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Examining the Ethiopian sugar industry risks and mitigation strategies

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Abstract---This research aims to carry out a comprehensive assessment of the risks observed in the sugar industry; evaluate the extent to which proper mitigations strategies are being adopted; and, propose actionable mitigation strategies for resilient industry development. A mixed research design was applied in the course of this research. From the population of Ethiopian Sugar Industry Group, sugar factories, and key players in the sugar industry, sample participants are selected by means of both random and judgmental sampling methods. A total number of 734 participants have participated in the study, providing data through questionnaire, interview, and FGD. Primarily, data was analyzed quantitatively while a mixed analysis method is employed as the data types are both qualitative and quantitative. Based on the data analysis, logistics and transportation cost, regulatory barriers and bureaucracy, human resources development, financial unavailability, high interest rates and cost of capital, lack of private sector investment, and limited access to agricultural credit schemes are identified as key risk factors in sugar industry in Ethiopia. Thus, a proactive stance towards risk assessment and management is suggested to bolster overall growth and promote resilience within the sugar industry while ensuring that the Ethiopian sugar industry can thrive in an increasingly competitive global landscape. Further, the state actors should implement forward-thinking policies and foster partnerships across various stakeholder groups to safeguard the industry against the pitfalls that threaten its stability.

Keywords---sugar industry, mitigation strategies, risk factors.

1. Background

The Ethiopian sugar industry has a rich history and significant potential for growth. It began in 1951 with the establishment of the first modern sugar factory in Wonji and today, the industry has grown in terms of number of sugar factories, expanded the sugarcane plantation estate, number of personnel it employees, capacity of production, variety of its products, and generally the economy it runs (Ethiopian Sugar Industries Group, 2024). While the state organization named the Ethiopian Sugar Industry Group (ESIG) manages the industry at national level and oversees the projects under construction, there are also certain independent sugar factories only their marketing activities are executed by the ESIG.

The industry plays a crucial role in the nation's economy, providing employment and contributing to both local consumption and export potential. As a result, the Sugar Industry Development Projects have been one of the flagship development projects in Ethiopia (Kamski, 2016). As a result, ESIG adopted a dual-track approach: modernizing and expanding existing estates while also developing new estates and sugarcane processing facilities in various parts of the country (Abraham Demissie, 2018; 2020).

Irrespective of the endeavors, the status of the industry's development has not yet been extensively reviewed. Moreover, existing literature lacks comprehensive analyses of the risk factors in the industry in the country context and how the risks are mitigated.

2. Literature review

2.1. Overview of the Ethiopian sugar industry and its significance to the economy

The Ethiopian sugar industry plays a pivotal role in the country's economic landscape, emerging as a significant contributor to both agricultural productivity and national revenue. With abundant arable land and favorable climatic conditions, Ethiopia possesses the potential to substantially increase its sugar production, thus enhancing food security and generating employment opportunities in rural areas. The government's strategic initiatives aim to expand the sector, focusing on sustainable practices that align with comprehensive development goals. By integrating sustainability goals into current development strategies, Ethiopia can work towards optimizing land use while mitigating environmental impacts (Amanda, et. al., 2012; German, et al., 2020). Furthermore, effective management of the industry's vulnerabilities to natural disasters, exacerbated by climate change, is crucial for long-term stability and growth (Southard et al., 2017). Through these concerted efforts, the Ethiopian sugar industry could transform into a cornerstone of economic resilience, driving both local and national development.

2.2 Risks Associated with the Growth and Development of the Sugar Industry

The expansion of the sugar industry in Ethiopia, while offering potential economic benefits, also presents significant risks that could undermine environmental sustainability and local livelihoods. Large-scale irrigation pose a considerable threat to hydrological systems and biodiversity, resulting in dire socio-economic consequences for indigenous communities dependent on these ecosystems (Kamski, 2016). Such transformations can echo the devastating impacts observed in Central Asia's Aral Sea, suggesting a potential crisis in Ethiopia that requires urgent attention. Furthermore, the imperative to balance economic growth with sustainable practices emphasizes the necessity for integrating sustainability goals into development strategies (Lavigne, et al., 2012). Thus, without appropriately addressing these associated risks, the ambitious growth of the sugar industry could lead to destabilization, exacerbating existing vulnerabilities within both the environment and affected populations.

2.3. Mitigation Strategies for Identified Risks and Challenges

Effective mitigation strategies for identified risks and challenges are essential for ensuring sustainable sugar industry growth. One primary approach involves integrating sustainability goals into the national development strategies, which can significantly reduce the adverse impacts of climate change and promote the resilience of agricultural systems (Rani, 2019). By adopting innovative policies and financing programs, the interlinked issues of food insecurity and unsustainable agricultural practices can also be addressed. As highlighted in Negra et al., (2014), various countries, are leveraging integrated policy approaches to test sustainability strategies, thereby enhancing their agricultural productivity while minimizing environmental degradation. Furthermore, capacity building within local communities and the establishment of robust institutional frameworks are critical components of these mitigation efforts (Sheetal & Kumar, 2019). Ultimately, the successful implementation of these strategies will not only bolster the sugar industry's growth but also contribute to broader national development goals, as emphasized in Lavigne, et al., (2012).

3. Research objective

The general objective of this research is to assess the risks associated with sugar industry in Ethiopia and mitigation strategies adopted. Specifically, the research aims to (1) carry out a comprehensive assessment of the risks observed in the sugar industry; (2) evaluate the extent to which proper mitigation strategies are being adopted; and, (3) propose actionable mitigation strategies for resilient industry development.

4. Methods

A mixed research design of both qualitative and quantitative methods was applied in the course of this research. From the population of ESIG, sugar factories, and key players in the sugar industry, sample participants are selected by means of both random and judgmental sampling methods. A total number of 734

participants have participated in filling in the survey questionnaire; 29 have provided data through interview, and 24 have taken part in the FGD. Structured survey questionnaire, key informant interview, and focus group discussions are used to collect data. Primarily, data was analyzed quantitatively while a mixed analysis method is employed as the data types are both qualitative and quantitative.

5. Result

5.1. Assessment of the Ethiopian sugar industry's development risks and risk factors

This section of the article is dedicated to identifying and evaluating the primary risks present in the Ethiopian sugar industry, and also involved an examination of the industry's current risk mitigation strategies.

