International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Analysis of Sustainable Rice Supply Chain Model Using Supply Chain Operations Reference (SCOR) in Sidenreng Rappang Regency

Desmah Fajriani[1], Carles Sitompul[2]
[1,2] Master of Industrial Engineering, Parahyangan Catholic University

ABSTRACT: Indonesia is a country where most of its population lives from agriculture, making the agricultural industry sector an important industry for people's lives. One of the commodities in this sector is rice, which is the raw material for rice production. Indonesia is ranked first in ASEAN countries with the highest rice and rice production based on data from the ASEAN Statistical Year Book 2021, where rice production was 55.53 million metric tons in 2020. Sidenreng Rappang Regency is known for its high rice production. The purpose of this study is to analyze whether the sustainable rice supply chain model in Sidenreng Rappang Regency has been running well or not. This study uses the Supply Chain Operations Reference (SCOR) method, and the populations studied are farmers, rice mills, and seller. The first stage of work in this study is to identify levels 1, 2, and 3 of the KPI SCOR for each population. The second phase involves determining the score for level 3. The third stage involves determining the weight of each level. The fourth stage determines the final value of levels 3, 2, and 1 of all populations. Based on the analysis conducted, the total value of supply chain performance for the farmer population was 38.28. Rice milling resulted in a total value of supply chain performance of 53.19. 53.02 was the total value of the seller population and 53.02 was the performance of the supply chain.

KEY WORDS: Rice, Sustainability, Supply Chain, & Supply Chain Operations Reference (SCOR).

INTRODUCTION

The agricultural industry sector is an important industry for people's lives in Indonesia, where the majority of its population lives from agriculture. Rice, which is the raw material for rice, is a commodity in this sector. Indonesia is ranked first in ASEAN countries with the largest rice and rice production based on data from the ASEAN Statistical Year Book 2021, where rice production was 55.53 million metric tons in 2020. Sidenreng Rappang Regency in South Sulawesi Province is a region that produces the most rice. Supply chain is a network of companies that work together to create and deliver products to the end user. These companies usually include suppliers, factories, distributors, shops, and retailers, as well as supporting companies such as logistics service companies (I Nyoman, et., al., 2017). The rice product logistics system has certain characteristics and requires special and different handling, because it is influenced by the production system, product properties, harvesting methods and post-harvest handling, and consumer preferences. The rice supply chain in production centers involves many actors, from farmers, the rice milling industry, trade actors, and consumers.

According to the Brundtland Commission (1987) sustainability is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Therefore, there are several main pillars or main aspects in sustainability; Environment which includes the ability to maintain environmental balance, maintain good air and water quality, and minimize negative impacts on the environment. The economy focuses on sustainable and responsible economic growth, with attention to efficiency, innovation, and quality of life. Social welfare refers to the distribution of human rights, health, education, and social justice. The sustainable rice supply chain aims to ensure that rice production, processing, distribution, and consumption are conducted with consideration for sustainable environmental, social, and economic aspects.

The Supply Chain Operations Reference (SCOR) method is used in this study as a reference model for supply chain operations. SCOR is basically also a process-based model. There are several previous studies that use SCOR as a method for completing their research, including; "Rice Supply Chain Performance in Karawang Regency" by Ahmad Irfan Murmahdy, Machfud and M. Faiz Syuaib in 2020 which stated that the performance metric values of farmers and collectors were not appropriate. "Analysis of Rice Supply Chain Management with the SCOR Model Approach" by Faridz Adi Nurmansyah, Robi Awaluddin, Ayus Ahmad Yusuf in 2022 with the results of his research stating that over all the company's performance was running well. “Analysis of Rice Supply Chain Performance Using the Supply Chain Operations Reference (SCOR) Model and Analytical Hierarchy Process

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

(AHP) Method (Case Study: CV. Meutuah Baro Kuta Baro Aceh Besar District) from Defrizal, Lukman Hakin and Suyanti in 2020 with research results saying that the final SCOR value was 64% which means it is quite good.

The population that was studied is different from previous studies. The purpose of this study is to analyze whether the sustainable rice supply chain model in Sidenreng Rappang Regency has been running well or not.

