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Sustainability Assessment of Food Production Systems and Agriculture for Agribusiness in Ismailia, Egypt

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Abstract

This research aimed to assess the sustainability of agricultural systems and food production in Ismailia, Egypt by comparing the application of SAFA (Sustainability Assessment of Food and Agricultural Systems) indicators. Using the SAFA method for measuring the level of sustainability for Agribusiness in Ismailia; SAFA methodology is structured based on different hierarchical levels: dimensions, themes, sub-themes, and indicators. The more general level includes four dimensions of sustainability: good governance, environmental integrity, economic resilience, and social well-being. The results showed that there are differences that are sometimes marked between the levels of sustainability achieved by the 15 enterprises in the following themes: in “Corporate Ethics” most enterprises have reached a good level, as the company tends toward sustainable practices; few enterprises have achieved a moderate level, since their mission is not focused on sustainable development but on maximizing production. Regarding the theme “Atmosphere”, most enterprises have reached a good level, as they use machinery with consequent emissions of greenhouse gases and chemicals that can interfere with the air quality. In the theme “Water”, most enterprises obtained a good score because they use chemical substances that can interfere with water quality, and the water is taken in abundance from the neighboring water bodies to irrigate the plantation. In “Investment”, In “Decent Livelihood”, Most enterprises have reached good levels, since the work shifts are heavy, leaving few times for rest; finally, in “Labor Rights”, most enterprises have reached the best levels because most employees have regular contract and social security provisions.

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Keywords: SAFA, Sustainability, Assessment, FAO, Agribusiness.

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تقييم استدامة نظم الإنتاج الغذائي والزراعة للشركات الزراعية في الإسماعيلية، مصر

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الملخص العربي:

يهدف هذا البحث إلى تقييم استدامة النظم الزراعية وإنتاج الغذاء من خلال مقارنة تطبيق مؤشرات SAFA علي مستوى الشركات الزراعية في الاسماعيلية، مصر. استخدام طريقة SAFA لقياس مستوى الاستدامة في الإسماعيلية؛ يتم تنظيم منهجية SAFA على أساس مستويات هرمية مختلفة: الأبعاد والموضوعات والمواضيع الفرعية والمؤشرات. ويتضمن المستوى الأكثر عمومية أربعة أبعاد للاستدامة: الحكم الرشيد، والسلامة البيئية، والمرونة الاقتصادية، والرفاهية الاجتماعية. وأظهرت النتائج أن هناك فروقاً ملحوظة أحياناً بين مستويات الاستدامة التي حققتها المنشآت الخمسة عشر في الموضوعات التالية: في "أخلاقيات الشركات"، وصلت معظم المنشآت إلى مستوى جيد، حيث تتجه الشركة نحو الممارسات المستدامة؛ وقد حققت بعض المؤسسات مستوى معتدلاً، لأن مهمتها لا تركز على التنمية المستدامة بل على تعظيم الإنتاج. وفيما يتعلق بموضوع "الغلاف الجوي"، فقد وصلت معظم المؤسسات إلى مستوى جيد، حيث أنها تستخدم الآلات التي يترتب عليها انبعاثات الغازات الدفيئة واستخدام المواد الكيميائية التي يمكن أن تؤثر على نوعية الهواء. وفي موضوع "المياه"، حصلت معظم المؤسسات على درجة جيدة لأنها تستخدم مواد كيميائية يمكن أن تتداخل مع نوعية المياه، ويتم أخذ المياه بكثرة من المسطحات المائية المجاورة لري المزروعات. وفي «الاستثمار»، وفي «العيش الكريم»، وصلت معظم المنشآت إلى مستويات جيدة، حيث تكون نوبات العمل كثيفة، ولا تترك سوى أوقات قليلة للراحة؛ وأخيراً، في "حقوق العمل"، وصلت معظم المؤسسات إلى أفضل المستويات لأن معظم الموظفين لديهم عقود منتظمة وأحكام الضمان الاجتماعي.

الكلمات المفتاحية: الاستدامة، التقييم، منظمة الأغذية والزراعة، الشركات الزراعية، الإنتاج، الأنظمة، الغذاء

INTRODUCTION:

According to the latest population census in Egypt, the population living along the Nile's narrow strip now stands at 95 million, a significant increase compared to previous records (Abdel Monem & Radojevic, 2020). With the country's population rapidly expanding, coupled with limited water resources and a reliance on food imports, there's a pressing need for a comprehensive agricultural policy (Pérez-Lombardini et al., 2021; Soldi et al., 2019). Egypt is presented with a rare opportunity to focus on specific sectoral policies, particularly in agriculture, following recent economic reforms like the flotation of the Egyptian pound, introduction of value-added tax, and reduction in energy subsidies (Kassim et al., 2018).

Globally, pastoralism supports twenty million households and contributes to 10% of the world's meat production (Blench, 2001). It heavily depends on rangelands with natural vegetation, making it prevalent in regions where traditional cultivation is challenging, such as desert areas, mountains, the Middle East, and Sub-Saharan Africa (Derkimba et al., 2015).

THE PROBLEM OF THE STUDY:

Egypt strives to enhance the well-being of its populace by offering rewarding employment prospects and ensuring access to quality healthcare and education. Despite the nation's commendable economic growth rates, there remains an imbalance between the prudent utilization of environmental resources and the implementation of development initiatives to improve the overall quality of life for all citizens. Numerous obstacles hinder achieving sustainable development in Egypt, which entails fostering economic and social progress in a manner that

harmonizes with environmental considerations for the benefit of future generations. Infrastructure has an impact on sustainable development, whether it is directly or indirectly.

OBJECTIVES:

The objective of this study is to evaluate the sustainability of agricultural systems and food production for agribusiness in Ismailia, Egypt, by comparing them with the Sustainability Assessment of Food and Agricultural Systems (SAFA) indicators developed by the Food and Agriculture Organization of the United Nations (FAO). Specifically, the research aims to achieve two main goals:

- 1- Assessing the level of sustainability of all agribusinesses in Ismailia, Egypt: This involves identifying the relative strengths and weaknesses concerning various sustainability issues outlined in the SAFA indicators.
- 2- Identifying critical issues for each farm classification: This entails analyzing the SAFA indicators to pinpoint key challenges faced by different types of farms in Ismailia, Egypt, and providing strategies to enhance sustainability in agriculture and food production.

RESEARCH METHODOLOGY:

The present study employs the Sustainability Assessment of Food and Agricultural Systems (SAFA) method to assess the sustainability level of Egyptian agriculture. This method is notable for its comprehensive range of sustainability dimensions, its applicability to both large and small farms worldwide, and its user-friendly nature. Developed by the Food and Agriculture Organization of the United Nations (FAO) in 2012, SAFA primarily focuses on agri-food and rural systems, aiming to evaluate the sustainability degree of agricultural holdings and offer a set of

indicators to aid private and public entities in identifying issues and proposing solutions.

The SAFA methodology is structured hierarchically, encompassing dimensions, themes, sub-themes, and indicators. At the highest level, there are four dimensions of sustainability: good governance, environmental integrity, economic resilience, and social well-being. The intermediate level includes 21 sustainability themes, further delineated into 58 sub-themes. At a more granular level, each sub-theme incorporates various indicators, totaling 116, which can be evaluated using a performance score ranging from 1 to 5 (FAO, 2014a). Sustainability practices are Table 1 for an overview of the SAFA themes included in the analysis).

classified on a scale from unacceptable (red) to best (dark green) using a traffic light color code (Cammarata et al., 2021).

The assessment was conducted by SAFA Guidelines version 3.0 (FAO, 2014a), which provide instructions on the assessment's purpose, procedures, and themes and sub-themes. SAFA indicators were selected based on a review of technical-scientific documents, aligning with the research objectives and data availability.

Considering the context of Ismailia, Egypt, and data availability, 90 SAFA indicators (FAO, 2013) were chosen out of a total of 116 to conduct the sustainability assessment (refer to

Table 1: Selected Sustainability Assessment of Food and Agriculture Systems (SAFA) indicators

Themes	Analyzed	Not Analyzed
Sustainability Dimension G: GOOD GOVERNANCE		
G1 Corporate Ethics	√	
G2 Accountability***		×
G3 Participation	√	
G4 Rule of Law	√	
G5 Holistic Management***		×
Sustainability Dimension E: ENVIRONMENTAL INTEGRITY		
E1 Atmosphere	√	
E2 Water	√	
E3 Land	√	
E4 Biodiversity	√	
E5 Materials and Energy	√	
E6 Animal Welfare*		×
Sustainability Dimension C: ECONOMIC RESILIENCE		
C1 Investment X	√	
C2 Vulnerability	√	
C3 Product Quality and Information**		×
C4 Local Economy	√	
Sustainability Dimension S: SOCIAL WELL-BEING		
S1 Decent Livelihood	√	
S2 Fair Trading Practices	√	
S3 Labour Rights	√	
S4 Equity	√	
S5 Human Safety and Health	√	
S6 Cultural Diversity	√	

*This theme has not been analyzed since not all the enterprises have taken into consideration breed animals.

**This theme has not been considered since in most cases, the products are sold in their natural state, so there are no processing, labeling, and traceability systems.

***Not analyzed due to the low availability of data.

Source: author elaboration on SAFA indicators.