Table 1. Business operations risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the business operations risk in the Ethiopian sugar industry?	1		2		3		4		5	
		f	%	f	%	f	%	f	%	f	%
1	Lack of robust demand forecasting system is a potential risk in the Ethiopian sugar industry	199	30.7	218	33.6	144	22.2	30	4.6	58	8.9
2	The Ethiopian sugar industry is under risk of failure to manage the production	87	13.4	150	23.1	213	32.8	101	15.6	98	15.1

liquidity risks in the Ethiopian sugar industry?											
1	The industry is capable to maintain sufficient cash flow to meet its obligations	88	13.5	100	15.4	256	39.4	104	16.0	101	15.6
2	There is an access to adequate loan facilities in the industry	256	39.4	102	15.7	166	25.6	104	16.0	21	3.2
3	Effectiveness of the industry's credit risk management policies	123	18.9	144	22.2	189	29.1	103	14.8	90	13.9
	(Low) level of bad debts in the industry	210	32.3	289	44.5	53	8.2	60	9.2	37	5.7

(1= strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= strongly agree)

Table 10 depicts responses about the industry's liquidity risks. For the item about the industry's capable to maintain sufficient cash flow to meet its obligations, 188(27.1%) agreed, 256(39.4%) neutral, and 205(29.5) disagreed. For the item about access to adequate loan facilities, 358(51.6%) agreed, 166(25.6) neutral, and 125(18.0%) disagreed.

The responses on Table 4.4 above also indicated that the Ethiopian sugar industry is exposed to the risk of ineffective credit risk management policies 267(38.5%). While 189 (29.1%) responses were neutral, 193(27.8%) disagreed. Regarding the risk of bad debts, 499(71.9%) agreed the industry is exposed to bad debt risk. In the meantime, 53(8.2%) responses were neutral, and 97(14.0%) participants disagreed.

Responses varied across the industry as seen in the interview and discussions. In the group's HQ, which is the government financed sector, shortage of cash flow is reported not to be an issue; however, most participants from the independent factories implied shortage of cash flow for the operation often took place in common (FGD 4, 6, and 10). Similarly, the high level management representatives during the interview admitted "the factories sometimes face severe cash shortage even for the administrative functions particularly during the later (third and fourth QYs) fiscal year" besides fulfilling obligations such as repaying its loan

share (FGD I; FGD II). As a cause, “inability to generate the planned profit as per the strategy in each independent factory” (FGD I) primarily determine this.

Regarding credit and bad loan risks, the interviewees from the industry’s high level management pointed out “... there is no proper policy and implementation monitoring strategy; it has so far been attempted to achieve the strategic goals by injecting as much as possible financial resources, which in turn left the industry in general in loan risk” (KI 11).

Table 3. Responses about the risk of logistics in sugar industry in Ethiopia (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1		2		3		4		5	
		f	%	f	%	f	%	f	%	f	%
3.1	Logistics Risks										
	The industry has the risk of reliable transportation network	99	15.2	49	7.5	268	41.3	180	27.7	53	8.2
	The industry has capacity to effectively control the logistics costs	101	15.6	103	15.9	192	29.6	155	23.9	98	15.1

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

According to the responses on Table 3 above, 148 (21.3%) participants agreed the industry has a reliable transportation system. While 268(41.3%) responses were neutral, 233(33.6%) disagreed. In the meantime, logistics cost is reported as a high potential risk for the industry (204 or 29.4%) while 253(36.4%) rated this as a low risk issue for the industry’s strategy implementation.

During the interview as well, the risk of factors relating to transportation was reported to be an issue in the industry for a long time. One of an industry’s development constraints, particularly in the manufacturing industry like sugar, is transportation. Taking into account most of the sugar industry’s manufacturing centers (mills) are located far away from the capital, and also from the potential ports for future exportation (note that Ethiopia is landlocked, use ports in rental in limited directions), and current operational factories are located in some parts of the country, logistics is a critical factor which can affect the industry’s development.

Table 4. Responses about market risks in sugar industry in Ethiopia (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the market risks in the Ethiopian sugar industry?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	Understanding of customer preferences and needs is put in place in the strategy	11	1.7	50	7.7	192	29.6	210	32.3	186	28.6
2	There is an effort to effectively respond to changes in customer behavior	9	1.4	70	10.8	180	27.7	200	30.8	190	29.3
3	Implementation strategies of assessing market trends is proposed and executed in the industry	133	20.5	243	37.4	96	14.8	80	12.3	97	14.9
4	There are strategies to mitigate price fluctuation	16	2.5	80	12.3	93	14.3	259	39.9	201	31.0

(1= strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= strongly agree)

As presented on Table 4 above, 61(8.8%) disagreed to the item about the risk of understanding customer preferences and needs put in place. To the same item, 192(29.6%) responses were neutral, but 396(57.1%) agreed. 79(11.4%) respondents disagreed that there is a risk of being aware of the customers' behavior in sugar industry, 180(27.7%) were neutral and 390 (56.2%) participants agreed.

Regarding the risk of implementation strategies put in place to assess the market trends, 376(54.2%) disagreed while only 96(14.8%) were neutral and a quarter (25.5%) agreed. An item about the strategies to mitigate price fluctuation yielded such responses as 96(13.8%) disagreed, 93(14.3%) neutral, and 460(66.3%) agreed.

Similarly, the interviews and FGD indicated there are potential market related risks including the issues such as increase in demand while the price fluctuation (compared to other agricultural products) and interruption in the supply of raw materials due to the industry's vulnerability to natural risks.

Table 5. Responses about human resource risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the HR related risks in sugar industry in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	An effective talent management strategy is in place in the industry	51	7.3	146	21.0	310	44.7	96	13.8	91	13.1
2	The employee engagement program is effective	101	14.5	366	52.7	200	28.8	19	2.7	8	1.1
3	There is a high risk of employee turnover	38	5.5	88	12.7	142	20.5	298	42.9	128	18.4
4	Effectiveness of employee retention strategies	60	8.6	90	13.0	150	21.6	300	43.2	94	13.5
5	There is a vibrant industry relations climate	100	14.1	216	31.1	303	43.7	12	1.7	63	9.1

(1= strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= strongly agree)

Table 5 indicates that 197(28.4%) of the participants disagreed to the item about the risk of a talent management strategy in the industry. While 310 (44.7%) participants were neutral, 187(26.9%) agreed. Regarding the risk of effectiveness of the employee engagement program, 467(67.3%) disagreed; 200(28.8%) neutral and 27(3.9%) agreed. In the meantime, 126(18.2%) of the participants disagreed about the risk of high risk of employee turnover, 142(20.5%) were neutral and 426(61.4%) agreed. Responses about the risk relating to employee retention, 150(21.6%) disagreed, 142(20.5%) neutral, and 394(56.8%) agreed. The final variable in this category was the risk relating to industrial relation, and thus the survey yielded 316 (45.5%) disagree, 303(43.7%) agree, and 75(10.8%) agree.