RESEARCH METHODS

This research combines qualitative and quantitative methods. Online questionnaires were distributed to the population studied (Farmers, Rice Mills, and Seller) to collect data. The steps involved in problem-solving in this study are as follows:

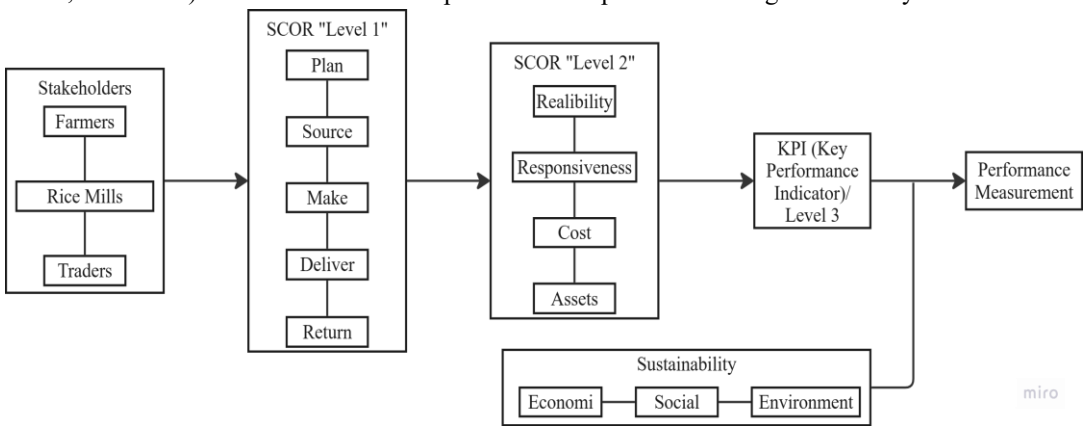

Figure 1: Research Models

Explanation Figure 1:

1. Identify supply chain activities (business processes and sub-processes) to serve as performance measurement points for the populations studied.
2. Categorize activities into SCOR levels while integrating sustainability aspects.
3. Compile KPI scores (Level 3) obtained from the questionnaires.
4. Assign weights to each SCOR level.
5. Calculate the final KPI value (Level 3) for each population.
6. Determine the overall indicator values (Level 2) for each population.

Compute the total final performance value (Level 1) for each population using the Snorm De Boer formula.The performance calculation employs the Snorm De Boer equation (Ade, 2018).

Monitoring System	*Performance Indicator*
< 40	*Poor*
$40 - 50$	*Marginal*
$50 - 70$	*Average*
$70 - 90$	*Good*
> 90	*Excellent*

Figure 2: Monitoring Performance Indicators
Source: Ade, 2018

RESULTS AND DISCUSSION

1. SCOR Calculation for Farmers

The initial step involves identifying the business process activities (Level 1) and sub-business processes (Level 2) to be assessed. Subsequently, the KPI scores (Level 3) are calculated based on the responses from the distributed questionnaires, followed by assigning weights to each level.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Table 1: Calculation of weights for each level and scoring on KPIs

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
Plan	0,178	Reliability	0,136	PR1	The requirement for rice seeds has been planned based on the size of the land to be cultivated	46	0,2
				PR2	The planning for additional raw materials aligns with the actual needs	62	0,2
				PR3	The rice planting process follows the established schedule	52	0,2
				PR4	The rice planting process complies with existing operational standards	39	0,2
				PR5	The workforce requirements have been planned according to demand	43	0,2
		Responsiveness	0,168	PRE1	Production quantity planning is aligned with market demand	50	0,5
				PRE2	Product delivery schedules are planned in accordance with customer requests	44	0,5
		Cost/ Economy	0,143	PC1	Production costs are planned to remain affordable	42	1
		Assets	0,259	PA1	Sales targets are aligned with expected outcomes	24	1
		Sustainability					
		Social	0,126	PS1	Workforce planning ensures adequate wages and access to health facilities	54	0,333
				PS2	Training programs are planned to enhance workers' skills	45	0,333
				PS3	Fair policies are planned to ensure equal treatment for all workers	46	0,333
		Environment	0,168	PE1	Proper water management is planned for irrigation purposes	43	0,5
				PE2	The use of fertilizers and pesticides is planned appropriately	22	0,5

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
Source	0,172	Reliability	0,155	SR1	Delivery of additional materials matches the ordered quantity	59	0,333
				SR2	The specifications of the additional materials align with the required standards	52	0,333
				SR3	Additional materials are consistently available from suppliers	33	0,333
		Responsiveness	0,168	SRE1	Suppliers deliver additional materials within the agreed timeframe	21	1
		Cost/ Economy	0,165	SC1	Shipping costs for additional materials remain affordable	32	1
		Sustainability					
		Social	0,259	SS1	Foster strong, long-term relationships with suppliers through cooperation	35	1
		Environment	0,253	SE1	Select suppliers who are GoGreen certified or prioritize environmentally friendly practices	47	1
Make	0,244	Reliability	0,165	MR1	The rice seed planting process adheres to the specified schedule	64	0,2
				MR2	Raw materials are readily available during the planting process	28	0,2
				MR3	Additional materials are adequately supplied during the planting process	55	0,2
				MR4	The products meet the required quality standards	21	0,2
				MR5	The packaging process follows standard operating procedures	18	0,2
		Responsiveness	0,145	MRE 1	Respond promptly to planting demands based on consumer requirements	27	1
		Cost/ Economy	0,202	MC1	Maintain affordable production costs	30	1
		Assets	0,154	MA1	Effectively manage finished product inventory	18	1
		Sustainability					