Table 2: Sustainability Dimension G: GOOD GOVERNANCE Selected Indicators

Themes	Sub-Themes	No	Default Indicators	Analyzed	Not Analyzed
G1 Corporate Ethics	G1.1 Mission Statement	G 1.1.1	Mission Explicitness	√	
		G 1.1.2	Mission Drive	√	
	G 1.2 Due Diligence	G 1.2.1	Due Diligence	√	
G2 Account ability	G 2.1 Holistic Audits	G 2.1.1	Holistic Audits		×
	G 2.2 Responsibility	G 2.2.1	Responsibility		×
	G 2.3 Transparency	G 2.3.1	Transparency		×
G3 Participation	G 3.1 Stakeholder Dialogue	G 3.1.1	Stakeholder Identification	√	
		G 3.1.2	Stakeholder Engagement	√	
		G 3.1.3	Engagement Barriers	√	
		G 3.1.4	Effective Participation	√	
	G 3.2 Grievance Procedures	G 3.2.1	Grievance Procedures	√	
	G 3.3 Conflict Resolution	G 3.3.1	Conflict Resolution	√	
G4 Rule of Law	G 4.1 Legitimacy	G 4.1.1	Legitimacy	√	
	G 4.2 Remedy, Restoration, and Prevention	G 4.2.1	Remedy, Restoration, and Prevention	√	
		G 4.3 Civic Responsibility	G 4.3.1	Civic Responsibility	√
	G 4.4 Resource Appropriation	G 4.4.1	Free, Prior, and Informed Consent	√	
		G 4.4.2	Tenure Rights	√	
G5 Holistic Management	G 5.1 Sustainability Management Plan	G 5.1.1	Sustainability Management Plan		×
	G 5.2 Full-Cost Accounting	G 5.2.1	Full-Cost Accounting		×

Table 3: Sustainability Dimension E: ENVIRONMENTAL INTEGRITY Selected Indicators

Themes	sub-Themes	No	Default Indicators	Analyzed	Not Analyzed
E1 Atmosphere	E 1.1 Greenhouse Gases	E 1.1.1	GHG Reduction Target	√	
		E 1.1.2	GHG Mitigation Practices	√	
		E 1.1.3	gHg Balance		×
	E 1.2 Air Quality	E 1.2.1	Air Pollution Reduction Target	√	
		E 1.2.2	Air Pollution Prevention Practices	√	
		E 1.2.3	Ambient Concentration of Air Pollutants		×
E2 Water	E 2.1 Water Withdrawal	E 2.1.1	Water Conservation Target	√	
		E 2.1.2	Water Conservation Practices	√	
		E 2.1.3	ground and Surface Water Withdrawals		×
	E. 2.2 Water Quality	E 2.2.1	Clean Water Target	√	
		E 2.2.2	Water Pollution Prevention Practice	√	
		E 2.2.3	Concentration of Water Pollutants		×
E3 Land	E 3.1 Soil Quality	E 2.2.4	Wastewater quality		×
		E 3.1.1	Soil Improvement practices	√	
		E 3.1.2	Soil Physical Structure	√	
		E 3.1.3	Soil Chemical Quality	√	
		E 3.1.4	Soil Biological Quality	√	
	E 3.1.5	Soil organic Matter	√		
	E 3.2 Land Degradation	E 3.2.1	Land Conservation and Rehabilitation Plan	√	
E 3.2.2		Land Conservation and Rehabilitation Practices	√		
		E 3.2.3	Net Loss/gain of Productive Land	√	

E4 Biodiversity	E 4. 1 Ecosystem Diversity	E 4.1.1	Landscape/Marine Habitat Conservation Plan	√	
		E 4.1.2	Ecosystem Enhancing Practices	√	
		E 4.1.3	Structural Diversity of Ecosystems	√	
		E 4.1.4	Ecosystem Connectivity	√	
		E 4.1.5	Land Use and Land Cover Change	√	
	E 4.2 Species Diversity	E 4.2.1	Species Conservation Target	√	
		E 4.2.2	Species Conservation practices	√	
		E 4.2.3	Diversity and Abundance of Key Species	√	
		E 4.2.4	Diversity of Production	√	
	E. 4.3 Genetic Diversity	E 4.3.1	Wild Genetic Diversity Enhancing Practices	√	
		E 4.3.2	Agro-biodiversity in-situ Conservation	√	
		E 4.3.3	Locally Adapted Varieties/Breeds	√	
		E 4.3.4	genetic Diversity in Wild Species	√	
		E 4.3.5	Saving of Seeds and Breeds	√	
	E5 Materials and Energy	E 5.1 Material Use	E 5.1.1	Material Consumption Practices	√
E 5.1.2			Nutrient Balances	√	
E 5.1.3			Renewable and Recycled Materials		×
E 5.1.4			Intensity of Material Use	√	
E 5.2 Energy Use		E 5.2.1	Renewable Energy Use Target	√	
		E 5.2.2	Energy Saving Practices	√	
		E 5.2.3	Energy Consumption	√	
		E 5.2.4	Renewable Energy		×
E 5.3 Waste Reduction and Disposal		E 5.3.1	Waste Reduction Target	√	
		E 5.3.2	Waste Reduction Practices	√	
		E 5.3.3	Waste Disposal	√	
		E 5.3.4	Food Loss and Waste Reduction		×
E6 Animal Welfare	E 6.1 Animal Health	E 6.1.1	Animal Health Practices		×
		E 6.1.2	Animal Health		×
	E 6.2 Freedom from Stress	E 6.2.1	Humane Animal Handling Practices		×
		E 6.2.2	Appropriate Animal Husbandry		×
		E 6.2.3	Freedom from Stress		×

Table 4: Sustainability Dimension C: ECONOMIC RESILIENCE Selected Indicators

Themes	Sub-Themes	No	Default Indicators	Analyzed	Not Analyzed
C1 Investment	C 1.1 Internal Investment	c 1.1.1	Internal Investment	√	
	C 1.2 Community Investment	c 1.2.1	Community Investment	√	
	C 1.3 Long Ranging Investment	c 1.3.1	Long Term Profitability	√	
		c 1.3.2	Business Plan	√	
	C 1.4 Profitability	c 1.4.1	Net Income	√	
		C 1.4.2	Cost of Production	√	
	C 1.4.3	Price Determination	√		
C2 Vulnerability	C 2.1 Stability of Production	C 2.1.1	guarantee of Production Levels	√	
		C 2.1.2	Product Diversification	√	
		C 2.2.1	Procurement Channels	√	
	C 2.2 Stability of Supply	C 2.2.2	Stability of Supplier Relationship	√	
		C 2.2.3	Dependence on the Leading Supplier	√	
	C 2.3 Stability of Market	C 2.3.1	Stability of Market	√	
	C 2.4 Liquidity	C 2.4.1	Net Cash Flow	√	
		C 2.4.2	Safety Nets	√	
	C 2.5 Risk Management	C 2.5.1	Risk Management	√	
	C3 Product Quality and Information	C 3.1 Food Safety	C 3.1.1	Control Measures	
C 3.1.2			Hazardous Pesticides		×
C 3.1.3			Food Contamination		×
C 3.2 Food Quality		C 3.2.1	Food Quality		×
C 3.3 Product Information		C 3.3.1	Product Labelling		×

		C 3.3.2	Traceability Systems	×
		C 3.3.3	Certified Production	×
C4 Local Economy	C 4.1 Value Creation	C 4.1.1	Regional Workforce	√
		C 4.1.2	Fiscal Commitment	√
	C 4.2 Local Procurement	C 4.2.1	Local Procurement	√

Table 5: Sustainability Dimension S: SOCIAL WELL-BEING Selected Indicators

Themes	sub-Themes	No	Default Indicators	Analyzed	Not Analyzed
S1 decent livelihood	S 1.1 Quality of life	S 1.1.1	Right to Quality of Life	√	
		S 1.1.2	Wage Level	√	
	S 1.2 Capacity development	S 1.2.1	Capacity Development	√	
		S 1.3 fair access to means of production	S 1.3.1	Fair Access to Means of Production	√
S2 Fair Trading Practices	S 2.1 Responsible buyers	S 2.1.1	Fair Pricing and Transparent Contracts	√	
	S 2.2 Rights of Suppliers	S 2.2.1	Rights of Suppliers	√	
S3 labour rights	S 3.1 Employment Relations	S 3.1.1	Employment Relations	√	
	S 3.2 Forced Labor	S 3.2.1	Forced Labour	√	
	S 3.3 child labour	S 3.3.1	Child Labour	√	
	S 3.4 Freedom of association and right to bargaining	S 3.4.1	Freedom of Association and Right to Bargaining	√	
S4 equity	S 4.1 nondiscrimination	S 4.1.1	Non Discrimination	√	
	S 4.2 Gender equality	S 4.2.1	gender Equality	√	
	S 4.3 Support to Vulnerable People	S 4.3.1	Support to Vulnerable People	√	
S5 human Safety and health	S 5.1 Workplace Safety and Health Provisions	S 5.1.1	Safety and Health Training	√	
		S 5.1.2	Safety of Workplace, operations, and Facilities	√	
		S 5.1.3	Health Coverage and Access to Medical Care	√	
	S 5.2 Public health	S 5.2.1	Public Health	√	
S6 cultural diversity	S 6.1 indigenous knowledge	S 6.1.1	Indigenous knowledge		×
	S 6.2 Food Sovereignty	S 6.2.1	Food Sovereignty	√	

Once the indicators have been selected, the data have been processed with the SAFA Tool Software (version 2.2.40) (FAO, 2014b), which allows a graphical representation of the results to be obtained and provides a complete report on performance, including issues and data quality. The final report should identify areas that need improvement and those with good levels of

DATA COLLECTION:

Data were collected between June and December 2023 through interviews and direct observation. Primary information was obtained through Semi-structured interviews: conducted in the selected

sustainability. The display of sustainability performance is represented by a radar chart in which a black line connects the various themes analyzed following a traffic light color code: very good/good practices (green), need for improvement (yellow/orange), or unacceptable (red).

Case Studies: As shown in (farms via a questionnaire distributed to 15 agribusinesses, lasting between 35–45 min aimed at answering a series of questions based on the SAFA indicators. The principal investigator interviewed each representative of the case studies that were taken into consideration. The questions

have been translated from English into Arabic, and the interviews have been transcribed in the original language. Direct observation: of farms **Table 6)** All agribusinesses in Ismailia are taken into consideration in case studies.

DATA COLLECTION:

Data were collected between June and December 2023 through interviews and direct observation. Primary information was obtained through Semi-structured interviews: conducted in the selected farms via a questionnaire distributed to 15 agribusinesses, lasting between 35–45 min aimed at answering a series of questions based on the SAFA indicators. The principal investigator

taking into account the indicators to be analyzed. Visits and direct observations were made in all the farms involved in the study.

interviewed each representative of the case studies that were taken into consideration. The questions have been translated from English into Arabic, and the interviews have been transcribed in the original language. Direct observation: of farms taking into account the indicators to be analyzed. Visits and direct observations were made in all the farms involved in the study.