The survey responses above go in line with the key industry players' interview results as well. Data from both sources indicated employees' engagement is limited, as revealed in responses about strategy awareness and communication, and thus there is such a risk in Ethiopian sugar industry. Few interviewees shared statements like, "the fact that the industry is a high employer and manages large number of employees makes it difficult to involve all employees in the industry's activities, but it would enhance the production and productivity if considered" (KI 5, 6 and 9). During both discussions too, participants commented on the industry indicating industry relation is missing and it is potentially affecting the industry.

Table 6. Responses about natural/ disaster risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the natural risks in sugar industry in Ethiopia?	1 f	%	2 f	%	3 F	%	4 f	%	5 f	%
1	The industry has emergency response plans in place	102	15.7	289	44.5	211	32.5	28	4.3	19	2.9
2	The industry has post-crisis business continuity plan in place	361	55.6	139	21.4	66	10.2	33	5.1	50	7.7
3	The industry has a disaster recovery plan in place	288	50.0	253	36.4	134	19.3	13	1.9	6	0.9
4	The industry is adequately insured against natural disaster	61	8.8	89	12.8	155	22.3	188	27.1	201	29.0

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

Table 6 presents responses of the survey participants about the risk of disaster in the Ethiopian sugar industry. Thus, to the risk of emergency response plans, 391 (56.3%) disagreed, 211(32.5%) neutral, and 47(6.8%) agreed. Second, the participants provided 500(72.0%) disagree, 66(10.2%) neutral, and 83(12.0%) agree for the risk of post-crisis business continuity plan. For the item about a disaster recovery plan, 541(77.9%) disagreed, 134(19.3%) neutral, and 19(2.7%) agree. In terms of the industry's insurance against natural disaster, 150(21.6%) disagreed.

Table 7. Responses about technology risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the technology and system risks in sugar industry in Ethiopia?	1		2		3		4		5	
		f	%	f	%	f	%	f	%	f	%
1	Technology/System risks										
	The industry's information technology infrastructure is resilient to cyber attacks	180	25.9	219	31.6	308	44.4	13	1.9	0	0.0
	The industry has effective data management and protection policies	160	23.0	293	42.2	87	12.5	99	14.3	5	7.9
	The industry has effective data backup and recovery procedures	216	23.0	203	29.2	33	4.7	152	21.9	9	13.0

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

Table 7 presents responses about risks relating to technology and system risks. As shown on the table, 399(57.5%) disagreed, 308(44.4%) neutral, and 13(1.9%) agreed about the exposure of sugar industry to cyber-attacks. Regarding data management and protection policies, 453(65.3%) disagreed, 87(12.5%) neutral, and 154(22.2%) agreed. To the final variable in this category, i.e. the risk of data backup and recovery procedures, 419(60.4%) disagreed, 33(4.7%) neutral, and 242(34.9%) agreed.

The survey data with regards to the risk of system and technology revealed the industry in general and the sugar factories in particular have vibrant technology system that can mitigate if insurgency could happen. The interview also showed the industry has so far invested in digitalizing the services and production processes as well as the data system so that it can be possible to protect the whole system data properly.

Table 8. Responses about legal risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the legal risks in the sugar industry in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	Legal risks										
	The industry has legal compliance practices	199	28.7	281	40.5	46	6.6	88	12.7	80	11.5
	The industry has adequate insurance coverage for legal liabilities	106	15.3	101	14.5	21	3.0	253	36.4	213	30.7

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

As shown above on Table 8, 480 (69.2%) disagree, 46(6.6%) neutral and 168 (24.2%) responses were generated about the risk of legal compliance practices in the sugar industry. For the risk of insurance coverage for legal liabilities in the industry, 207(29.8%) disagreed, 21(3.0%) neutral, and 253 (36.4%) agreed.

Thus the responses showed, there is a risk insurance coverage for legal liabilities in Ethiopian sugar industry. Similarly, the high level management participants from the HQ and selected sugar factories also confirmed to this response: “the factories are insured of disaster, both natural and man-made, but little is known (in our country) about insuring for legal liabilities (KI 3).

Table 9. Responses about financial risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the financial risks in sugar industry in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	The industry has effective financial planning and budgeting processes	260	37.5	211	30.4	42	6.0	101	14.5	80	11.5
2	The industry has a diversified revenue stream	193	27.8	267	38.5	231	33.3	2	0.3	1	0.1

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

Manufacturing industries are highly vulnerable for financial risks. Thus, the survey took this factor into account to assess if this is true in the Ethiopian sugar industry as well. As depicted on Table 9 above, 471(67.9%) disagreed, 42(6.0%) neutral, and 181(26.1%) agreed about effectiveness of the financial planning and budgeting processes in the Ethiopian sugar industry. In the meantime, responses about diversification of the industry's revenue streams, 460(66.3%) disagreed, 231(33.3%) neutral, and 3(0.4%) agreed.

The responses about the risk of financial planning, budgeting and diversification of revenue sources were similar to the survey results. As learnt from the interview, planning and budgeting are core part of strategy for growth and development of an industry. In sugar industry, however, budget has often posed challenges. Similarly, other respondents showed "revenue streams are limited mainly to sugar though bogus and molasses are produced to some extent... (KI 2, 4, 6).

Table 10. Responses about reputation risks in sugar industry (N=694)

S. No.	To what extent do you agree or disagree with the following statements with regards to the reputation risks in sugar industry in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	The industry has a strong brand reputation	40	5.8	66	9.5	129	18.6	256	36.9	203	29.2

2	The industry has effective crisis management procedures	188	27.1	238	34.3	135	19.4	73	10.5	60	8.6
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(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

Table 10 above presents responses of survey participants about the risk of reputation in sugar industry in Ethiopia. In terms of the industry's brand reputation, 106(15.3%) disagreed, 129(18.6%) were neutral, and 459(66.1%) agreed. For the item about the risk of crisis management procedures, 133(19.2%) disagreed, 135(19.4%) neutral, and 526(75.8%) agreed.

Reputation management is part and parcel of an industry's management, especially for those engaged in manufacturing as part of its marketing management endeavors (Men, 2014). The survey data in this regard pointed out most participants agreed the industry did not have the risk of reputation (66.1%); however, the fact that as many as 459(66.1%) disagreed the industry has effective crisis management procedures showed preparation is required for any kind of risk that could result in crisis in the industry. Moreover, since the product is not yet being exported but the industry has planned to gain foreign risk through export of the industry's products, timely preparation is needed ahead of time to avoid gaining bad images. Agreed to this, participants of the interview as well as group discussion pointed out "building good image takes long time, but an industry's image can be broken in one instance, so crisis management procedures should be in place." (KI 9,13, and 3). Another participant added, "... the privatization attempt in the industry failed to some extent due to the bad image the sector has due to low performance, loan burden and environment issues....So, reputation needs to be built and maintained in a planned way." (KI 1).