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
		Social	0,221	MS1	Uphold and respect workers' rights	56	0,5
				MS2	Ensure a safe and conducive working environment	28	0,5
		Environment	0,113	ME1	Reduce and recycle production waste	38	0,5
				ME2	Utilize environmentally friendly raw materials and equipment	32	0,5
Deliver	0,134	Reliability	0,206	DR1	The quantity of product deliveries aligns with consumer preferences	57	0,5
				DR2	The quality of products delivered meets consumer expectations	55	0,5
		Responsiveness	0,187	DRE1	Product deliveries are made on time	39	1
		Cost/ Economy	0,29	DC1	Shipping costs for products (paddy) remain affordable	37	1
		Sustainability					
		Social	0,169	DS1	Foster strong relationships with consumers through excellent service	61	1
		Environment	0,148	DE1	Minimize carbon emissions during the delivery process	58	0,333
				DE2	Use environmentally friendly packaging materials	65	0,333
				DE3	Optimize delivery routes and methods to reduce environmental impact	46	0,333
Return	0,272	Reliability	0,356	RR1	The process of returning products that do not meet consumer specifications is handled efficiently	42	1
		Responsiveness	0,06	RRE1	The company is committed to replacing products that fail to meet specifications	52	1
		Cost/ Economy	0,229	RC1	The cost of returning non-compliant products is kept affordable	44	1
		Sustainability					
		Social	0,223	RS1	Ensure the product return process prioritizes consumer comfort and satisfaction	41	1

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
		Environment	0,133	RE1	Minimize the environmental impact associated with the product return process	48	0,5
				RE2	Effectively manage waste generated from returned products	44	0,5

Table 2: Final KPI Scores

Business Process (Level 1)	Indicator (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Plan	Reliability	PR1	46	0.2	9.2	48.4
		PR2	62	0.2	12.4	
		PR3	52	0.2	10.4	
		PR4	39	0.2	7.8	
		PR5	43	0.2	8.6	
	Responsiveness	PRE1	50	0.5	25	47
		PRE2	44	0.5	22	
	Cost/ Economy	PC1	42	1	42	42
	Assets	PA1	24	1	24	24
	Sustainability					
	Social	PS1	54	0.333	18	48,333
		PS2	45	0.333	15	
		PS3	46	0.333	15,333	
	Environment	PE1	43	0.5	21.5	32.5
		PE2	22	0.5	11	
Source	Reliability	SR1	59	0.333	19.666	48
		SR2	52	0.333	17,333	
		SR3	33	0.333	11	
	Responsiveness	SRE1	21	1	21	21
	Cost/ Economy	SC1	32	1	32	32
	Sustainability					
	Social	SS1	35	1	35	35
	Environment	SE1	47	1	47	47
Make	Reliability	MR1	64	0.2	12.8	37.2
		MR2	28	0.2	5.6	
		MR3	55	0.2	11	
		MR4	21	0.2	4.2	
		MR5	18	0.2	3.6	
	Responsiveness	MRE1	27	1	27	27
	Cost/ Economy	MC1	30	1	30	30
	Assets	MA1	18	1	18	18

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicator (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
	Sustainability					
	Social	MS1	56	0.5	28	42
		MS2	28	0.5	14	
	Environment	ME1	38	0.5	19	35
		ME2	32	0.5	16	
Deliver	Reliability	DR1	57	0.5	28.5	56
		DR2	55	0.5	27.5	
	Responsiveness	DRE1	39	1	39	39
	Cost/ Economy	DC1	37	1	37	37
	Sustainability					
	Social	DS1	61	1	61	61
	Environment	DE1	58	0.333	19,333	56,333
		DE2	65	0.333	21.666	
		DE3	46	0.333	15,333	
Return	Reliability	RR1	42	1	42	42
	Responsiveness	RRE1	52	1	52	52
	Cost/ Economy	RC1	44	1	44	44
	Sustainability					
	Social	RS1	41	1	41	41
	Environment	RE1	48	0.5	24	46
		RE2	44	0.5	22	

