption. ISO 14001:2015 Clause 6.1.2 highlights that the use of renewable energy contributes to reducing environmental impact and that very objective can be achieved through a switch to clean energy sources. According to the U.S. Energy Information Administration (2023), hydropower plants do not produce direct air pollutants, which helps improve air quality and reduces environmental and human health risks. Moreover, according to the records available, there were no signs of significant inefficient electricity

use. This is in accordance with ISO 14001:2015 Clause 9.1.1, which emphasizes Monitoring, measurement, analysis, and evaluation of environmental performance.

Secondly, the certification and compliance assessment revealed that the company's environmental certifications were still valid at the time of the check. One of these documents is a legally required document from the Ghana's Environmental Protection Agency (EPA), as well as LEAF and Global GAP certificates. The document from Ghana's EPA requires the organization to make mandatory report on their Environmental Impact Assessment (EIA) plans. This requirement aligns with Clause 6.1.3 of ISO 14001:2015 which focuses on the importance organizations to evaluate and address their environmental risk and opportunities.

4 Discussions

The discussion phase involves focusing on the main aspects of key findings related to the research questions and thesis objectives. It also focuses on the importance of ISO 14001:2015 introduction to the agricultural sector. Although Golden Riverside Limited is not yet ISO 14001:2015 certified, benchmarking its current environmental practices against the standard's requirements serves as a proactive way to a strategic approach. The findings will be contrasted against ISO 14001, emphasizing trends and gaps. This approach will illustrate how the results align with these ISO standards and will also showcase strengths and areas for improvement. The results will provide valuable insights for advancements in environmental practices for the case organization.

According to Darnall et al. (2008), comparing the findings against ISO 14001:2015 clauses positions them better for identifying improvements and reducing risks. Their studies emphasize that evaluations are essential for identifying non-conformities and fostering a culture of continual improvement, which supports long-term sustainability and compliance. The discussions will be summarized in Table 4 below, comparing the results to the specific clauses of ISO 14001:2015.

Table 4: Comparison of Clauses with Findings.

Clause Name	Clause number	Discussion from findings
Context of the Organization	4.1 & 4.2	Internal Context: Golden Riverside has basic compliance and compliance with Ghana's EPA with environmental regulations but on the other hand lacks structured systems for tracking performance (energy and water usage), documented environmental policies and environmental objectives etc... They aim to reduce water use by 15% and eliminate harmful pesticides by 2026. External Context: The company seeks to align with global standards like Global GAP, Leaf, and ISO 14001:2015, and comply with EU regulations to stay competitive and prove environmental responsibility.
Leadership	5.1 & 5.3	The leadership at Golden Riverside demonstrates commitment to environmental sustainability and aiming to improve on it to align with international standards. The leaders are dedicated to setting clear environmental objectives and abiding by it, such as reducing water use and disposing waste properly, which shows their involvement in defining objectives. However, it's important to have environmental policies and improving employee engagement in sustainability practices. Additionally, the management acknowledges the importance of providing the necessary resources and training to achieve these objectives but recognizes gaps in execution.
Planning	6.1 & 6.2	Golden Riverside has already identified some environmental risks and opportunities, such as the need to reduce water consumption and eliminate harmful pesticide use. This is in accordance with Clause 6.1, which requires organizations to assess environmental aspects and determine their impacts. This is also a requirement from the EPA of Ghana according to the management.

		The organization lacks a digital monitoring system may hinder their ability to track and environmental performance against the set targets.
Support	7.1, 7.2, 7.3, 7.4 & 7.5	Golden Riverside has identified the need for better resources to support its environmental targets, such as system for tracking environmental performance. While employees are aware of basic environmental duties, there is a need for more training to improve their skills and knowledge. The organization should do more in terms of communication to its workers in terms of practices that doesn't improve environmental health. However, they currently lack formal channels for communication across the organization. As explained earlier there is also a gap in having documented information, as there is no formal system to store and track environmental data. To improve, they need a system for managing documents and tracking performance like ESG software. These areas of support are critical for meeting the company's environmental goals effectively.
Operations	8.1 & 8.2	Golden Riverside aims to set clear environmental goals, like using clean energy and disposing waste properly. However, it will be ideal to have a system that can track and control these operations effectively. While they collect basic data, they don't have a structured way to store and evaluate it to determine performance.
Performance Evaluation	9.1, 9.2 & 9.3	Golden Riverside Ltd. needs to strengthen its approach to evaluating environmental performance to meet ISO 14001:2015 standards. The company should set clear criteria for monitoring key environmental aspects, such as water and energy use, to assess performance regularly.
Improvement	10.1 & 10.2	Improvement should be in a continual approach whereby short-term goals can be in a manner that the organization can achieve them within. Golden Riverside should conduct subsequent gap analysis and make plans to mitigate those gaps in a continual approach.