Interviews and discussions with key management personnel and other stakeholders also revealed other key risk factors that need attention. The most frequently mentioned issues were changes of the amount of planting land area, risks from non-performing loans and investment loan repayment, and agrochemical and ripener risks.

During the discussion, risk Factors from raw material sourcing, which was majorly done by the state, and to some extent by the local farmers, was emphasized. In this regard, uneven production due to rainfall shortage, sugarcane diseases, and varieties of sugarcane has resulted affected productivity of sugarcane mills in some areas (FGDs). Lack sufficient sugarcane for crushing is often observed during dry season, and, in some regions, the sugarcane plants grow mature before the factories' construction was finalized. Therefore, "failure in operations management and production planning" are "prominent challenges in the industry in the past consecutive years" (KI 5).

Another interviewee brought to attention the management environment risk as "high intervention from external bodies" (KP 11). Besides the management board, according to the interviewee, the federal government bodies or even the local administration at lower tiers may come up with challenging ideas that affect the industry's development plan. Hence, execution of the plan may delay, or

discontinue in some cases until the issue is settled. Mentioned as a practical example, changes in land policy and ownership issues has in some cases were “taken to courts” (KI 10), or opposition faced” (KI 6, 7). Thus, it became hardly possible to secure land as planned to farm.

As part of the monetary policy change, the foreign exchange risk and fluctuating exchange rate in the market was mentioned as a risk (FGD). The fluctuation in rate, along with shortage of the currency, often used to affect implementation of the industry’s strategic plan.

5.2. Risk mitigation measures adopted in sugar industry in Ethiopia

Table 11. Survey responses about the risk mitigation strategies (a)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 F	%	2 f	%	3 f	%	4 f	%	5 f	%
1	The industry functions under a well-defined organization structure	43	6.2	81	11.7	143	20.6	216	31.1	211	30.4
2	Flow of information is well defined to avoid any conflict or communication gap between two or more factories	61	8.8	74	10.7	200	28.8	258	37.2	101	14.5
3	Second level positions are created in each Department to continue the work without any interruption in case of non-availability of	20	2.9	33	4.7	105	15.1	427	61.5	109	15.7

	functional heads.										
4	Proper policies are followed in relation to maintenance of inventories of raw materials, consumables, key spares and tools to ensure their availability for planned production programs.	103	14.8	196	28.2	142	20.5	70	10.1	183	26.4
5	Effective steps are being taken to reduce cost of production on a continuing basis taking various changing scenarios in the market.	83	12.0	122	17.6	191	27.5	98	14.1	200	28.8

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

As illustrated on Table 11 above, an extensive assessment was carried out to evaluate the risk mitigation measures that have been adopted to manage the business operation risks associated with the Ethiopian Sugar industry. One of the key questions posed revolved around the organizational structure within the industry. The results indicated that while 17.9% of the respondents expressed disagreement with the statement that the industry operates under a well-defined organizational structure, a significant majority, comprising 61.4%, agreed with this claim. The remaining 20.6% of respondents maintained a neutral position, suggesting varying degrees of certainty about the organizational framework in place.

In another aspect of the assessment, respondents were asked to indicate their level of agreement regarding the clarity and efficiency of information flow aimed at preventing conflicts or communication gaps between two or more factories within the industry. The responses revealed that 19.5% of respondents disagreed with the notion that the flow of information is adequately defined, while a larger group, consisting of 46.7%, articulated their agreement. Additionally, 28.8% of respondents chose to remain neutral on this issue, hinting at differing perceptions of communication practices across the organization.

The evaluation also delved into the organizational structure by examining the establishment of second-level positions in each department, intended to ensure continuity of operations in the absence of functional heads. In this instance, the survey found that 7.6% of respondents agreed with the effectiveness of this strategy, 15.1% remained neutral, and an overwhelming 77.2% expressed agreement, underscoring the collective belief in the importance of support structures for operational resilience.

Furthermore, the assessment probed into adherence to proper policies regarding the maintenance of inventories of raw materials, consumables, key spares, and tools essential for planned production programs. The results showed that a significant portion of respondents, 43%, disagreed with the adequacy of these policies. Meanwhile, 20.5% held a neutral stance, and 36.5% expressed agreement, indicating a divided opinion on the effectiveness of inventory management practices.

Additionally, respondents were invited to share their thoughts on whether effective steps are being taken to continually reduce the cost of production in light of various dynamic market scenarios. The findings revealed that 29.6% of the respondents disagreed with the effectiveness of the measures currently in place, while 27.5% remained neutral, and a notable 42.9% agreed that the industry is indeed taking proactive steps to control production costs.

The assessment also sought to gather valuable insights about the adequacy of training programs that have been implemented for staff across the Ethiopian Sugar industry. It became evident that approximately 32.4% of respondents disagreed with the assertion that the existing training programs are sufficiently comprehensive in equipping employees with the necessary skills and knowledge for their roles. Conversely, 30.3% of respondents expressed agreement, and 37.3% opted for a neutral position, highlighting a substantial divide in opinion regarding the effectiveness of training initiatives aimed at employee development.

Moreover, the evaluation included an analysis of risk management strategies formulated to address unforeseen disruptions in the production process. According to the assessment results, 25.7% of respondents expressed disagreement with the efficacy of these risk management strategies, while 34.8% agreed that these strategies are indeed effective in mitigating risks. A significant 39.5% of respondents chose to remain neutral, which suggests a complex interplay of perceptions and an acknowledgment of potential gaps in preparedness for unforeseen challenges.

The assessment further aimed to collect insights regarding the clarity of roles and responsibilities within teams. The findings indicated that 22.1% of respondents disagreed with the assertion that roles are clearly defined within their respective teams. In contrast, a majority of 55.3% expressed agreement, indicating a generally favorable perception of organizational clarity. However, the remaining 22.6% of respondents remained neutral, which points to a noteworthy portion of the workforce who perceives ambiguity regarding their roles and contributions.