Table 6: Overview of Agribusinesses in Ismailia

Analyzed Farm	Location	Extension (Feddan)
6 th of October	Al Qassasin	8047
Techno green	Abu Suwayr	70
Company for agricultural development	Abu Suwayr	52
Company for agricultural production	Abu Suwayr	80
Company for Trade and Housing	Abu Suwayr	137
Arabian Company	Abu Suwayr	130
Company for agricultural investment	Abu Suwayr	351
National Company Foodico	Ismailia	205
Arabian Company for Libyan Projects	Al Tal Al Kabir	2560
Shams Agricultural Group	Al Tal Al Kabir	790
Ibrahim Al-Desouki Al-Banna	Al Tal Al Kabir	812
Oriental Weavers Mahmoud Khamis Farid	Al Tal Al Kabir	1500
Al-Jaara Company, Muhammad Farid Jaara	Al Tal Al Kabir	60
Al-Safi Muhammad Abdel Monsef Ayad	Al Tal Al Kabir	20
Ceramica Cleopatra	Al Tal Al Kabir	80

Source: Directorate of Agriculture in Ismailia, Egypt

RESULTS AND DISCUSSION:

The results obtained by the 15 enterprises are very variable between them and include between limited and best levels of sustainability. The themes in which the 15 enterprises have achieved the same levels of sustainability are: “Participation” enterprises have achieved a moderate score as difficult identification and participation of all stakeholders. “Rule of Law”, enterprises have achieved the best score as all

companies are subject to the regulations and laws applied in Egypt. “Biodiversity”, in which the 15 companies have reached a moderate level as they cultivate large-scale monocultures; “Vulnerability”, with the best score thus being not very vulnerable, since they adopt strategies to mitigate internal and external risks; “Local Economy”, with best levels of sustainability as the companies support the local economy by employing local labor.



Fig (1): Agribusiness SAFA radar chart

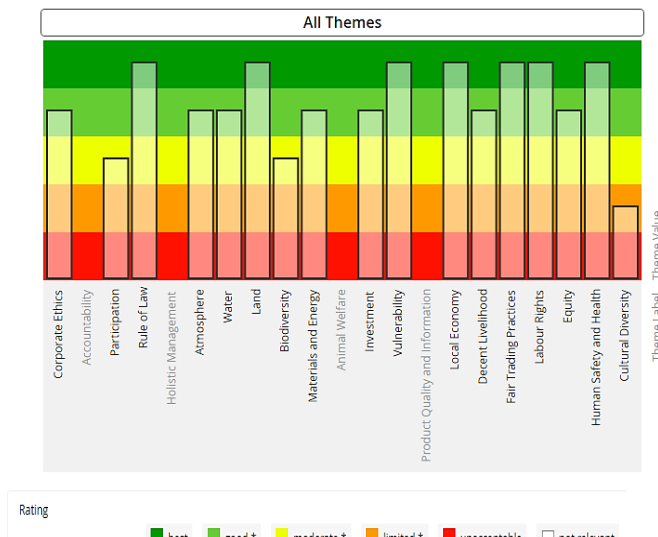


Fig (2): Agribusiness SAFA all themes

Table 7: Good Governance for Agribusiness

Themes	sub-Themes	Indicator	Mean Score	Indicator % Score	sub-Themes % Score	Themes % Score
g1 corporate ethics	g.1.1 Mission Statement	g 1.1.1	3.67	73.33%	73.33%	72.00%
		g 1.1.2	3.67	73.33%		
	g 1.2 due diligence	g 1.2.1	3.47	69.33%	69.33%	
g3 Participation	g 3.1 Stakeholder dialogue	g 3.1.1	2.93	58.67%	53.67%	54.67%
		g 3.1.2	2.53	50.67%		
		g 3.1.3	2.87	57.33%		
		g 3.1.4	2.40	48.00%		
	g 3.2 Grievance Procedures	g 3.2.1	3.00	60.00%	60.00%	
g 3.3 conflict resolution	g 3.3.1	2.67	53.33%	53.33%		
g4 rule of law	g 4.1 legitimacy	g 4.1.1	4.40	88.00%	88.00%	90.67%
	g 4.2 Remedy, restoration, and Prevention	g 4.2.1	4.67	93.33%	93.33%	
		g 4.3 Civic responsibility	g 4.3.1	4.53	90.67%	
	g 4.4 resource appropriation	g 4.4.1	4.53	90.67%	90.67%	
		g 4.4.2	4.53	90.67%	90.67%	

G1 Corporate Ethics: Most enterprises have reached a good level, as the company tends toward sustainable practices and their mission is mainly productive to obtain the greatest return at the lowest cost and maximizing production.

Mission Explicitness (G 1.1.1) the enterprise or group of producers achieving a good score are able to explain the enterprise’s mission and identify how it influences the work they do.

Mission Driven (G 1.1.2) with a good score the enterprise management can identify the influence of the mission sustainability commitments in the key decisions and processes of the enterprise.

Due Diligence (G 1.2.1) with a moderate score the enterprise has accomplished some components of appropriate risk assessment, which includes internal and external risks, as well as external impacts on others in all areas of sustainability. Also, the enterprise has experienced major losses

or caused major negative impacts as a result of unmitigated risks.

G3 Participation: enterprises have achieved a moderate score of difficult identification and participation of all stakeholders.

Stakeholder Identification (G 3.1.1) with a moderate score the enterprise has partially commitment to stakeholder engagement and participation. It can describe how it identifies stakeholders. It can list some stakeholders and identify those who are vulnerable or ordinarily unable to claim their rights.

Stakeholder Engagement (G 3.1.2) With a moderate score the enterprise has partially commitment to stakeholder engagement and participation when it has achieved satisfactory engagement with 40% of identified stakeholders, including some vulnerable stakeholders and those unable to claim their rights.

Engagement Barriers (G 3.1.3) with a moderate score the enterprise has partially committed to stakeholder engagement and participation when it is able to identify potential barriers to engagement for stakeholder's barriers can include but are not limited to knowledge/information, financial, physical, geographic, cultural, religious, linguistic/communication and status barrier. Engagement may take many forms and increasingly might embrace new technologies and social media, as well as more traditional surveys, meetings, interviews, and focus groups. has developed strategies to overcome these barriers, and has evidence of this being successfully employed in some cases.

Effective Participation (G 3.1.4) with a limited score the enterprise has not engaged stakeholders or is unable to demonstrate that its stakeholder

engagement has genuinely affected the decisions it has made.

Grievance Procedures (G 3.2.1) with a moderate score the enterprise is able to identify grievance procedures for a few affected stakeholders and these are proactively publicized. These procedures meet the standards of natural justice, and the enterprise can provide evidence that procedures are being used and reports are of satisfactory resolutions.

Conflict Resolution (G 3.3.1) with a moderate score the enterprise has few relevant stakeholder groups identified and there are no unexplained obvious omissions of significant potential conflicts. Also, the enterprise has identified examples of actual conflicts, with descriptions of how they were resolved, providing evidence of how they were based on collaborative dialogue, and were based on values of respect, mutual understanding, and equity. Some enterprises have had no conflicts of interest for the last five years.

G4 Rule of Law: Enterprises have achieved the best score as all companies are subject to the regulations and laws applied in Egypt.

Legitimacy (G 4.1.1) with a good score the enterprise can provide evidence of a governance-endorsed risk management strategy in operation to ensure legal and regulatory compliance - including any standards voluntarily entered into and international human rights standards – and all laws, regulations, and codes voluntarily entered into are included in this evidence.

Remedy, Restoration, and Prevention (G 4.2.1) with the best score the enterprise can provide evidence of the prompt remedy, restoration, or compensation, and action to prevent a further breach, and a review with any affected

stakeholder confirms the adequacy of restoration or compensation arising from any breach.

Civic Responsibility (G 4.3.1) With the best score the enterprise has clear records/register of all groups of which it is a member or supports which are involved in activities that seek to influence laws, regulations, international human rights codes, or voluntary codes.

Free, prior, and Informed Consent (G 4.4.1) with a best score the enterprise can demonstrate awareness of stakeholder’s pre-existing access to land, water, biodiversity, and natural resources, by

community asset mapping or another equivalent process.

Tenure Rights (G 4.4.2) with a best score the enterprise has a record of all transactions related to tenure and access rights and can show clearly all the principles of the Voluntary code on the Governance of tenure aremet. Where there has been any breach or alleged breach of tenure rights, the enterprise can prove that it has fully and promptly co-operated with any inquiry and remedy process to the satisfaction of affected parties.