The discussion of the findings, based on the interview and ISO 14001:2015 clauses, reveals that Golden Riverside Limited is committed to enhancing its environmental performance and complying with all required international standards.

Lack of documented environmental policy, lack documented environmental objectives and a proper system to for monitoring and tracking of performance were the three main gaps which intend emerged across different areas of the standard. These gaps are significantly important during first stage certification audit and could therefore hinder the organization's ability to succeed in the process. Zutshi and Sohal (2004) highlighted the importance of a clear documentation and performance monitoring presents a hindrance to effectively implement ISO 14001:2015 effectively.

5 Recommendations

This section discusses the key findings from chapter 4 and evaluates how it aligns with the research objectives from chapter 1.4. The purpose is to present practical recommendations in the form of proposals to assist Golden Riverside Ltd in deciding to move forward with ISO 14001:2015 certification. Pursuing certification is a strategic decision that comes with potential risks of threats and opportunities. While certification can improve the company's environmental performance, it can strengthen its reputation, and opens up new business opportunities, it also poses risks, including financial constraints, as explained in the chapter 1.10 about the challenges in implementing ISO 14001 in the agriculture industry. The organization must plan and be aware of the use of resources, as well as the internal changes that the company must be ready to manage. Since this is the company's first experience with any ISO certification, it's important to build a clear understanding of what the process involves comprehensively. According to Simon et al. (2012), properly assessing risks in environmental management systems helps organizations identify both threats and opportunities, making it easier to act in a smart, forward-thinking manner.

Cost-benefit analysis and benchmarking would be the first recommended step for Golden Riverside Ltd to consider before making a bold decision on how to proceed with the certification process. The organization should benchmark other agribusinesses that are ISO 14001:2015 certified and consider the risk of threats and opportunities it gives to them. Other financial factors that needs to be considered is the cost in obtaining the certification and maintaining it in a long term. It's also important to consider if the stakeholders would recognize the significance of ISO 14001:2015. Camilleri (2022) suggest the need for a cost benefit analysis for organizations that shows interest in the certification of ISO 14001:2015. Treacy et al. (2019) also suggests the need for benchmarking with business competitors as a strategic and financial benefit as it demonstrates how ISO 14001:2015.

Furthermore, adopting a risk management approach for implementation such that the organization can implement the requirements of the standard within some specific time, make continual improvements. This will assist the organization to have a qualitative assessment in implementing the standard. The need to identify the adoption of ISO 14001:2015 to enhance its ability to identify risks and mitigate them proactively. The risk management approach stems from assessing the risk of not implementing ISO 14001:2015, how it can be useful in mitigating compliance risk and boosting market competitiveness. Ignoring environmental standards can result in higher costs and damage to an organization's reputation over time. Gimenez and Tachizawa (2012) explains that understanding these risks helps organizations determine if certifications are necessary and take steps to prevent negative effects.

Finally, Golden Riverside Ltd needs to integrate digital measurement tools for resource tracking. To enhance resource management, it is recommended that Golden Riverside Ltd explores the need for Environmental Social Governance (ESG) and data analytics platform to help track resource consumption for environmental performance. Digital tools can offer real-time monitoring of environmental metrics, which is important for compliance with standards. Utilizing digital tools in real time can make it easier for the organization to identify inefficiencies, evaluate its environmental impact, and make necessary adjustments to support continuous improvement.

5.1 Thesis deliverables

This thesis presents three key deliverables: the proposed environmental objective, the proposed environmental policy, and an audit checklist tool, which can be found in Appendix 2. Each of these components has been carefully developed to meet the current needs of Golden Riverside Limited. However, they are designed with flexibility in mind, allowing the organization to further tailor them to better align with its specific context and evolving requirements. As per ISO 14001:2015 clauses 5.2 and 6.2, it's a requirement for organizations seeking certification to have a well-defined environmental policy that aligns with the environmental objectives.