Finally, the assessment touched upon the critical issue of stakeholder engagement in organizational decision-making processes. Stakeholders within the Ethiopian Sugar industry articulated varied opinions: 31.8% disagreed with the notion that their perspectives are adequately considered in decision-making, whereas 38.4% agreed that their voices are indeed heard. Additionally, 29.8% of respondents chose a neutral position on this matter. This indicates room for improvement in enhancing the integration of stakeholder feedback into the decision-making framework, which could ultimately foster greater collaboration and commitment within the industry.

In summary, while the assessment uncovering insights regarding the Ethiopian Sugar industry highlighted several positive perceptions related to the organizational structure, information flow, and management practices, it also identified critical areas that need further attention. This includes enhancing the adequacy of training programs, improving risk management measures, clarifying roles and responsibilities, and increasing stakeholder engagement. Addressing these areas is essential to enhancing the overall operational resilience and effectiveness of the industry moving forward.

Table 11. Survey responses about the risk mitigation strategies (b)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 F	%	2 f	%	3 f	%	4 f	%	5 f	%
1	Proper financial planning is put in place with detailed Annual Business Plans discussed at appropriate levels within the organization.	68	9.8	103	14.8	143	20.6	197	28.4	183	26.4
2	Annual and quarterly budgets are prepared and	80	11.5	86	12.4	183	26.4	199	28.7	146	21.0

	put up to management for detailed discussion and an analysis of the nature and quality of the assumptions, parameters etc.										
3	These budgets with Variance Analysis are prepared to have better financial planning and study of factors giving rise to variances.	100	14.4	126	18.2	206	29.7	140	20.2	122	17.6
4	Daily and monthly cash flows are prepared, followed and monitored at senior levels to prevent undue loss of interest and utilize cash in an effective manner.	99	14.3	93	13.4	210	30.3	203	29.2	89	12.8

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

The researcher conducted a thorough evaluation of various risk mitigation measures specifically targeting liquidity risks. In this analysis, participants noted the presence of solid financial planning, underscored by the implementation of annual business plans; among the respondents, a notable 54.8% expressed agreement with the effectiveness of these plans, while a slightly smaller group, comprising 24.6%, voiced disagreement regarding their sufficiency. When it came to discussions about budgeting practices, the data revealed that 49.7% of participants were in agreement; indicating a positive perception, while 23.9% did not share this viewpoint and disagreed.

In the context of variance analysis as a tool for improved financial planning, it was found that 37.8% of participants acknowledged the value of this approach. The assessment also covered daily and monthly cash flow monitoring, where 42% of respondents agreed on its importance for maintaining liquidity, contrasting with 27.7% who disagreed and believed it might not be as vital. Furthermore, in evaluating the adequacy of contingency plans designed to address liquidity challenges, the responses indicated that 25.5% disagreed with the notion that these plans were sufficient, while a larger portion, 45.4%, affirmed that having effective contingency strategies is indeed essential. Regarding cash flow forecasts, 43.9% of participants asserted their necessity for ensuring ongoing financial stability, highlighting a consensus on their importance.

In addition to these findings, participants engaged in discussions surrounding the frequency of conducting stress tests for various liquidity scenarios. Here, 37.7% of those surveyed agreed on the importance of regular stress testing, underscoring the fact that there is substantial room for improvement in current stress testing practices. Communication regarding liquidity risk strategies was also assessed; the results demonstrated that 44.7% of participants recognized its significance, while 26.8% disagreed, suggesting that there may be a need for better communication practices within organizations concerning these strategies. Lastly, in terms of staff training related to liquidity risk management, 45.4% of respondents expressed support for the implementation of regular training sessions. This sentiment underscores a notable opportunity for organizations seeking to enhance their employee education and preparedness in managing liquidity risks effectively, thus improving overall risk management capabilities.

Table 11. Survey responses about the risk mitigation strategies (c)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 F	%
1	Systems put in place for assessment of credit worthiness of dealers/customers.	20 3	29. 2	28 9	41. 6	71	10.	2 2	3. 3	10 8	15. 6
2	Provision for bad and doubtful debts made to arrive at correct financial position of the Company.	19 9	28. 7	27 3	39. 3	10 3	14. 8	3 2	4. 6	87	12. 5

3	Appropriate recovery management and follow up.	21	31.	20	33.	15	22.	4	6.	73	10.
		6	1	3	1	5	3	7	8		5

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

The researcher endeavored to identify various risk mitigation measures that have been adopted specifically for addressing the credit risks prevalent within the Ethiopian Sugar industry. When asked about the systems implemented to assess the creditworthiness of dealers and customers, a significant 70.8% of respondents expressed disagreement with the adequacy of these systems. Meanwhile, 10.2% remained neutral on the matter, and the remaining 18.9% indicated their agreement with the existing systems. These statistics reveal a prevailing belief among most respondents that there exists a substantial gap or deficiency in the current creditworthiness assessment processes. In a related inquiry, respondents were questioned about their perceptions of the provisions made for bad and doubtful debts, which are crucial for accurately determining the financial position of the Company. In this case, 68% of respondents disagreed with the adequacy of these provisions, while 17.1% expressed their agreement, and the remaining 14.8% maintained a neutral stance on the issue.

Regarding the management of appropriate recovery and follow-up practices, 64.2% of the participants indicated dissatisfaction with the efforts currently being employed, whereas 17.3% agreed that the recovery management is satisfactory, and the remaining 22.3% responded neutrally. This feedback underscores the need for better recovery strategies to effectively manage outstanding debts and enhance the overall financial health of the company involved in the sugar industry. Furthermore, the survey examined how well the respondents understood the efficiency of the risk management practices that have been implemented throughout the Ethiopian Sugar industry. When asked about the training provided to staff members on credit risk assessments, a troubling 72.5% of respondents disagreed, highlighting a significant lack of adequate training mechanisms in place. In contrast, only 12.3% endorsed the effectiveness of the current training programs, while 15.2% remained neutral, thereby emphasizing an urgent necessity to improve human resource capabilities in this critical field of credit risk management.

Additionally, participants were queried about the transparency of the credit policies that are currently employed by the company. An overwhelming 75% of respondents reported dissatisfaction with the clarity and comprehensibility of these policies. This suggests that the ambiguity of the guidelines significantly contributes to the ongoing challenges associated with credit risk management. Only 10.5% of those surveyed concurred that the policies are indeed transparent, while the remaining 14.5% maintained a neutral position, revealing a substantial area for improvement in terms of clear communication and effective policy formulation.

When it comes to the monitoring and evaluation of credit risks, a concerning 67.3% of respondents indicated that they believe effective monitoring practices are not in place. This is a significant statistic that points to a broader issue within the

industry. Only 18.6% expressed confidence in the existing monitoring frameworks, signifying serious doubt about their efficacy, while 14.1% opted for a neutral response. The results highlight the critical necessity for the establishment of robust mechanisms capable of continuously assessing and managing credit risks, which is essential for ensuring the long-term sustainability and health of the Ethiopian Sugar industry as a whole.