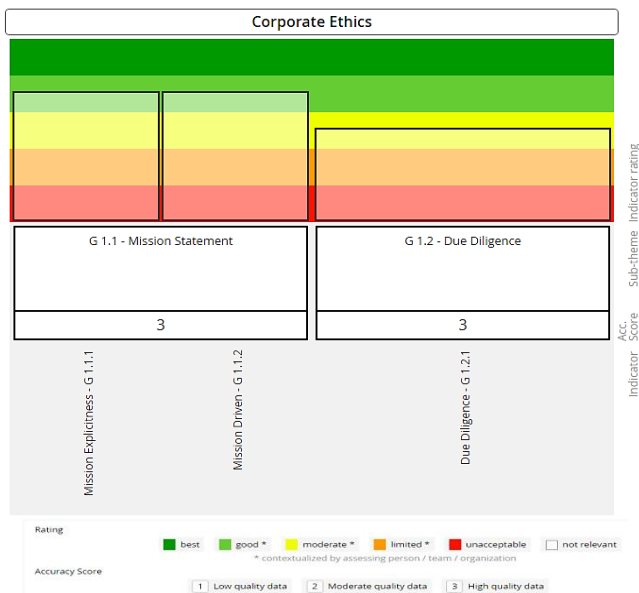


Fig (3). G1 Corporate Ethics for Agribusiness

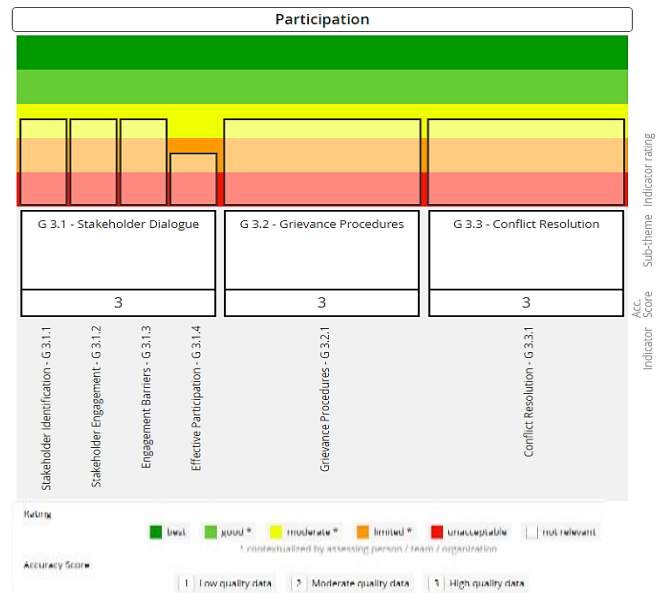


Fig (4) G3 Participation for Agribusiness

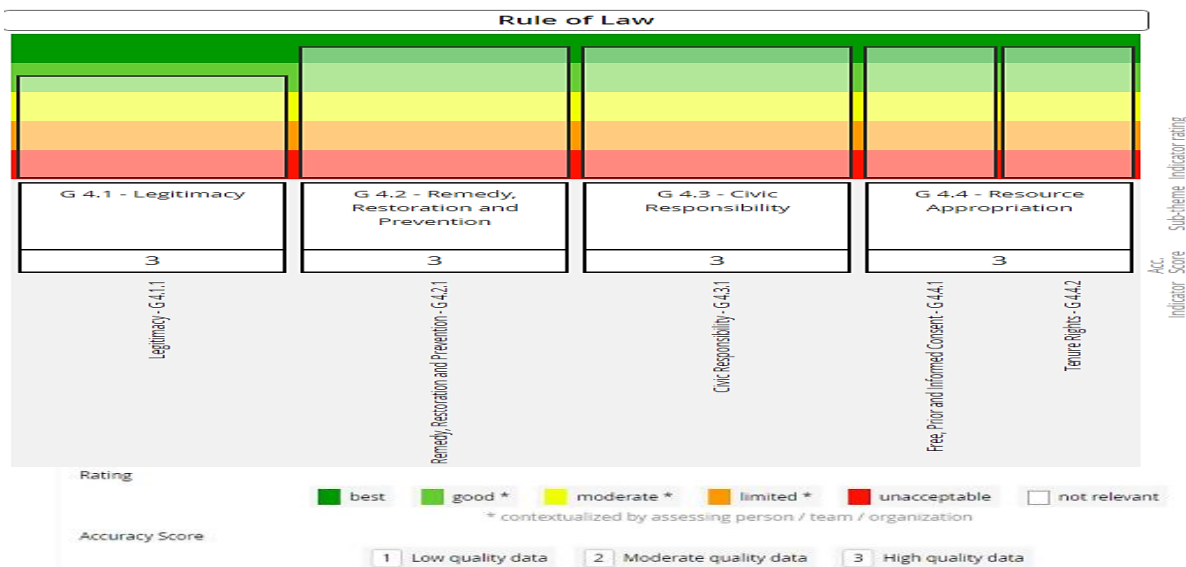


Fig (5): G4 Rule of Law for Agribusiness

ENVIRONMENTAL INTEGRITY:

Table 8: Environmental Integrity for Agribusiness

Themes	sub-Themes	Indicator	Mean Score	Indicator Weight Points	Indicator % Score	sub-Themes % Score	Themes % Score		
e1 atmosphere	e 1.1 Greenhouse gases	E 1.1.1	4.13	0.75	75.00%	75.00%	75.00%		
		E 1.1.2	4.20	1.50	75.00%				
	e 1.2 Air Quality	E 1.2.1	3.53	0.75	75.00%	75.00%			
		E 1.2.2	4.33	1.50	75.00%				
	e2 water	e 2.1 water withdrawal	E 2.1.1	3.33	0.50	50.00%		66.67%	68.75%
			E 2.1.2	3.67	1.50	75.00%			
e. 2.2 water quality		E 2.2.1	4.13	0.75	75.00%	75.00%			
		E 2.2.2	4.33	1.50	75.00%				
e3 land		e 3.1 Soil Quality	E 3.1.1	4.60	2.00	100.00%	94.64%	96.88%	
			E 3.1.2	4.53	3.00	100.00%			
	E 3.1.3		4.47	2.25	75.00%				
	E 3.1.4		4.60	3.00	100.00%				
	E 3.1.5		4.53	3.00	100.00%				
	e 3.2 Land degradation	E 3.2.1	4.53	1.00	100.00%	100.00%			
		E 3.2.2	4.53	2.00	100.00%				
		E 3.2.3	4.53	3.00	100.00%				
		e 4. 1 Ecosystem diversity	E 4.1.1	2.93	0.50		50.00%		45.83%
			E 4.1.2	1.80	0.50		25.00%		
E 4.1.3	2.73		1.50	50.00%					
E 4.1.4	2.20		0.75	25.00%					
E 4.1.5	3.87		2.25	75.00%					
e4 biodiversity	e 4.2 Species diversity	E 4.2.1	2.67	0.50	50.00%	44.44%			
		E 4.2.2	1.80	0.50	25.00%				
		E 4.2.3	2.73	1.50	50.00%				
		E 4.2.4	2.60	1.50	50.00%				

		E	1.8		25.0		
		4.3.1	0	0.50	0%		
	e. 4.3	E	1.6		25.0		
	geneti	4.3.2	0	0.75	0%		
	c	E	4.5		100.	51.7	
	divers	4.3.3	3	3.00	00%	9%	
	ity	E	1.4		0.00		
		4.3.4	0	0.00	%		
		E	4.5		100.		
		4.3.5	3	3.00	00%		
		E	3.6		75.0		
	e 5.1	5.1.1	7	1.50	0%		
	mater	E	4.3		75.0	75.0	
	ial use	5.1.2	3	2.25	0%	0%	
		E	4.4		75.0		
		5.1.4	0	2.25	0%		
		E	3.3		50.0		
	e 5.2	5.2.1	3	0.50	0%		
e5 materials and energy	energ	E	4.3		75.0	70.8	
	y use	5.2.2	3	1.50	0%	3%	75.0
		E	4.2		75.0		0%
		5.2.3	7	2.25	0%		
	e 5.3	E	4.5		100.		
	Waste	5.3.1	3	1.00	00%		
	reduc	E	4.4		75.0	79.1	
	tion	5.3.2	0	1.50	0%	7%	
	and	E	4.2		75.0		
	dispos	5.3.3	7	2.25	0%		
	al						

E1 Atmosphere: most enterprises have reached a good level, as they use machinery with consequent emissions of greenhouse gases and the use of chemicals that can interfere with the air quality.

GHG Reduction Target (E 1.1.1) with a good score the enterprise has a target and has been implementing steps towards reducing GHG emissions; however, this has not been put into writing.

GHG Mitigation Practices (E 1.1.2) With a good score the enterprise has soil fertility management with organic materials and improved fertilizer application timing. Extended crop rotations, use of cover crops, and avoidance of using bare fallows. Land-cover changes to more complex and diverse systems, such as organic agriculture, and mixed crop-livestock systems. soil and water conservation measures, such as soil or stone

bunds, drainage measures, swales, and low-energy irrigation. zero tillage and incorporation of residues. Engines are regularly serviced and suitable. Lowest-powered tractors/machinery are used. Water conservation techniques and water management in paddies. Restoration of degraded lands.

Air Pollution Reduction Target (E 1.2.1) with a good score the enterprise has targets and has implemented steps for reducing and preventing air pollution; however this has not been put into writing.

Air Pollution Prevention Practices (E 1.2.2) with a good score the enterprise has soil fertility management with optimized fertilizer application rates and timing (both within the season and the day), and most enterprises' crop residues transfer to compost. One farm burning of crop residues.

E2 Water: few enterprises obtained a moderate score because it uses chemical substances that can interfere with water quality, and most enterprises have obtained a good score since the water is taken in abundance from neighboring water bodies to irrigate the plantation. The field is irrigated every day through a drip irrigation system and a sprinkler.

Water Conservation Target (E 2.1.1) with a moderate score the enterprise has targeted and has implemented steps towards water conservation; however, this has not been put into writing.

Water Conservation Practices (E 2.1.2) With a good score the enterprise has practices such as mulching and tillage to break pore continuity and reduce water evaporation from soils. Minimization of irrigation water, such as by use of efficient irrigation technologies. Breeding and selection of crop species and varieties that are

adapted to local climate and make efficient use of water.

Clean Water Target (E 2.2.1) With a good score the enterprise has targeted and has implemented steps toward preventing water pollution; however this has not been put into writing.

Water Pollution Prevention Practices (E 2.2.2) with a good score the enterprise has practices such as conservation tillage practices; and non-use of highly hazardous chemicals, Persistent Organic Pollutants, and those having potential adverse effects on aquatic life, including copper sulfite, glyphosate, atrazine, 2,4-d, carbaryl, malathion, etc; Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials; and soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales.