Table 3: Final Values of the Indicators

Business Process (Level 1)	Indicators (Level 2)	Score	Weight	Performance Value (Score x Weight)	Total Indicator
Plan	Reliability	48.4	0.136	6,572	32.514
	Responsiveness	47	0.168	7,881	
	Cost/ Economy	2	0.143	0.286	
	Assets	24	0.259	6,213	
	Social	48.3	0.126	6,109	
	Environment	32.5	0.168	5.450	
Source	Reliability	48	0.155	7.44	37,202
	Responsiveness	21	0.168	3,530	
	Cost/ Economy	32	0.165	5,289	
	Social	35	0.259	9.047	
	Environment	47	0.253	11,895	
Make	Reliability	37.2	0.165	6,145	32,131
	Responsiveness	27	0.145	3,920	
	Cost/ Economy	30	0.202	6,066	
	Assets	18	0.154	2,763	

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicators (Level 2)	Score	Weight	Performance Value (Score x Weight)	Total Indicator
	Social	42	0.221	9,282	
	Environment	35	0.113	3,955	
Deliver	Reliability	56	0.206	11,547	48,201
	Responsiveness	39	0.187	7,2891	
	Cost/ Economy	37	0.29	10,737	
	Social	61	0.169	10,290	
	Environment	56.3	0.148	8,337	
Return	Reliability	42	0.356	14,947	43,366
	Responsiveness	52	0.06	3,130	
	Cost/ Economy	44	0.229	10,058	
	Social	41	0.223	9,130	
	Environment	46	0.133	6,099	

Table 4: Total Value of Farmer Supply Chain Performance

Business Process (Level 1)	Score	Weight	Performance Value (Score x Weight)
Plan	32,514	0.178	5.800
Source	37,202	0.171	6.380
Make	32,131	0.244	7.843
Deliver	48,201	0.134	6.478
Return	43,366	0.271	11.778
Total			**38.281**

2. SCOR Calculation for Rice Mills

The initial step involves identifying the business process activities (Level 1) and sub-business processes (Level 2) to be assessed. Subsequently, the KPI scores (Level 3) are calculated based on the responses from the distributed questionnaires, followed by assigning weights to each level.

Table 5: Calculation of weights for each level and scoring on KPIs

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
Plan	0,255	Reliability	0,168	PR1	The demand for paddy has been planned appropriately	67	0,166
				PR2	Additional material planning has been aligned with specific needs	35	0,166
				PR3	The production process has been scheduled and	48	0,166

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
					executed accordingly		
				PR4	The production process adheres to standard operating procedures	63	0,166
				PR5	The workforce has been planned in accordance with requirements	55	0,166
				PR6	Production capacity aligns with market demand	57	0,166
		Responsiveness	0,212	PRE1	The quantity of production is planned based on consumer needs	43	0,5
				PRE2	Product delivery planning corresponds to consumer demands	47	0,5
		Cost/ Economy	0,170	PC1	The cost of production planning is affordable	78	1
		Assets	0,217	PA1	Sales meet the expected targets	47	1
		Sustainability					
		Social	0,076	PS1	Workforce planning gets adequate wages and health facilities	37	0,333
				PS2	Planning training programs to improve workers' skills	52	0,333
				PS3	Planning for the implementation of fair policies for all workers	55	0,333
		Environment	0,155	PE1	Planning the use of environmentally friendly energy in	45	0,5

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
					the production process		
				PE2	Waste and emission reduction planning	68	0,5
Source	0,070	Reliability	0,218	SR1	Delivery of additional materials according to the amount ordered	54	0,333
				SR2	The specifications of the additional materials ordered are in accordance with what is desired	49	0,333
				SR3	Additional materials are always available from suppliers	60	0,333
		Responsiveness	0,212	SRE1	Delivery of paddy according to the agreed time	63	0,5
				SRE2	Delivery of additional materials according to the agreed time	50	0,5
		Cost/ Economy	0,301	SC1	Affordable shipping costs for raw materials (paddy)	45	0,5
				SC2	Affordable additional material shipping costs	55	0,5
		Sustainability					
		Social	0,103	SS1	Building good relationships with suppliers for the long term (cooperation)	66	1
		Environment	0,164	SE1	Choose suppliers who are Gogreen certified or environmentally friendly	54	1

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
Make	0,095	Reliability	0,077	MR1	The production process is in accordance with the production schedule	58	0,2
				MR2	The amount of raw materials is available during the production process	58	0,2
				MR3	The amount of additional materials is already available during the production process	54	0,2
				MR4	The products produced are in accordance with the specified quality	58	0,2
				MR5	The packaging process is in accordance with standard operating procedures	44	0,2
		Responsiveness	0,138	MRE1	Responsiveness in producing products according to consumer demand	62	1
		Cost/ Economy	0,221	MC1	Affordable production costs	46	1
		Assets	0,277	MA1	Able to manage finished product inventory	50	1
		Sustainability					
		Social	0,098	MS1	Maintain and respect workers' rights	58	0,5
				MS2	Ensuring a safe and good working environment	63	0,5
		Environment	0,18	ME1	Reducing and recycling production waste	70	0,5