In conclusion, the findings from this research indicate a pervasive sentiment among industry stakeholders regarding the inadequacies and deficiencies in credit risk management practices, which ultimately pose considerable challenges to the overall financial well-being of the Ethiopian Sugar industry. Therefore, it is imperative that a thorough reassessment of the current systems, training programs, and the transparency of policies be conducted in order to address the identified gaps effectively. By doing so, stakeholders can bolster their credit risk mitigation efforts moving forward, thereby enhancing the resilience and sustainability of the industry against future financial challenges.

Table 11. Survey responses about the risk mitigation strategies (d)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1		2		3		4		5	
		f	%	f	%	f	%	f	%	f	%
1	Outside transport sources are used to tackle the logistics risk	30	4.3	65	9.4	111	16.0	287	41.3	201	29.0

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

To check that risk mitigation measures adopted for the logistics risks, respondents were asked how extent they believe that outside transport sources are used to tackle the logistics risk. while 13.7 % disagreed, 16% neutral and 70.3 % agreed. Furthermore, the responses indicated a significant consensus among the participants regarding the efficacy of these external transport sources. A closer examination reveals that among those who agreed, many acknowledged the pivotal role that third-party logistics providers play in enhancing supply chain resilience. Interestingly, a significant portion of respondents highlighted that the integration of advanced tracking technologies also bolstered their confidence in mitigating potential disruptions.

While the majority of the respondents expressed positive sentiments, the 13.7% who disagreed raised concerns about reliability and cost implications associated with outsourcing transportation. This contemplation suggests a need for organizations to balance the advantages of external support with potential risks. In conclusion, while there is a prevailing belief in the benefits of employing

outside transport sources for managing logistics risks, on-going assessment and adaptation of these measures remain crucial for optimized performance.

Table 11. Survey responses about the risk mitigation strategies (e)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 f	%	2 f	%	3 f	%	4 F	%	5 f	%
1	Raw materials are procured from different sources at competitive prices.	81	11.7	100	14.4	210	30.3	117	16.9	186	26.8
2	Alternative sources are developed for uninterrupted supply of raw materials.	20	2.9	55	7.9	250	36.0	203	29.3	166	23.9
3	The industry takes specific steps to reduce the gap between demand and supply	61	8.8	89	12.8	155	22.3	188	27.1	201	29.0
4	Proper inventory control systems have been put in place	66	9.5	107	15.4	120	17.3	208	30.0	193	27.8

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

The table evaluates the extent to which risk mitigation measures are implemented in relation to market risks. Participants in the survey expressed their level of agreement with several specific statements concerning these measures. To begin with, regarding the statement that "Raw materials are procured from different sources at competitive prices," the results revealed that a total of 26.1% of respondents disagreed with this assertion. Meanwhile, 30.3% remained neutral,

to the sugar industry development risks in Ethiopia?											
1	Company has proper recruitment policy for recruitment of personnel at various levels in the organization.	20	2.9	10 8	15. 6	93	13. 4	29 3	42. 2	18 0	25. 9
2	Proper appraisal system for revision of compensation on a periodical basis has been evolved and followed regularly.	15 1	21. 8	20 4	29. 4	10 6	15. 3	20 0	28. 8	33	4.7
3	Employees are trained at regular intervals to upgrade their skills.	11 7	16. 9	12 3	17. 7	96	13. 8	56	8.1	63	9.1
4	Labor problems are alleviated by negotiations and conciliation.	21 2	30. 5	19 4	27. 9	12 1	17. 4	10 0	14. 4	67	9.6
5	Activities relating to the Welfare of employees are undertaken.	10 9	15. 7	21 7	31. 3	20 2	29. 1	86	12. 4	80	11. 5
6	Employees are encouraged to make suggestions and discuss any problems	14 5	20. 9	20 5	29. 5	17 0	24. 5	10 1	14. 5	73	10. 5

with their
Superiors.

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

In assessing the risk mitigation strategies related to human resource challenges within the sugar industry, a variety of respondents shared their insights concerning several critical aspects. When it came to the question of whether a proper recruitment policy is effectively implemented across different organizational levels, a significant majority of 68.1% indicated their agreement with the existence of such a policy. In contrast, 18.5% of respondents expressed their disagreement, while 13.4% maintained a neutral stance, indicating a slight uncertainty about the policy's effectiveness or presence.

Turning the focus to the existence of a systematic appraisal framework designed for regular compensation review, the findings revealed that a substantial 51.2% of participants disagreed with this notion. Meanwhile, 15.3% remained neutral, neither agreeing nor disagreeing, and 33.5% confirmed their agreement with the assertion regarding the appraisal system's presence. This highlights a significant divide in perceptions of the compensation review process.

Furthermore, the inquiry regarding whether employees routinely receive training aimed at upgrading their skills yielded a response where 34.6% disagreed with the idea of regular skill enhancement training being provided. A smaller portion, representing 13.8%, chose a neutral position on the matter, while 17.2% agreed that such training is indeed a regular occurrence. This suggests a potential area of concern regarding employee development initiatives.

In addressing the issue of labor problems and their resolution through negotiation and conciliation efforts, the results indicated that a notable 58.4% expressed their disagreement with the effectiveness of these methods in alleviating labor issues. Additionally, 17.4% of respondents were neutral in their views, leaving 24% who agreed that negotiations and conciliations play a role in addressing labor-related challenges. This reflects a significant skepticism about the labor management approach currently in place.

With respect to employee welfare activities, the data showed that 47% of participants disagreed with the notion that such activities are adequately provided. Conversely, 29.1% remained neutral, and only 23.9% agreed that employee welfare initiatives are substantial and beneficial. This discrepancy could point to an overarching concern regarding how employee welfare is prioritized within the organization.

Lastly, when discussing whether employees feel encouraged to voice their problems and offer suggestions for improvements to their superiors, the results presented a divided opinion. A slight majority of 50.4% disagreed with the sentiment, suggesting that employees might not feel empowered in raising their concerns. In comparison, 24.5% of respondents maintained a neutral stance, whereas 25% agreed that such an open dialogue is indeed fostered within the work environment. This divergence indicates a crucial area for potential enhancement in communication practices between employees and management.