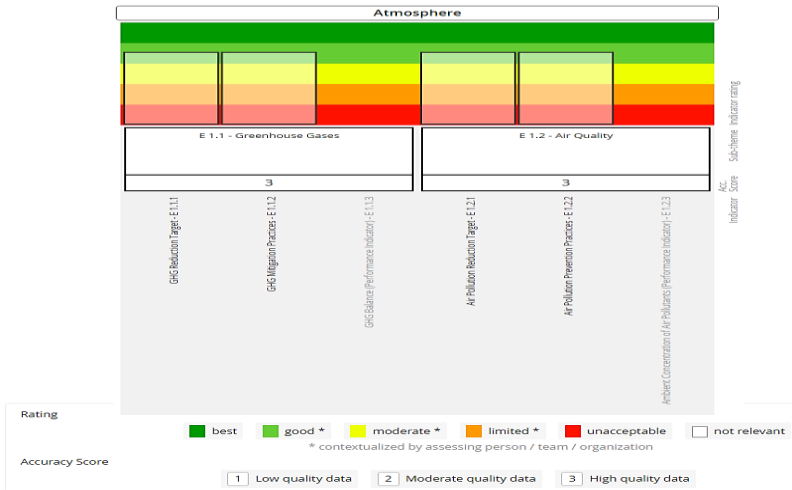


Fig (6). E1 Atmosphere for Agribusiness



Fig (7). E2 Water for Agribusiness

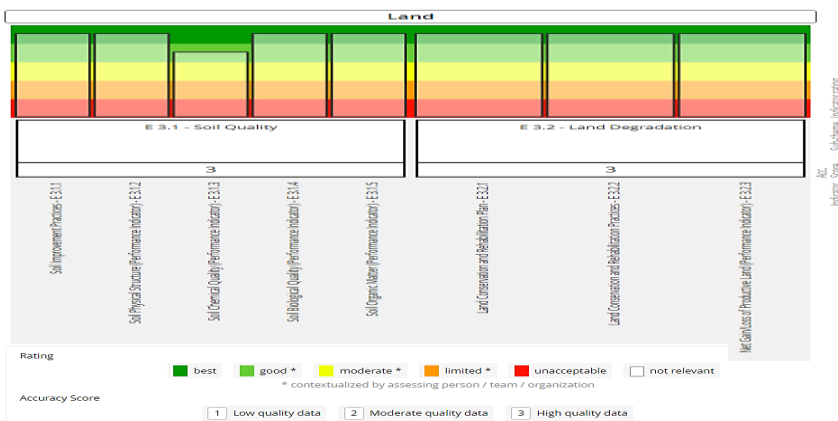


Fig (8) E3 Land for Agribusiness

E3 Land: It does not use highly contaminated chemicals use chemical fertilizers and pesticides, fumigates 10 times per cycle uses the sod-seeding technique, and seeds are treated with chemicals. Soil analysis determined the amount of fertilizer to be used. To fertilize the land poultry, ash, and compost from food residues and chemicals are used. Never leaves the land with one green manure crop even every five years.

Soil Improvement Practices (E 3.1.1) with the best score the enterprise has practices all problematic aspects for soil quality are tackled by effective measures in all areas concerned. application of organic fertilizers (manure, slurry, compost) to

enhance soil organic matter content, improve crop nutrient supply and stimulate soil life; wise application of mineral fertilizers to improve soil fertility; liming to increase soil pH if acidity is present; improving soil drainage, and chemical remediation using gypsum to reduce soil salinity and decrease soil pH; better drainage and/or sub-soiling to increase nutrient availability and water retention; implementation of a diverse crop rotation, improved fallow techniques, intercropping, to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.



Fig (9). E4 Biodiversity for Agribusiness

Soil Physical Structure (E 3.1.2) with the best score the soil physical structure is in excellent condition on all land used by the enterprise, with no signs of soil compaction or structural degradation. Through visual inspection of the soil surface and/or crop (root) growth using the spade method, in combination with quantitative measurements (e.g. with a penetrometer), delineate those areas where soil compaction or an unstable soil structure limits plant growth and/or causes waterlogging. Soil Chemical Quality (E

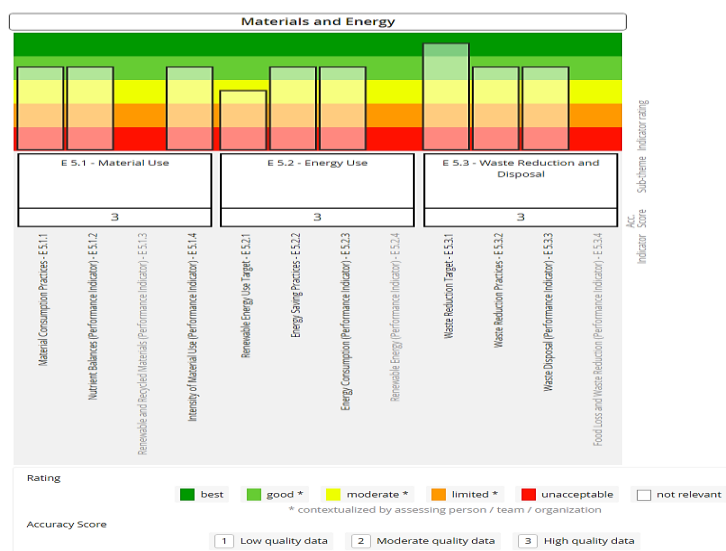


Fig (10). E5 Materials and Energy for Agribusiness

3.1.3) with a good score the soil chemical quality is in good condition on all land used by the enterprise, with no signs of chemical soil pollution. through visual inspection of plant growth in combination with soil sampling and analysis, delineate those areas where soil pH is too high (pH >8.5) or too low (pH <4.5), salinity is too high, chemical pollution (with heavy metals such as Cd, Cu, Ni, or organic compounds such as PCBs) does not exist or imbalances of nutrient supply (excess or deficiency) limit plant growth.

Using color guides to crop nutrient deficiencies. Collecting soil sampling for laboratory tests to measure soil pH, available P, Na, Mg, exchangeable Ca, Mg, and Al to estimate total acidity. Soil Biological Quality (E 3.1.4) with the best score the soil biological quality is in excellent condition on all land used by the enterprise, with no signs of biological soil degradation through soil sampling and analysis, determine the values of feasible soil biological quality parameters on the land used by the operation. Established metrics include the abundances of certain taxa (e.g. earthworms, ants, termites), the activity of micro-organisms or soil biota as a whole (e.g. soil respiration), and the presence of metabolic substances (e.g. ergosterol, enzymes such as phosphates, urease, and dehydrogenase). Soil Organic Matter (E 3.1.5) with the best score the soil organic matter content and quality are in excellent condition on all land used by the enterprise, with no signs of quantitative or qualitative losses. Through soil sampling and analysis, determine the values of feasible soil biological quality parameters on the land used by the enterprise. Established metrics include the abundances of certain taxa (e.g. earthworms, ants, termites), the activity of microorganisms or soil biota as a whole (e.g. soil respiration), and the presence of metabolic substances (e.g. ergosterol, enzymes such as phosphates, urease, and dehydrogenase). Land Conservation and Rehabilitation Plan (E 3.2.1) with the best score is the area of degraded and rehabilitated land where soil productive capacity was substantially enhanced or restored by measures that the enterprise implemented. Such measures include the phytoremediation of polluted soils, the chemical remediation of saline soils, and the

recultivation of land. Land Conservation and Rehabilitation Practices (E 3.2.2) with a best score conservation practices are in place in all sites threatened by soil degradation, and rehabilitation practices are in place in all previously degraded sites. Net Loss/Gain of Productive Land (E 3.2.3) with the best score the land balance is positive, that is more land was rehabilitated than was degraded.

E4 Biodiversity: Large-scale monocultures.

Landscape/Marine Habitat Conservation Plan (E 4.1.1) with a moderate score the enterprise has a plan and has taken steps toward its targets; however this has not been put into writing. Ecosystem Enhancing Practices (E 4.1.2) with a limited score the enterprise has practices annual monoculture cultivation; reliance on off-farm synthetic inputs for both fertilizers and pesticides and/or complete reliance on off-farm feed.

Structural Diversity of Ecosystems (E 4.1.3) with a moderate score most utilized and adjacent land habitat is covered by monocultures with a single habitat layer and no substantial horizontal heterogeneity, although the landscape would be structurally diverse without human influence. Ecosystem Connectivity (E 4.1.4) with a limited score the activities of the company have contributed substantially to reducing the connectivity and structural complexity of the landscape. Land Use and Land Cover Change (E 4.1.5) with a good score the enterprise has not caused any ecologically degrading LULCC. Species Conservation Target (E 4.2.1) with a moderate score the enterprise has a conservation target and has been implementing steps towards its implementation; however this has not been put into writing. Species Conservation Practices (E 4.2.2) with a limited score the enterprise's

activities have contributed to deteriorating conditions for wildlife conservation and rehabilitation. Diversity and Abundance of Key Species (E 4.2.3) with a moderate score the enterprise has no information about the development of populations of threatened, vulnerable, and introduced species in ecosystems managed or influenced by the enterprise's operations. Diversity of Production (E 4.2.4) With a moderate score the enterprise crops are grown in monoculture, without any crop rotation, or only in a two-year constant rotation with the same two crops, although alternative crops would be available; Highly intensive single-species farming operations and plantations. Wild Genetic Diversity Enhancing Practices (E 4.3.1) with a limited score the enterprise monoculture cultivation, stocking densities that exceed the carrying capacity of local pastures. Agro-Biodiversity In-Situ Conservation (E 4.3.2) with a limited score for all species, the main genetic lineage of crops/exotic breed, or the most common genetic lineage within exotic breeds where no locally adapted breeds exist, does not represent more than 20%.

Locally Adapted Varieties and Breeds (E 4.3.3) with the best score of at least 80% of the cultivated lands are used for locally adapted, rare, or traditional varieties. Genetic Diversity in Wild Species (E 4.3.4) with an unacceptable score the enterprises do not have even 1% of the land with non-utilized plants. Saving of Seeds and Breeds (E 4.3.5) with the best scores most of the seeds of those species and varieties where this is feasible are saved from year to year.

E5 Materials and Energy: Material recycling. In all cases, cultivation is mechanized.

Material Consumption Practices (E 5.1.1) with a good score consequent prioritization: minimize material input > minimize wastage > recycle waste. Replacement of material-intensive processes and machinery by more efficient alternatives, nutrient management: establishment of farm-level and parcel-level nitrogen and phosphorus balances, as a basis for fertilization planning, and targeted nutrient application using appropriate technologies, taking into account soil and weather conditions and crop development.