5.1.1 Proposed Environmental objective

Below is a proposed environmental objective with targets that Golden Riverside Limited can adopt and modify to fit its operations. The organization can further customize these objectives to better align with its specific needs and goals regarding the environment sustainability. Table 5 presents the proposed environmental objectives for Golden Riverside Ltd which is in line with ISO 14001:2015 requirements.

Table 5: Proposed Environmental Objectives for Golden Riverside Limited

Objective NO.	Environmental objective	Target	Time frame	Actions and responsible Department
EO-01	Reduce water consumption	20%	2 years	Use modern irrigation systems to know when and how to conserve water for dry seasons
EO-03	Use eco-friendly Agro-products and chemicals	20%	2 years	Use recommended chemicals that aligns with export destination of products
EO-03	Trian employee and awareness	100%	2 years	Ensure that all new employees are aware of environmental performance and their significant to the environment
EO-04	Reduce energy consumption	20%	3 years	Measure energy consumption and do Gap analysis on how to save energy and energy cost
EO-05	Promote sustainability packaging	50%	2 years	Avoid the use of single use plastics and separate waste for recycling

5.1.2 Proposed Environmental Policy

Below is a proposed environmental policy that shows Golden Riverside Limited's commitment to sustainability and meeting ISO 14001:2015 standards. The policy can be changed to better fit the organization's needs and can be updated as the company's environmental goals grow. Figure 3 illustrates the proposed environmental policy in a visual format to make it easy to enhance readability.

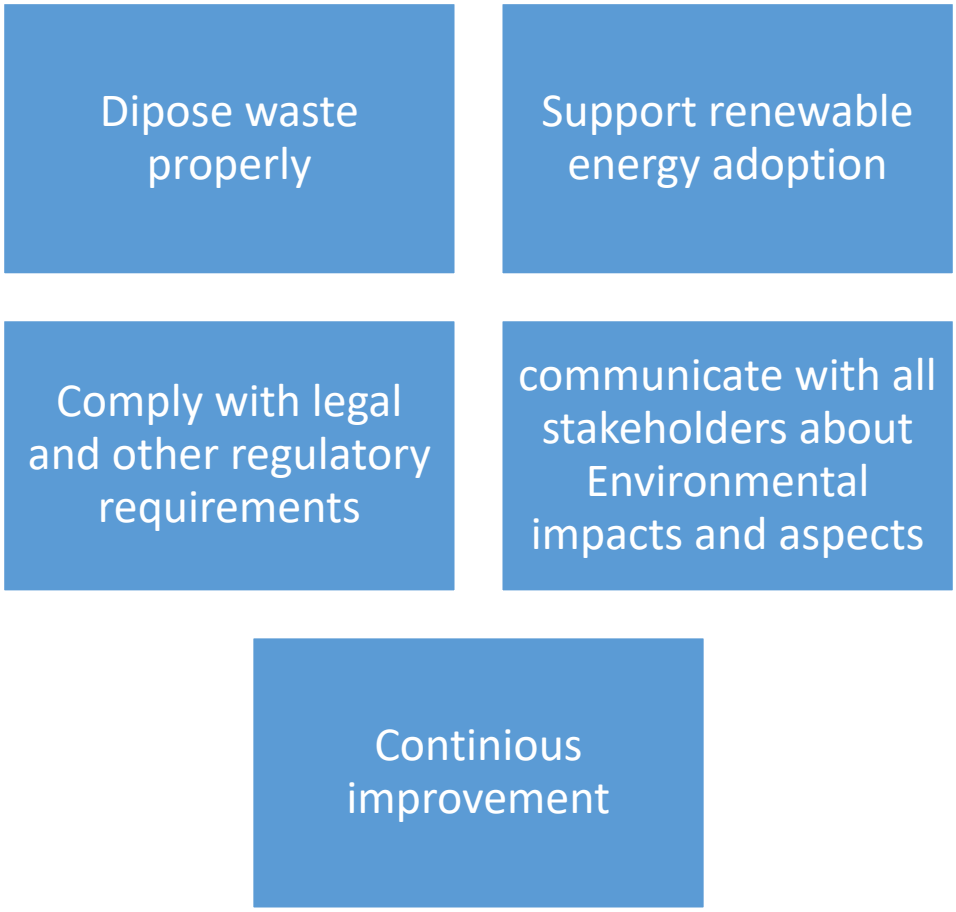

Figure 3 Proposed Environmental Policy (Adapted from Advisera)

6 Conclusion

This thesis was commissioned to assist Golden Riverside Ltd. in understand what ISO 14001:2015 certification involves and whether it would be a good step forward to obtain the certificate. The goal was to give clear guidelines and steps the company can follow to meet the certification requirements and also get closer to the certification process. To progress, the research looked closely at the ISO 14001:2015 standard and compared it to what Golden Riverside Ltd. is current operations. Interview with management representative and a review of documents helped to identify what the company is already doing positively, what can be done better and understand the gaps in the system for standard compliance.