Table 11. Survey responses about the risk mitigation strategies (g)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	The properties of the company are insured under Industrial	26	3.7	77	11.1	74	10.7	267	38.5	250	36.0
2	Fire extinguishers have been placed at fire sensitive locations.	48	6.9	61	8.8	120	17.3	316	45.5	149	21.5
3	First aid training is given to watch and ward staff and safety personnel.	13	1.9	39	5.6	308	44.4	183	26.4	151	21.8
4	Workmen of the company are covered under ESI, EPF, etc., to serve the welfare of the workmen.	36	5.2	11	1.6	391	56.3	120	17.3	136	19.6
5	All employees are covered by Group Personal Accident Policy.	33	4.7	50	7.2	160	23.0	243	35.0	208	30.0

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

Risk mitigation measures related to disasters and natural hazards are crucial for organizations in various sectors. A recent survey asked respondents about their views on risks associated with the sugar industry in Ethiopia. When asked if company properties are appropriately insured according to standard industrial policies, 14.4% disagreed, indicating worries about inadequate coverage. Meanwhile, 10% remained neutral, suggesting uncertainty, while a substantial 74.5% agreed that the properties are protected under suitable insurance policies.

The survey also addressed fire safety by asking if fire extinguishers are placed in sensitive areas. Results showed that 15.7% disagreed; indicating possible

weaknesses in safety measures, while 17.3% were neutral. A majority of 67% affirmed that fire extinguishers are properly installed in critical locations. Additionally, the survey examined whether first aid training is provided to security and safety personnel. Here, 7.5% disagreed, raising concerns about preparedness for emergencies. A significant 44.4% were neutral, indicating uncertainty about the training, while 48.2% agreed that such training is being implemented.

The survey also looked into the coverage of workers under the Employee State Insurance (ESI) and the Employees' Provident Fund (EPF). In this area, 6.8% disagreed, possibly reflecting concerns about employee benefits. A notable 56.3% took a neutral stance, suggesting indecision, while 36.9% agreed that employee welfare is adequately addressed through these provisions.

Finally, the survey assessed whether all employees benefit from a Group Personal Accident Policy. Results revealed that 11.9% disagreed, indicating potential gaps in accident insurance. Twenty-three percent chose a neutral position, while 65% agreed that such a policy is in place, highlighting a strong consensus on the importance of protecting employees against personal accidents while they work.

Table 11. Survey responses about the risk mitigation strategies (h)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 f	%	2 f	%	3 f	%	4 f	%	5 f	%
1	Electronic Data Processing department maintains repairs and upgrades the systems on a continuous basis with personnel who are trained in software and hardware.	17	2.4	39	5.6	291	41.9	250	36.0	97	14.0
2	Password protection is provided at different levels to ensure data integrity.	41	5.9	43	6.2	331	47.7	139	20.0	140	20.2
3	Licensed software is being used in the systems.	68	9.8	103	14.8	366	52.7	101	14.5	56	8.1
4	The Company ensures "Data Security" by having access control/restrictions.	56	8.1	67	9.6	403	58.1	90	13.0	78	11.2

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

In the table above, respondents have expressed their views on the risk mitigation measures implemented to address system risks. Within the Electronic Data Processing department, systems are continuously maintained, repaired, and upgraded by skilled personnel proficient in both software and hardware. It is noteworthy that 8% of the respondents disagreed with this approach, while 41.9% remained neutral, and 50% expressed their agreement. Additionally, respondents were asked to what extent they concurred with the provision of password protection at various levels to ensure data integrity. The results showed that 12.1% disagreed, 47.7% were neutral, and 42.2% agreed. When it comes to the utilization of licensed software in the systems, 24.6% disagreed, 52.7% remained neutral, and 22.6% agreed. Furthermore, with regard to the company's assurance of "Data Security" through access control and restrictions, 17.7% disagreed, 58.1% were neutral, and 24.2% expressed their agreement.

Table 11. Survey responses about the risk mitigation strategies (i)

S. No.	To what extent do you agree or disagree with the following statements with regards to the sugar industry development risks in Ethiopia?	1 f	%	2 f	%	3 F	%	4 f	%	5 f	%
1	A study of contracts with focus on contractual liabilities, deductions, penalties and interest conditions is undertaken on a regular basis.	78	11.2	90	13.0	350	50.4	70	10.1	106	15.3
2	The Legal department vets all legal and contractual documents with legal advice from Legal retainers for different branches of legislation.	33	4.7	20	2.9	314	45.2	179	25.8	148	21.3

3	Insurance policies are audited to avoid any later disputes.	0	0.0	12	1.7	361	52.0	209	30.1	112	16.1
4	Timely payment of insurance and full coverage of properties of the Company under insurance.	3	0.4	5	0.7	403	58.1	165	23.8	118	17.0
5	Internal control systems for proper control on the operations of the Company and to detect any frauds.	61	8.8	87	12.5	413	59.5	80	11.5	53	7.6

(1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree, 5= Strongly agree)

The above table indicates that the researcher evaluated the extent to which risk mitigation measures were implemented to address legal risks. Respondents were initially asked to indicate their level of agreement regarding various aspects of contracts, including contractual liabilities, deductions, penalties, and interest conditions. The results showed that 24.2% disagreed, 50.4% were neutral, and 25.4% agreed. Furthermore, the Legal department examines all legal and contractual documents with input from legal retainers specializing in different areas of legislation. The responses indicated that 7.6% disagreed, 45.2% were neutral, and 47.1% agreed with this practice. The assessment also looked into the auditing of insurance policies to prevent potential disputes, with 1.7% in disagreement, 52% neutral, and 46.2% in agreement. Additionally, the timely payment of insurance premiums and comprehensive coverage of the company's properties under insurance was addressed. The feedback revealed that 1.1% disagreed, 58.1% were neutral, and 40.8% agreed with this practice. Finally, the participants were asked to provide their opinions on the effectiveness of internal control systems for overseeing the company's operations and detecting potential fraudulent activities. The results showed that 21.3% disagreed, 59.5% were neutral, and 19.1% agreed with the effectiveness of these control systems.

6. Conclusions

The Ethiopian sugar industry is also vulnerable to various risks that pose challenge to the industry's growth and development strategy implementation. Key concerns identified include:

- a. **Logistics and transportation cost:** Transporting both raw materials and finished sugar products across Ethiopia is expensive due to various factors, including rising fuel costs, poor road infrastructure, and the

reliance on long-distance trucking. These costs are passed down the supply chain, making locally produced sugar more expensive and less competitive than imported sugar. The lack of efficient logistics management systems further exacerbates the issue. **Inefficient Logistics Management Systems:** There is a lack of modern logistics and supply chain management systems within the Ethiopian sugar industry. Most of the sugar factories rely on traditional methods of managing transport and inventory, which are prone to errors and inefficiencies. This leads to delays in deliveries, poor coordination between different parts of the supply chain, and higher operational costs. The absence of an integrated logistics platform means that tracking the movement of goods, managing inventory levels, and optimizing transport routes are challenging tasks, further adding to the inefficiency.