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
				ME2	Using environmentally friendly raw materials and equipment	57	0,5
Deliver	0,222	Reliability	0,344	DR1	The number of product deliveries is in accordance with consumer desires	51	0,5
				DR2	The quality of the products sent to consumers is in accordance with consumer desires.	45	0,5
		Responsiveness	0,230	DRE1	Delivery of products produced on time	53	1
		Cost/ Economy	0,258	DC1	Shipping costs to consumers are affordable	37	1
		Sustainability					
		Social	0,090	DS1	Maintain good relations with consumers with satisfactory service	64	1
		Environment	0,076	DE1	Reducing carbon emissions during the shipping process	55	0,333
				DE2	Use of environmentally friendly packaging materials	51	0,333
				DE3	Optimizing delivery routes and methods to reduce environmental impact	57	0,333
Return	0,356	Reliability	0,33	RR1	The process of returning products that do not meet consumer	50	1

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	*Key Performance Indicators* (Level 3)	Score	Weight
					specifications has been well served		
		Responsiveness	0,342	RRE1	The company is willing to replace products that do not meet specifications	43	1
		Cost/ Economy	0,191	RC1	The cost of returning products that do not meet specifications is affordable	73	1
		Sustainability					
		Social	0,043	RS1	Ensure that the product return process is carried out with consumer comfort and satisfaction in mind	68	1
		Environment	0,093	RE1	Reducing the environmental impact of the product return process	70	0,5
				RE2	Managing waste generated from returned products	69	0,5

Table 6: Final KPI Scores

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Plan	Reliability	PR1	67	0,166	11,166	54,166
		PR2	35	0,166	5,833	
		PR3	48	0,166	8	
		PR4	63	0,166	10,5	
		PR5	55	0,166	9,166	
		PR6	57	0,166	9,5	
	Responsiveness	PRE1	43	0,5	21,5	45
		PRE2	47	0,5	23,5	
	Cost/ Economy	PC1	78	1	78	78
	Assets	PA1	47	1	47	47
	Sustainability					
	Social	PS1	37	0,333	12,333	48

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
		PS2	52	0,333	17,333	
		PS3	55	0,333	18,333	
	Environment	PE1	45	0,5	22,5	56,5
		PE2	68	0,5	34	
Source	Reliability	SR1	54	0,333	18	54,333
		SR2	49	0,333	16,333	
		SR3	60	0,333	20	
	Responsiveness	SRE1	63	0,5	31,5	56,5
		SRE2	50	0,5	25	
	Cost/ Economy	SC1	45	0,5	22,5	50
		SC2	55	0,5	27,5	
	Sustainability					
	Social	SS1	66	1	66	66
	Environment	SE1	54	1	54	54
Make	Reliability	MR1	58	0,2	11,6	54,4
		MR2	58	0,2	11,6	
		MR3	54	0,2	10,8	
		MR4	58	0,2	11,6	
		MR5	44	0,2	8,8	
	Responsiveness	MRE1	62	1	62	62
	Cost/ Economy	MC1	46	1	46	46
	Assets	MA1	50	1	50	50
	Sustainability					
	Social	MS1	58	0,5	29	60,5
		MS2	63	0,5	31,5	
	Environment	ME1	70	0,5	35	63,5
		ME2	57	0,5	28,5	
Deliver	Reliability	DR1	51	0,5	25,5	48
		DR2	45	0,5	22,5	
	Responsiveness	DRE1	53	1	53	53
	Cost/ Economy	DC1	37	1	37	37
	Sustainability					
	Social	DS1	64	1	64	64
	Environment	DE1	55	0,333	18,333	54,333
		DE2	51	0,333	17	
		DE3	57	0,333	19	
Return	Reliability	RR1	50	1	50	50
	Responsiveness	RRE1	43	1	43	43
	Cost/ Economy	RC1	73	1	73	73
	Sustainability					

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
	Social	RS1	68	1	68	68
	Environment	RE1	70	0,5	35	69,5
		RE2	69	0,5	34,5	

Table 7: Final Values of the Indicators

Business Process (Level 1)	Indicators (Level 2)	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Plan	Responsiveness	45	0,212	9,562	54,614
	Cost/ Economy	78	0,170	13,275	
	Assets	47	0,217	10,208	
	Social	48	0,076	3,672	
	Environment	56,5	0,155	8,768	
Source	Reliability	54,333	0,218	11,877	54,635
	Responsiveness	56,5	0,212	11,989	
	Cost/ Economy	50	0,301	15,09	
	Social	66	0,103	6,817	
	Environment	54	0,164	8,861	
Make	Reliability	54,4	0,077	4,1942	54,662
	Responsiveness	62	0,138	8,599	
	Cost/ Economy	46	0,221	10,184	
	Assets	50	0,277	13,89	
	Social	60,5	0,098	5,983	
	Environment	63,5	0,18	11,811	
Deliver	Reliability	48	0,344	16,516	48,256
	Responsiveness	53	0,230	12,216	
	Cost/ Economy	37	0,258	9,546	
	Social	64	0,090	5,804	
	Environment	54,333	0,076	4,172	
Return	Reliability	50	0,33	16,5	54,603
	Responsiveness	43	0,342	14,723	
	Cost/ Economy	73	0,191	13,972	
	Social	68	0,043	2,930	
	Environment	69,5	0,093	6,477	