Nutrient Balance (E 5.1.2) with a good score enterprises using an established method and recognized standard values, nitrogen and phosphorus supply and demand of the operations being calculated.

Intensity of Material Use (E 5.1.4) with a good score the quantity of materials used per unit produced in the operation (excluding fuel, machinery, and food, including packaging and agrochemicals) has decreased during the past 2 years.

Renewable Energy Use Target (E 5.2.1) with a moderate score the enterprise has a plan with a set renewable energy target, but no steps have been made towards achieving the target.

Energy Saving Practices (E 5.2.2) with a good score most feasible energy-saving practices have already been implemented and thus, the company uses its full energy-saving potential. Practices and activities with the potential to save energy and enhance energy efficiency in the enterprise's operations, examples of such practices include: informing staff about ways to save energy and encouraging suggestions from staff; replacing energy-intensive processes with less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of

buildings, more energy-efficient machinery and procedures; investing into better insulation of buildings, reductions of unnecessary energy use (e.g. lighting of rooms when no one is present, overheating and overcooling), optimizing processes etc.

Energy Consumption (E 5.2.3) with a good score energy use of the enterprise has constantly and substantially decreased over the past five years per unit of produce.

Waste Reduction Target (E 5.3.1) with the best score the operation has waste reduction targets due to Egypt laws and has implemented steps for achieving these targets, however, this has not been put into writing.

Waste Reduction Practices (E 5.3.2) with a good score of practices and activities with the potential to reduce waste generation, in particular the generation of hazardous wastes, a list of such practices may be compiled from existing sources. "Waste hierarchy": recyclable materials, including crop residues. Those are composted; minimize waste generation, by eco-efficient processes; reuse - utilize by-products; recycle - reprocess waste for further use; dispose of remaining waste in a safe and clean manner.

Waste Disposal (E 5.3.3) with a good score the scope of this indicator includes. The waste (hazardous waste) storage, treatment, and disposal practices of the enterprise pose no threat to the health of humans and ecosystems.

ECONOMIC RESILIENCE:

C1 Investment: Most enterprises have reached a good level of sustainability, because they invest in sustainability in the long term, introducing sustainable practices in agriculture in its experimental fields to reduce chemical inputs. Production is supervised by technicians and

agronomists who successfully plan and manage the company. Install and maintain the irrigation system.

Internal Investment (C 1.1.1) with a good score investment practices that have been implemented in the enterprise for monitoring and improving sustainability performance, this includes actions such as improvement of employees' salaries and benefits, investment in research and development, improvement of production efficiency, the implementation of practices that preserve and regenerate natural resources.

Community Investment (C 1.2.1) With a good score there are multiple positive socio-economic and environmental impacts as a result of the enterprise's investments and activities implemented; there is not a disproportionate or over-consumption of resources (i.e. financial, energy, natural) in the investments made.

Long-Term Profitability (C 1.3.1) With a moderate score the enterprise has made investments to generate profits in the short term and has met completely its financial needs and obligations of the current year.

Business Plan (C 1.3.2) With a good score the business plan details and explains with accuracy a viable financial plan that presents the cash flow projections for a minimum 2-year period and additional information, as well as regarding the way the enterprise plans to generate revenue streams to this reference period.

Net Income (C 1.4.1) with a good score most enterprises' net income grows from one year to the other except one enterprise makes losses.

Cost Of Production (C 1.4.2) with a good score the enterprise calculates the total cost of production for all the products, goods, and services produced in the period; the enterprise

calculates the break-even point for each product, goods, or service produced in the year.

Price Determination (C 1.4.3) With a good score the full cost of a unit of enterprise production is

recovered, and the profit is generated through a mark-up, as the selling price results from the combination of actual costs and mark-up.

Table 9: Economic Resilience for Agribusiness

Themes	sub-Themes	Indicator	Mean Score	Indicator % Score	sub-Themes % Score	Themes % Score
C1 Investment	c 1.1 internal investment	c 1.1.1	3.53	70.67%	70.67%	79.62%
	c 1.2 community investment	c 1.2.1	3.53	70.67%		
	c 1.3 long ranging investment	c 1.3.1	3.40	68.00%		
		c 1.3.2	4.40	88.00%		
	c 1.4 Profitability	c 1.4.1	4.27	85.33%	86.67%	
		C 1.4.2	4.33	86.67%		
C 1.4.3		4.40	88.00%			
C2 Vulnerability	c 2.1 Stability of Production	C 2.1.1	4.40	88.00%	87.33%	84.89%
		C 2.1.2	4.33	86.67%		
	c 2.2 Stability of Supply	C 2.2.1	4.40	88.00%	85.33%	
		C 2.2.2	4.53	90.67%		
		C 2.2.3	3.87	77.33%		
	c 2.3 Stability of the market	C 2.3.1	4.27	85.33%	85.33%	
		C 2.4.1	4.27	85.33%		
	c 2.4 liquidity	C 2.4.2	4.13	82.67%	84.00%	
		C 2.5.1	4.00	80.00%		
	c 2.5 risk management	C 4.1.1	4.07	81.33%	84.00%	
C 4.1.2		4.33	86.67%			
C 4.2.1		4.33	86.67%			
C4 Local Economy	c 4.1 Value creation	C 4.1.1	4.07	81.33%	84.00%	
	c 4.2 Local Procurement	C 4.1.2	4.33	86.67%		
		C 4.2.1	4.33	86.67%	86.67%	84.89%

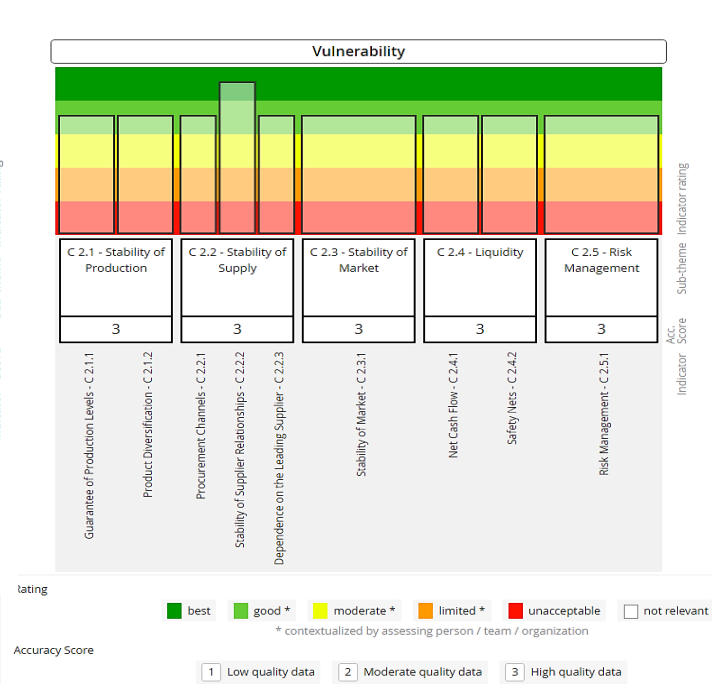
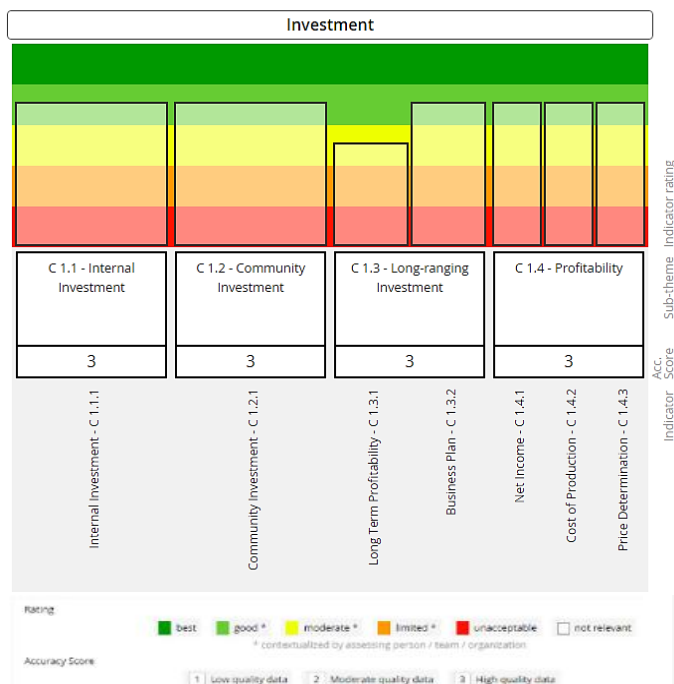


Fig (11): C1 Investment for Agribusiness

Fig (12): C2 Vulnerability for Agribusiness

C2 Vulnerability: Adoption of own strategies to mitigate internal and external risks, as they do not have insurance. Guarantee of Production Levels (C 2.1.1) with a good score the enterprises has a plan to guarantee the required volume of production and compliance with quality standards. Product Diversification (C 2.1.2) with a good score the enterprises currently produce a wide variety of products, and varieties of plants for income generation. Procurement Channels (C 2.2.1) with a good score the enterprises have diversification of suppliers, building stable and mutually beneficial business relationships with them, based on trust and competitive conditions (i.e. price and benefits), and the identification of alternative procurement channels that can be easily accessible in case of need.

Stability of Supplier Relationships (C 2.2.2) with the best score the business relationships

maintained with the suppliers benefit the enterprise (delivery of inputs, quality, and reasonable price).

Dependence on the Leading Supplier (C 2.2.3) with a good score the enterprises have benefited from the competitive advantage of having a diversified range of suppliers, as each of them could offer distinctive attributes and product differentiation (price, and quality).

Stability of Market (C 2.3.1) with a good score the enterprise has guaranteed its stability in the market through the implementation of actions and mechanisms to ensure a diversified income structure with at least three or more buyers, where no buyer is responsible for the annual income obtained from the products sold.

Net Cash Flow (C 2.4.1) with a good score the enterprise has net cash flow is above 0 (positive) in the last five years.