- b. Regulatory Barriers and Bureaucracy:** Lengthy bureaucratic processes and inconsistent regulations increase the time and cost of moving goods within the country and to international markets. Customs clearance procedures at the Djibouti port are often slow, causing delays in the export of sugar. Additionally, transportation permits and regulations on vehicle load limits can cause further delays and inefficiencies. Unpredictable government policies related to tariffs and import/export restrictions also create uncertainty for the sugar sector, which hampers long-term planning and investment in more efficient logistics solutions. **Lack of Investment in Modern Transportation Technologies:** The Ethiopian sugar industry faces limited investment in modern transportation technologies, such as refrigerated vehicles (for sugarcane transport), automated tracking systems, and efficient warehouse management systems. The use of out dated vehicles and transport equipment increases the risk of breakdowns, delays, and spoilage of sugarcane, particularly over long distances. Additionally, there is limited adoption of digital technologies that could enhance logistics operations, such as real-time tracking of goods or automated warehouse management systems, further contributing to inefficiencies and higher operational costs.
- c. Human resources development. Human Resources Development (HRD)** is critical to the success of any industry, including the sugar sector in Ethiopia. As the country seeks to increase its sugar production to meet domestic needs and become a key player in international markets, the development of its workforce becomes a key determinant of the industry's future. However, the Ethiopian sugar sector faces several human resource challenges such as technical and managerial skill gap that limit its productivity, efficiency, and competitiveness. Moreover, continuous training and professional development programs for employees is limited in the industry in general. Further, high employee turnover is a significant issue in Ethiopia's sugar sector. Many workers, particularly those with technical skills, leave the sector in search of better-paying jobs or opportunities for career advancement in other industries. Working conditions in the Ethiopian sugar sector do not meet the standards required to attract and retain skilled workers. Long hours, physically demanding tasks, limited access to health and safety provisions, and inadequate housing or welfare services are some of the common issues workers face. These poor working conditions contribute to dissatisfaction

among employees and hinder efforts to build a motivated and productive workforce. Moreover, labour relations between management and workers are often strained, with frequent disputes over wages, working hours, and benefits.

- d. Financial availability:** Access to finance is crucial for the expansion of sugar production, modernization of processing plants, and the improvement of transport and logistics. However, access to long-term financing is limited in Ethiopia's sugar industry. The sugar producers struggle to access long-term loans from domestic financial institutions. Commercial banks are often hesitant to provide large-scale, long-term financing due to the perceived risks associated with agricultural investments. As a result, many sugar projects experience delays or remain underfunded, limiting their capacity to expand production or modernize operations.
- e. High Interest Rates and Cost of Capital** are also key challenging issues in the Ethiopian sugar industry. Even if financing is available, the cost of borrowing is prohibitively high. Interest rates in Ethiopia are generally elevated due to factors such as inflationary pressures, macroeconomic instability, and a shortage of foreign currency reserves. The high cost of capital poses a significant burden on sugar companies, which already operate on thin margins due to fluctuating sugar prices and high operational costs. These high interest rates make it difficult for sugar producers to invest in modern machinery, improve agricultural productivity, or expand their operations. The lack of affordable credit further restricts the sector's ability to compete internationally, as other sugar-producing countries may have access to cheaper capital and more favorable financing conditions. In the meantime, foreign currency shortage poses a major challenge for the sugar industry. Sugar production requires substantial imports of machinery, spare parts, fertilizers, and chemicals, all of which must be paid for in foreign currency. The difficulty in obtaining foreign currency restricts the ability of sugar producers to import these essential inputs, leading to operational inefficiencies and increased production costs. Additionally, the lack of foreign exchange affects the ability of Ethiopian sugar producers to participate in international markets. Export-oriented producers face delays in repatriating their earnings, which can disrupt cash flow and limit their ability to reinvest in production or expand their business. Last, but not least, insufficient government financing and support while being heavily involved in the industry is another financial challenging issue in the sugar industry. Large-scale sugar projects, many of which are government-backed, have suffered from delays and budget shortfalls due to inadequate funding. Government-owned sugar factories, such as those under the Ethiopian Sugar Industry Group, often struggle with financial mismanagement, inefficiencies, and a lack of timely funding for expansion projects. As a result, the pace of development in the sector is slowed, limiting the ability to meet domestic demand or expand into export markets. Moreover, while the government has attempted to attract private investment through Public-Private Partnerships (PPPs), the financial incentives and guarantees provided have not been sufficient to entice private sector investors. This has led to an overreliance on government

financing, which is often limited due to competing priorities and budget constraints.

- f. Lack of private sector investment:** Attracting private sector investment into the Ethiopian sugar industry has been a major challenge. The sector is dominated by state-owned enterprises, which have historically received the bulk of government financing and support. However, private investors are wary of entering the market due to regulatory uncertainties, bureaucratic delays, and concerns about property rights and investment protection. Additionally, the absence of a well-developed capital market in Ethiopia has been limiting the ability of sugar companies to raise funds through equity or debt offerings. The lack of financial instruments, such as bonds or publicly traded shares, further restricts private sector participation, leaving the industry dependent on traditional bank loans, which are often insufficient.
- g. Limited access to agricultural credit schemes:** Although Ethiopia has several agricultural credit schemes in place, these programs are often poorly designed and difficult for sugar producers to access. Many credit programs are focused on smallholder farmers or staple crops, such as maize or wheat, rather than on large-scale commercial agriculture like sugar production. As a result, sugar producers are often excluded from these schemes or find the terms of the loans unattractive. Moreover, the criteria for accessing agricultural credit, such as collateral requirements or repayment conditions, are often too restrictive for many sugar producers. This limits their ability to take advantage of government credit schemes, further exacerbating the financial challenges faced by the sector.

7. Recommendations

The study has shown up several risk factors that has been posing challenges to the development of the sugar industry in Ethiopia. Addressing these risk factors through proactive measures and strategic planning help to ensure the sustainable development of the sugar industry. Therefore, the Ethiopian Sugar Industries Group should incorporate effective risk mitigation strategies in the proposed industry's policy so that the industry can operate more smoothly and sustainably. It is also essential to implement comprehensive credit risk management and recovery strategies to address bad debt risks. Regular stress tests will help assess the organization's financial resilience, while improved contingency planning for liquidity and operational risks will prepare it for unexpected challenges.

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