Table 8: Total Value of Rice Mills Supply Chain Performance

Business Process (Level 1)	Score	Weight	Performance Value (Score x Weight)
Plan	54,61	0,255	13,964
Source	54,64	0,070	3,829
Make	54,66	0,095	5,236
Deliver	48,26	0,222	10,713
Retrun	54,6	0,356	19,455
Total			**53,199**

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

3. SCOR Calculation for Seller
The initial step involves identifying the business process activities (Level 1) and sub-business processes (Level 2) to be assessed. Subsequently, the KPI scores (Level 3) are calculated based on the responses from the distributed questionnaires, followed by assigning weights to each level.

Table 9: Calculation of weights for each level and scoring on KPIs

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
Plan	3,153	Reliability	0,128	PR1	Rice needs have been planned according to market demand	49	0.25
				PR2	Additional material planning has been planned according to needs	50	0.25
				PR3	Marketing planning has been implemented with standard operating procedures	46	0.25
				PR4	The number of workers has been planned according to needs	51	0.25
		Responsiveness	0.023	PRE1	Planning the number of products sold is in accordance with consumer demand	60	0.5
				PRE2	Product delivery planning according to consumer demand	57	0.5
		Cost/Economy	0,115	PC1	Affordable promotional and marketing planning costs	55	1
		Assets	0,217	PA1	Sales are in line with expected targets	55	1
		Sustainability					
		Social	0,131	PS1	Workforce planning gets adequate wages and health facilities	51	0,231
				PS2	Planning training programs to improve workers' skills	53	0,231
				PS3	Planning for the implementation of	58	0,231

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
					fair policies for all workers		
		Environment	0,086	PE1	Planning the use of environmentally friendly packaging	53	0.5
				PE2	Waste and emission reduction planning	54	0.5
Source	0,716	Reliability	0,112	SR1	Delivery of the number of products (rice) according to the amount ordered	49	0.25
				SR2	The specifications of the additional materials ordered are in accordance with what is desired.	57	0.25
				SR3	Additional materials are always available from suppliers	64	0.25
				SR4	Delivery of additional materials according to the amount ordered	45	0.25
		Responsiveness	0,095	SRE1	Delivery of products (rice) according to the agreed time	53	0.5
				SRE2	Delivery of additional materials according to the agreed time	60	0.5
		Cost/Economy	0,104	SC1	Affordable product (rice) shipping costs	42	0.5
				SC2	Affordable additional material shipping costs	51	0.5
		Sustainability					
		Social	0,231	SS1	Building good relationships with suppliers for the long term (cooperation)	41	1
		Environment	0,15	SE1	Choose suppliers who are Gogreen certified or	59	1

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
					environmentally friendly		
Make	1,2236	Reliability	0,13	MR1	The marketing process is in accordance with the established schedule	47	0,115
				MR2	The number of products (rice) is available during the sales process	54	0,115
				MR3	The amount of additional materials is already available during the sales process.	64	0,115
				MR4	The products sold are in accordance with the specified quality	59	0,11
				MR5	repacking process is in accordance with standard operating procedures	56	0,115
				MR6	The promotion process is in accordance with the established schedule	57	0,115
		Responsiveness	0,086	MRE1	Responsiveness and reliability in promoting products according to consumer desires	56	0.5
				MRE2	Responsiveness in selling products according to consumer desires	50	0.5
		Cost/Economy	0,072	MC1	Affordable promotion costs	36	0.5
				MC2	Affordable marketing costs	44	0.5
		Assets	0,224	MA1	Able to manage product inventory (rice)	53	1
		Sustainability					

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
		Social	0,115	MS1	Maintain and respect workers' rights	50	0.5
				MS2	Ensuring a safe and good working environment	57	0.5
		Environment	0,106	ME1	Reducing and recycling waste used in repacking	48	0.5
				ME2	Using environmentally friendly additives and equipment	53	0.5
Deliver	0,093	Reliability	0,254	DR1	The number of product deliveries is in accordance with consumer desires	50	0.5
				DR2	The quality of the products sent to consumers is in accordance with consumer desires.	51	0,5
		Responsiveness	0,070	DRE1	Delivery of products produced on time	57	1
		Cost/ Economy	0.046	DC1	Shipping costs to consumers are affordable	61	1
		Sustainability					
		Social	0,077	DS1	Maintain good relations with consumers with satisfactory service	52	1
		Environment	0,260	DE1	Reducing carbon emissions during the shipping process	56	0,5
				DE2	Optimizing delivery routes and methods to reduce environmental impact	49	0,5
Return	0,920	Reliability	0,246	RR1	The process of returning products that do not meet consumer	60	1