The study found that the organization is interested in getting certified for several reasons but needs to follow strategic guidelines by carefully assessing the risks involved, partially relying on the gaps revealed in this thesis process to plan ahead. These include following EU regulations, staying competitive in the market, and demonstrating environmental stewardship to boost confidence in stakeholders. There are also business benefits such as saving costs and

reaching more customers especially those that are concerned about environmental sustainability. Interview feedback, and documents showed that the company is already taking some steps, like switching from using fuel generators to using hydro powered electricity for energy and managing waste properly which also align with Global GAP and LEAF standards. However, the research also revealed some gaps in the organization concerning ISO standards. There is no formal environmental policy documented, which is required by the standard. The organization is also not tracking progress effectively, has no documented environmental objective.

Getting ISO 14001:2015 certification from a recognized certification body will demonstrate the organization's seriousness about environmental stewardship. While the certification alone does not guarantee sustainability by itself, it proves that the company is following a solid system. The company and its partners must work together and fully follow the ISO system to make this work if possible; this can be a long-term goal. This research focused solely on Golden Riverside Ltd., so the findings may not be applicable to all organizations, even within the agriculture industry. Additionally, some actions, such as testing how the entire certification process will fit properly into the organization, could not be completed due to limited time and resources.

6.1 Validity and ethical considerations

The validity of this research is reflected by the methodology used and data collection. Regarding internal validity, the study focused on semi-structured interviews with representatives of the top management level that have a deep understanding of what is the core part of the organization’s operations. This ensured that the information the thesis is based on is genuine insights by the participants, not assumptions. Using a qualitative research method further strengthens internal validity by allowing detailed and direct responses. The interview process used open-ended questions and direct application of the ISO clauses to reduce researcher bias to ensure that the data collected into information truly reflects the participants view and aligns with the ISO 14001 framework.

Regarding ethical considerations, the study followed strict ethical guidelines. Before the scheduled semi-structured interviews, top management was given clear indication about the study and told that the content may be published online. After the interviews, the top management representative was contacted via SMS, with their consent, to clarify or add more details to their answers. This follow-up approach is not usually formal but was considered appropriate because of the good relationship with the participant. No sensitive or harmful questions were asked that could cause reputational damage risk for the organization. All data, including SMS messages, was securely stored and accessible only to the researcher.

6.2 Future Research needs

The thesis offered useful recommendations to help Golden Riverside Ltd decide whether ISO 14001:2015 certification is a strategic step forward. It pointed out key areas the company needs to improve to meet the standard framework. However, there are still other important dimensions that future research could explore to better support sustainability for Golden Riverside Ltd. For instance, future research would be in a better position if it included the opinions of more stakeholders who are involved with the organization and beyond in different ways, not just managers, but also workers, customers, suppliers, and local authorities. These stakeholders also play a significant role in determining the opportunities and threats that come with obtaining ISO 14001 certification. By interviewing this wider group of stakeholders, researchers can better conclude what ISO 14001:2015 means to different stakeholders. For example, some might see it as a way to protect the environment, while others might care more about business growth or following the law (Delmas 2001).

Additionally, future research could look into more details how ISO 14001 affects environmental performance, operating costs, etc... Benchmarking, the results with other agribusinesses or related organization, and comparing their experiences would help show what works best and what common problems they face as asserted by Zutshi & Sohal (2004) on how to examine in more detail how ISO 14001 influences environmental performance, operating costs, and other outcomes. The future research can also investigate how ISO 14001:2015 could integrate into other management systems like ISO 45001 and how it influences human factors especially in employee engagement and the organizations behavior during environmental system implementation.

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Figures

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Tables

Appendix 1: Semi-structured Interview Questions

These interview questions were designed for the management representative of Golden Riverside Ltd. to help collect data for this thesis methodological process. The goal of the interview was to learn about the company's current environmental practices, their knowledge of ISO 14001:2015, and their readiness to start using it. The questions were based on the main components of the ISO 14001:2015 standard and aligned with the goals of the thesis. A semi-structured interview style was employed to facilitate open conversation and enhance understanding topic. Why is your organization interested in using ISO 14001 guidelines for environmental sustainability stewardship?