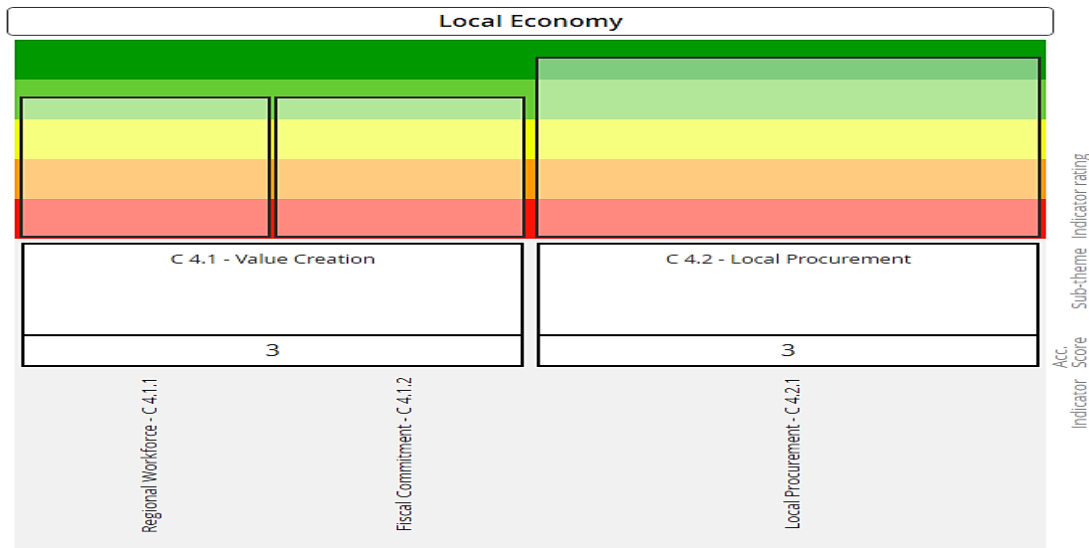


Fig (13) C4 Local Economy for Agribusiness

Safety Nets (C 2.4.2) with a good score the enterprise has access to formal (banks, micro-credit institutions, government transfers of cash) and informal (family, friends, community groups, and non-governmental institutions) financial

sources to withstand liquidity crises, which includes a sufficient number of financing sources that maintain its capital flow.

Risk Management (C 2.5.1) with a good score a set of actions and mechanisms has been

implemented to adapt to reduce the possible negative impact of all internal and external risks (price, production, market and credit risk, unstable employment relations, natural disasters, diseases and climate change) that could potentially threaten the enterprise's business.

C4 Local Economy: Production for export.

Regional workforce (C 4.1.1) with a good score in most enterprises the human resource department has hired regional employees in all the cases where similar skills, profiles, and conditions have been offered to perform adequately the required duties and responsibilities.

Fiscal Commitment (C 4.1.2) with a good score the enterprises have paid all the local taxes that are applicable. Local Procurement (C 4.2.1) with the best score, in all cases where local suppliers can provide the required inputs to the enterprise, under equal or similar conditions in comparison to non-local, the enterprise has selected local suppliers

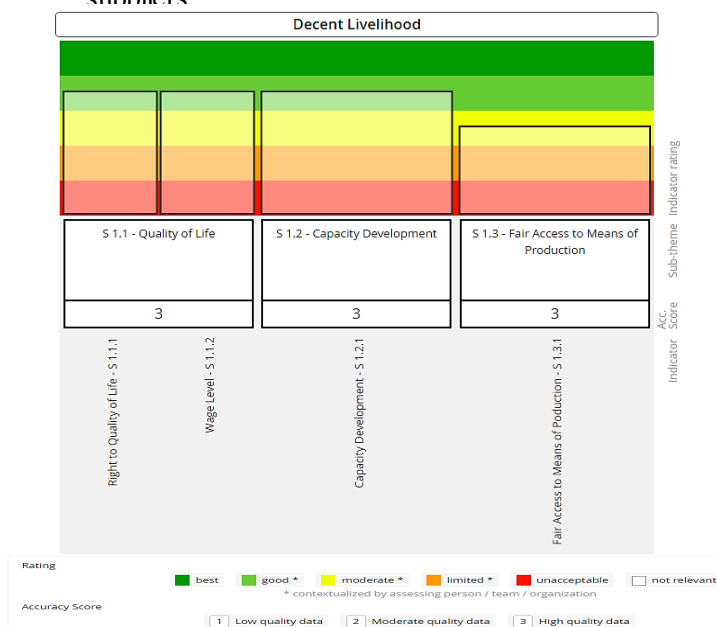


Fig (14) S1 Decent Livelihood for Agribusiness

Capacity Development (S 1.2.1) with a good score employees have opportunities for capacity development and advancement within the

SOCIAL WELL-BEING:

S1 Decent Livelihood: In a few farms, the work shifts are heavy, the workers earn minimum wage, and overtime is not adequately paid. Refresher courses are organized for their employees. In most farms, the work is not heavy. The workers' rights are respected through proper shifts.

Right to Quality of Life (S 1.1.1) with a good score all interviewed enterprises report that they live free from oppression, in peace, security, and mental and physical health, and that they are able to work healthy hours without compulsory overtime and working overtime gets double pay; are enabled to participate in the culture of their choosing, including for practice the religion; enjoy a culturally appropriate diet; with adequate time for personal and family needs.

Wage Level (S 1.1.2) with a good score of 100% of employees and personnel involved in the enterprise are paid a living wage.



Fig (15) S2 Fair Trading Practices for Agribusiness

enterprise, employees may attend training, conferences, or other learning; employees may discuss opportunities for advancement openly

with management and acquisition of necessary skills.

Fair Access to Means of Production (S 1.3.1) with a moderate score the enterprise has access to sufficient knowledge about their practices, in order to make beneficial improvements for their operation. they have access to agricultural extension services that are regular and helpful; managers regularly attend annual conferences, and trainings, that are opportunities for gaining skills.

S2 Fair Trading Practices: Most enterprises have permanent workers and temporary workers. The Rights of Suppliers (S 2.2.1) with a good score suppliers freedom to appoint a representative, or have a counselor present during their negotiations with the buyer; suppliers' freedom to meet together to discuss mutual negotiation with the buyer, including in the form of a group. S3 Labour Rights: Few enterprises hinder trade union struggles, penalizing those who seek to claim their rights. Employment Relations (S 3.1.1) with the best score employees have legally binding, written contracts on file that are updated. Contracts meet the specifications required by national or

permanent employees have a regular contract, while the daily workers do not. Few enterprises had daily workers on the plantation who were paid for piecework and did not have regular contracts.

Fair Pricing and Transparent Contracts (S 2.1.1) with a best score trade deals with suppliers are based on contracts with buyers that include the rights to negotiate the terms of trade, a conflict resolution process for resolving differences, and agreement that trade relations will not be terminated, except for just cause.

international treaties. Employees have signed the contracts. Contracts include social security provisions. Forced Labour (S 3.2.1) with a best score the use of forced labour is forbidden in Egypt's policies and in practice. The enterprise's employees are free to quit or raise grievances without fear of retaliation. Child Labour (S 3.3.1) with the best score of no employees in the enterprises under the age of 16 employed in a way that interferes with their rights due to Egypt's laws.

Table 10: Social Well-Being for Agribusiness

Themes	sub-Themes	Indicator	Mean Score	Indicator % Score	sub-Themes % Score	Themes % Score
S1 decent livelihood	S 1.1 Quality of life	S 1.1.1	3.53	70.67%	79.33%	74.33%
		S 1.1.2	4.40	88.00%		
	S 1.2 Capacity development	S 1.2.1	3.53	70.67%	70.67%	
	S 1.3 fair access to means of production	S 1.3.1	3.40	68.00%	68.00%	
S2 Fair Trading Practices	S 2.1 Responsible buyers	S 2.1.1	4.60	92.00%	92.00%	90.00%
	S 2.2 Rights of Suppliers	S 2.2.1	4.40	88.00%	88.00%	
S3 labour rights	S 3.1 Employment Relations	S 3.1.1	4.53	90.67%	90.67%	93.67%
	S 3.2 Forced Labor	S 3.2.1	4.87	97.33%	97.33%	
	S 3.3 child labour	S 3.3.1	4.53	90.67%	90.67%	
	S 3.4 Freedom of association and Right to bargaining	S 3.4.1	4.80	96.00%	96.00%	
S4 equity	S 4.1 nondiscrimination	S 4.1.1	4.07	81.33%	81.33%	75.56%
	S 4.2 Gender equality	S 4.2.1	2.80	56.00%	56.00%	
	S 4.3 Support to Vulnerable	S 4.3.1	4.47	89.33%	89.33%	

People						
S5 human Safety and health	S 5.1 Workplace Safety and Health Provisions	S 5.1.1	4.60	92.00%	89.33%	88.67%
		S 5.1.2	4.27	85.33%		
		S 5.1.3	4.53	90.67%		
	S 5.2 Public health	S 5.2.1	4.33	86.67%	86.67%	
S6 cultural diversity	S 6.2 Food Sovereignty	S 6.2.1	2.67	53.33%	53.33%	53.33%