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Weight	Indicators (Level 2)	Weight	Code	Key Performance Indicators (Level 3)	Score	Weight
					specifications has been well served.		
		Responsiveness	0,126	RRE1	The company (seller) is willing to replace products that do not meet specifications.	53	1
		Cost/ Economy	0.079	RC1	The cost of returning products that do not meet specifications is affordable.	56	1
		Sustainability					
		Social	0,088	RS1	Ensure that the product return process is carried out with consumer comfort and satisfaction in mind.	50	1
		Environment	0,179	RE1	Reducing the environmental impact of the product return process	55	0,5
				RE2	Managing waste generated from returned products	53	0,5

Table 10: Final KPI Scores

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Plan	Reliability	PR1	49	0,25	12,25	49
		PR2	50	0,25	12,5	
		PR3	46	0,25	11,5	
		PR4	51	0,25	12,75	
	Responsiveness	PRE1	60	0,5	30	58,5
		PRE2	57	0,5	28,5	
	Cost/ Economy	PC1	55	1	55	55
	Assets	PA1	55	1	55	55
	Sustainability					
	Social	PS1	51	0,333	17	54
		PS2	53	0,333	17,666	
		PS3	58	0,333	19,333	
	Environment	PE1	53	0,5	26,5	53,5
		PE2	54	0,5	27	

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Source	Reliability	SR1	49	0,25	12,25	53,75
		SR2	57	0,25	14,25	
		SR3	64	0,25	16	
		SR4	45	0,25	11,25	
	Responsiveness	SRE1	53	0,5	26,5	56,5
		SRE2	60	0,5	30	
	Cost/ Economy	SC1	42	0,5	21	46,5
		SC2	51	0,5	25,5	
	Sustainability					
	Social	SS1	41	1	41	41
	Environment	SE1	59	1	59	59
Make	Reliability	MR1	47	0,166	7,833	56,166
		MR2	54	0,166	9	
		MR3	64	0,166	10,666	
		MR4	59	0,166	9,833	
		MR5	56	0,166	9,333	
		MR6	57	0,166	9,5	
	Responsiveness	MRE1	56	0,5	28	53
		MRE2	50	0,5	25	
	Cost/ Economy	MC1	36	0,5	18	40
		MC2	44	0,5	22	
	Assets	MA1	53	1	53	53
	Sustainability					
	Social	MS1	50	0,5	25	53,5
		MS2	57	0,5	28,5	
	Environment	ME1	48	0,5	24	50,5
		ME2	53	0,5	26,5	
Deliver	Reliability	DR1	50	0,5	25	50,5
		DR2	51	0,5	25,5	
	Responsiveness	DRE1	57	1	57	57
	Cost/ Economy	DC1	61	1	61	61
	Sustainability					
	Social	DS1	52	1	52	52
	Environment	DE1	56	0,5	28	52,5
		DE2	49	0,5	24,5	
Return	Reliability	RR1	60	1	60	60
	Responsiveness	RRE1	53	1	53	53
	Cost/ Economy	RC1	56	1	56	56
	Sustainability					
	Social	RS1	50	1	50	50

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Business Process (Level 1)	Indicators (Level 2)	KPI	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
	Environment	RE1	55	0,5	27,5	54
		RE2	53	0,5	26,5	

Table 11: Final Values of the Indicators

Business Process (Level 1)	Indicators (Level 2)	Score	Weight	Performance Value (Score x Weight)	Total of Each Indicator
Plan	Reliability	49	0,185	9,050	53,600
	Responsiveness	58,5	0,023	1,339	
	Cost/ Economy	55	0,166	9,108	
	Assets	55	0,313	17,204	
	Social	54	0,189	10,222	
	Environment	53,5	0,125	6,676	
Source	Reliability	53,75	0,162	8,696	49,916
	Responsiveness	56,5	0,137	7,751	
	Cost/ Economy	46,5	0,151	7,012	
	Social	41	0,334	13,69	
	Environment	59	0,216	12,761	
Make	Reliability	56,17	0,13	7,307	51,762
	Responsiveness	53	0,124	6,550	
	Cost/ Economy	40	0,104	4,148	
	Assets	53	0,323	17,108	
	Social	53,5	0,166	8,886	
	Environment	50,5	0,154	7,761	
Deliver	Reliability	50,5	0,366	18,462	52,561
	Responsiveness	57	0,101	5,757	
	Cost/ Economy	61	0,046	2,830	
	Social	52	0,112	5,818	
	Environment	52,5	0,375	19,692	
Return	Reliability	60	0,355	21,276	55,590
	Responsiveness	53	0,182	9,630	
	Cost/ Economy	56	0,079	4,424	
	Social	50	0,127	6,35	
	Environment	54	0,258	13,910	