What do you think — how well do your current systems reflect Global GAP and LEAF standards?

What is the Main challenges encountered while trying to improve environmental practice?

Do you have any explicit environmental targets/ environmental objectives? If so, what are they?

Follow-up question: So do you have any data that you can use to check energy consumption?

How do employees participate in maintaining environmental risks in the farm?

Have you had a gap analysis performed to determine what's lacking for ISO 14001?

What systems do you have for tracking your environmental performance?

What kinds of steps are you taking to prepare for environmental emergencies?

How do you engage stakeholders—such as local authorities or suppliers—in your environmental agenda?

What are your expectations from certification for ISO 14001?

What are the key objectives you want your environmental sustainability policy to accomplish?

How do you intend to publicize and use the policy?

What types of manuals or documents do you think are necessary to implement the policy?

How will you make sure employees and stakeholders abide by the sustainability policy?

How will you monitor and review the success of your sustainability policy

The Table below is a sample internal Audit checklist with key management clauses drafted based on the requirements of ISO 14001:2015 to assist Golden Riverside Ltd to evaluate their conformance with the standard.

Appendix 2: EMS Audit Checklist Tool

1. Environmental Policy & Legal Compliance

Audit Questions	Yes	No	Remarks/Actions Required	Clause No.
How often do you review your Environmental Policy?	☐	☐	Major non-conformity	5.2
Is the Environmental Policy communicated to all employees?	☐	☐	Major non-conformity	7.4
Is the company compliant with Ghana's current EPA regulations?	☐	☐	Conformity	6.1.3
Does the farm comply with EU pesticide residue limits? By what means, what is the residual limit and how much do you use?	☐	☐	Conformity	8.1
Are all required environmental permits/licenses available and up to date?	☐	☐	Conformity	6.1.3

2. Environmental Objectives & Targets

Audit Questions	Yes	No	Remarks/Actions Required	Clause No.
Are there documented SMART environmental objectives?	☐	☐	Conformity	6.2.1
Is progress towards achieving objectives monitored and reviewed?	☐	☐	Major non-conformity	9.1.1

If there's progress, prove with documented data				
Are employees aware of the farm's environmental goals? How often do you offer training and communicate issues regarding Environmental targets	☐	☐	Major non-conformity	7.3

3. Risk Assessment & Mitigation Strategies

Audit Question	Yes	No	Remarks/Actions Required	Clause No.
Has the farm conducted an environmental risk assessment?	☐	☐	Major non-conformity	6.1.1
Are mitigation strategies in place for pesticide use and water pollution?	☐	☐	Conformity	6.1.4
Are measures in place to prevent soil degradation and erosion?	☐	☐	Conformity	6.1.2
Is there a waste management plan for organic and non-organic waste?	☐	☐	Conformity	8.1

4. Resource Management (Water, Energy, Waste)

Audit Questions	Yes	No	Remarks/Actions Required	Clause No.
Is water usage monitored and optimized? Is there any data to proof this?	☐	☐	Conformity	9.1.1

Does the farm currently use efficient irrigation systems (e.g., drip irrigation)?	☐	☐	Major non-conformity	8.1
Are measures in place to reduce energy consumption?	☐	☐	Conformity	8.1
Are recycling and composting practices implemented?	☐	☐	Major non-conformity	8.1

5. Training & Employee Awareness

Audit Questions	Yes	No	Remarks/Actions Required	Clause No.
Have employees received environmental awareness training?	☐	☐	Conformity	7.2
Are workers aware of roles in the EMS?	☐	☐	Conformity	7.3
Is there manual on ISO 14001 compliance?	☐	☐	Major non-conformity	7.2

6. Emergency Preparedness & Response

Audit Questions	Yes	No	Remarks/Actions Required	Clause No.
Is there an emergency response plan for chemical spills or accidents?	☐	☐	Conformity	8.2

Are emergency drills conducted and tested regularly?	☐	☐	Conformity	8.2
Are there processes for handling chemical spills?	☐	☐	Major non-conformity	8.2

Audit Summary & Recommendations:

Non-Compliant Areas & Corrective Actions:

The checklist tool in Table 6 is developed based on ISO 14001:2015 guidelines (ISO, 2015) and integrates best practices from academic literature (Asif et al., 2013; Boiral et al., 2018; Hillary, 2017)