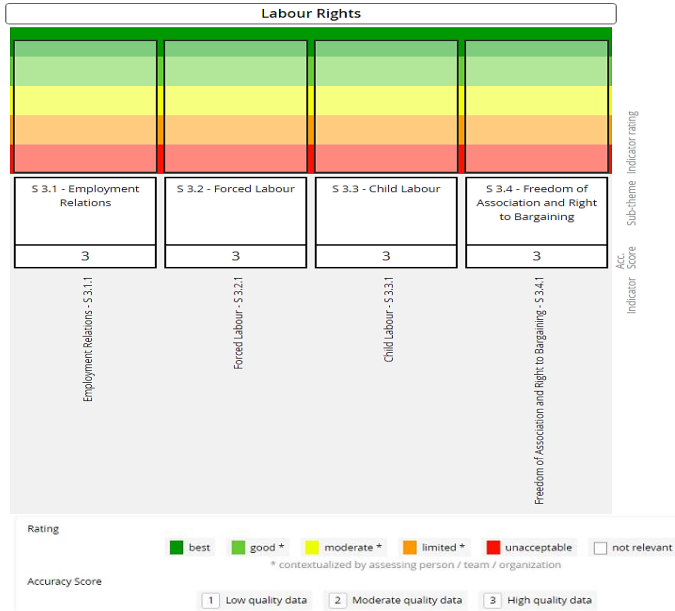


Fig (16) S3 Labour Rights for Agribusiness

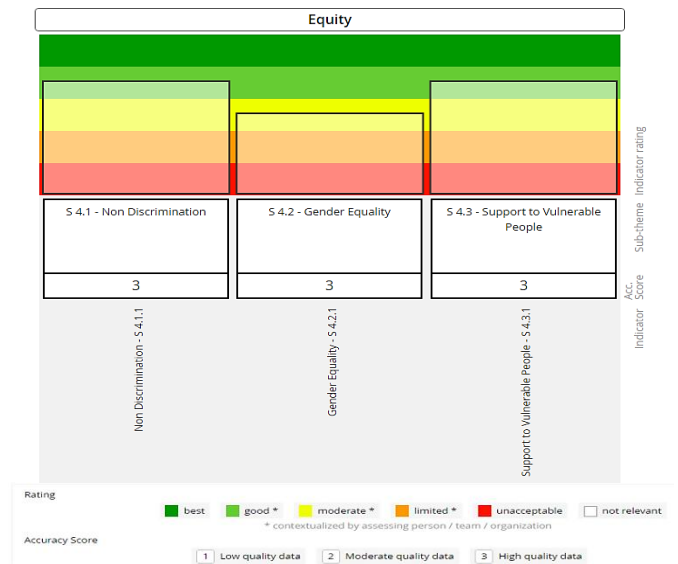


Fig (17) S4 Equity for Agribusiness

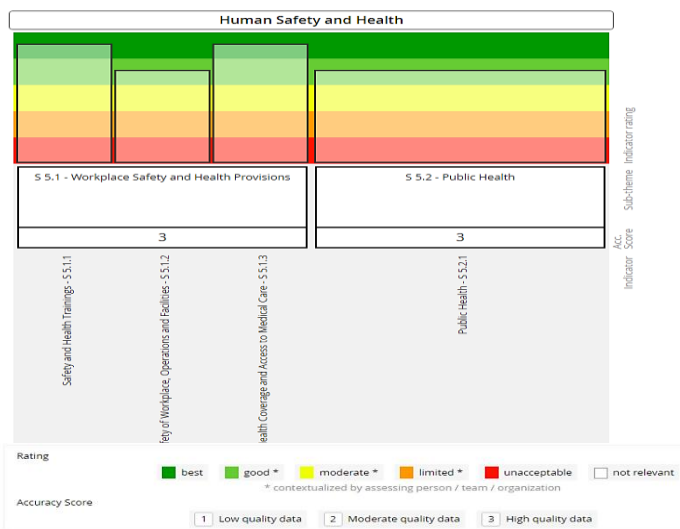


Fig (18): S5 Human Safety and Health for Agribusiness

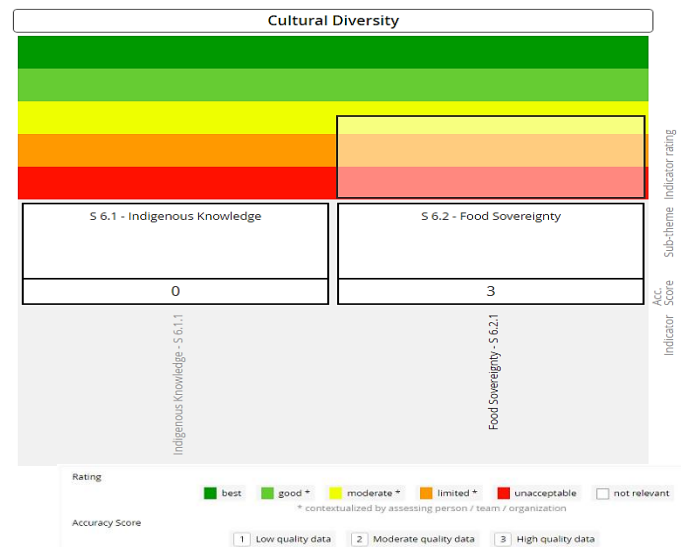


Fig (19) S6 Cultural Diversity for Agribusiness

Freedom of Association and Right to Bargaining (S 3.4.1) with the best score most enterprises the rights to freedom of association and collective bargaining are fully understood by the employees involved.

S4 Equity: Few farms employ women and disabled people according to social policies. Non-

Discrimination (S 4.1.1) with good score enterprises did not apply discrimination in any aspect of the operations including hiring, pay allocation, scheduling, workload or type, discipline, raises and bonuses, benefits against particular groups or by sexual identity. Gender Equality (S 4.2.1) with a moderate score

enterprises have provided access to medical benefits to cover prenatal, childbirth, and postnatal care for female employees; employers give preference to men in hiring, placement, training, pay, and advancement, Enterprises do not provide paid maternity leave, fire women who take time off to have a baby, or allow women to return to their position with similar wages when they return from maternity leave and do not allow women to nurse during working hours.

Support to Vulnerable People (S 4.3.1) With a good score most enterprises have applied Egypt's law of 5% disability to their workforce which accommodated varying levels of ability and disability, young workers and aged ones. Enterprises restore an injured or disabled worker to their previous position and no history of terminating injured or disabled employees exists. S5 Human Safety and Health: Social and medical insurance only exists for permanent workers, such as agronomists and machinery operators. Safety And Health Training (S 5.1.1) with the best score employees have attended at least a basic health and safety training, and those working on specialized equipment have also received appropriate training.

Safety of Workplace, Operations, and Facilities (S 5.1.2) with a good score the enterprise ensures a safe, clean, and healthy workplace for employees. Facilities structures, and equipment offered are safe and meet employee needs for healthy lifestyles. Health Coverage and Access to Medical Care (S 5.1.3) with the best score all enterprises provide health coverage and ensure emergency access to medical care for all employees. Public Health (S 5.2.1) with a good score the enterprise takes measures to avoid polluting or contaminating the local community and

contributes to the health of the local community by Egypt's laws.

S6 Cultural Diversity: Use of modern knowledge and technology.

Food Sovereignty (S 6.2.1) with a moderate score the operation sources locally adapted seed varieties or traditional, for at least a majority of their production. The operation maximizes purchases from local producers specifically using traditional varieties instead of importing or buying non-traditional varieties, for at least a majority of their raw material needs.

CONCLUSION AND RECOMMENDATIONS:

The assessment of corporate ethics and sustainability practices reveals a mixed landscape. Most enterprises have achieved a good level in addressing the atmosphere and water themes, but there are concerns about emissions of greenhouse gases and chemical use. The focus on maximizing production has hindered some enterprises from prioritizing sustainable development. Additionally, heavy work shifts raise questions about the well-being of workers. However, most enterprises have attained high levels in ensuring labor rights. Efforts are needed to improve sustainability practices and prioritize the well-being of both the environment and workers. Reducing greenhouse gas emissions as well as the use of chemicals and pesticides, reduction in the number of working hours to increase workers well-being. However, growing interest in sustainable concerns, fueled in part by the depletion of natural resources, is gradually driving the implementation of innovative sustainable practices. A new agricultural policy reform is required to improve agricultural productivity and public benefits in various types of farms, considering economic, environmental, and social

perspectives. In this regard, we feel that the SAFA technique is a valuable tool for policymakers in formulating and assessing policies. As shown in this research, SAFA may be used to compare

REFERENCES:

- Abdel Monem, M. A. S., & Radojevic, B. (2020). Agricultural Production in Egypt: Assessing Vulnerability and Enhancing Adaptive Capacity and Resilience to Climate Change. In E.-S. Ewis Omran & A. M. Negm (Eds.), *Climate Change Impacts on Agriculture and Food Security in Egypt: Land and Water Resources—Smart Farming—Livestock, Fishery, and Aquaculture* (pp. 205-222). Cham: Springer International Publishing.
- Blench, R. (2001). Pastoralism in the new millennium. *FAO animal production and health paper*, 150, 11-34.
- Cammarata, M., Timpanaro, G., & Scuderi, A. (2021). Assessing Sustainability of Organic Livestock Farming in Sicily: A Case Study Using the FAO SAFA Framework. *Agriculture*, 11(3). doi:10.3390/agriculture11030274
- Derkimba, A. A., Aubron, C., Ickowicz, A., Touré, I., & Moulin, C.-H. (2015). An innovative method to assess the sustainability of pastoral systems in their territories (PSSAF). *Revue d'Elevage et de Médecine Vétérinaire des Pays Tropicaux*, 68(2-3), 135-142.
- FAO. (2013). *SAFA Sustainability Assessment of Food and Agriculture Systems: various types of farms and highlight crucial concerns for developing successful intervention policies.* Indicators. Food and Agriculture Organization of the United Nations-Roma, Italy.
- FAO. (2014a). *SAFA Sustainability Assessment of Food and Agriculture Systems: Guidelines version 3.0: Food and Agriculture Organization of the United Nations- Roma, Italy.*
- FAO. (2014b). *SAFA Sustainability Assessment of Food and Agriculture Systems: Tool User Manual Version 2.2.40.* Food and Agriculture Organization of the United Nations- Roma, Italy.
- Kassim, Y., Mahmoud, M., Kurdi, S., & Breisinger, C. (2018). An agricultural policy review of Egypt: first steps towards a new strategy. *MENA RP Working Paper*(11).
- Pérez-Lombardini, F., Mancera, K. F., Suzán, G., Campo, J., Solorio, J., & Galindo, F. (2021). Assessing sustainability in cattle silvopastoral systems in the Mexican tropics using the SAFA framework. *Animals*, 11(1), 109.
- Soldi, A., Aparicio Meza, M. J., Guareschi, M., Donati, M., & Insfrán Ortiz, A. (2019). Sustainability Assessment of Agricultural Systems in Paraguay: A Comparative Study Using FAO's SAFA Framework. *Sustainability*, 11(13). doi:10.3390/su11133745