Table 12: Total Value of Seller Supply Chain Performance

Business Process (Level 1)	Score	Weight	Performance Value (Score x Weight)
Plan	53,6	0,454	24,340
Source	49,92	0,103	5,151
Make	51,76	0,176	9,120
Deliver	52,56	0,134	7,043
Retrun	55,59	0,133	7,365
Total			**53,021**

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

4. Importance Performance Analysis (IPA) Diagram

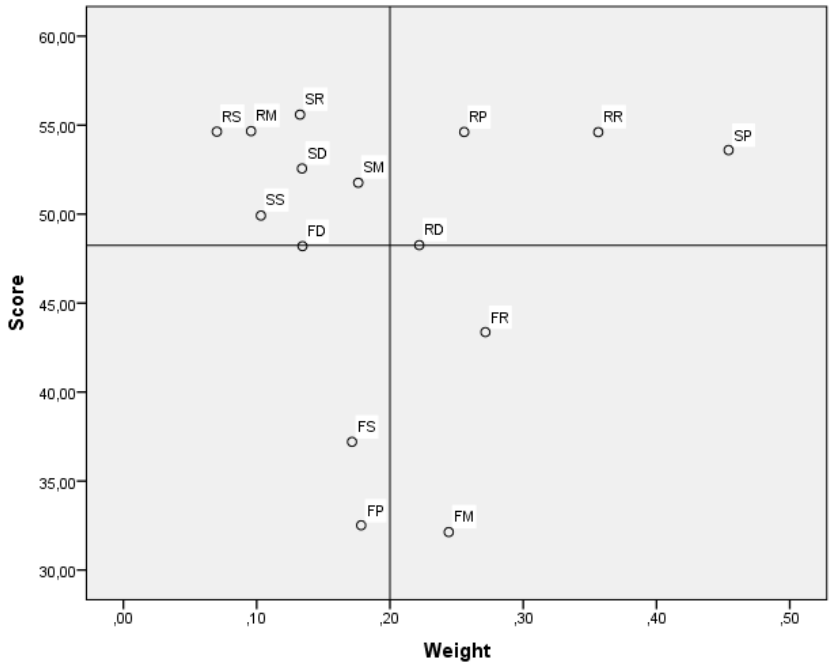

Figure 2: IPA Diagram

Table 13: Code's Business Process (Level 1)

Business Process (Level 1)	Code	Business Process (Level 1)	Code	Business Process (Level 1)	Code
Farmer Plan	FP	Rice Mill Plan	RP	Seller Plan	SP
Farmer Source	FS	Rice Mill Source	RS	Seller Source	SS
Farmer Make	**FM**	Rice Mill Make	RM	Seller Make	SM
Farmer Deliver	FD	Rice Mill Deliver	RD	Seller Deliver	SD
Farmer Return	**FR**	Rice Mill Return	RR	Seller Return	SR

5. Suggested Improvements

The IPA diagram above shows that the level 1 attributes, namely Farmer Make and Farmer Return, are a priority for improvement. Some suggestions for improvements that can be made are:

a. Farmer Make (FM)
   i. Switch to using IoT technology to monitor planting schedules and know environmental conditions in real time
   ii. Use of Just-in-Time (JIT) technology for raw material monitoring
   iii. Conduct strict Quality Control to check product quality
   iv. Use of technology for product packaging
   v. Use of Demand Forecasting technology to respond quickly to consumer demand
   vi. Performing production process optimization
   vii. Use of ERP technology to monitor and manage stock efficiently
   viii. Implementing work standards such as ILO and also ISO 45001
   ix. Use of environmentally friendly waste processing technology
   x. Use of energy-efficient, environmentally friendly certified equipment

b. Farmer Return (FR)
   i. Implement SOP to handle return process (return time, cost responsibility, return reason, etc.)

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

ii. Evaluate the root cause of returns and stock replacement products.
iii. Use of technology to facilitate the return process
iv. Optimize returned products such as donating or recycling.

CONCLUSION

Based on the research that has been conducted regarding the Analysis of sustainable rice supply chains in the Sidenreng Rappang Regency area using the Supply Chain Operations Reference (SCOR), the results obtained are:

a. SCOR value of farmers is below the average of 38.28 so that the performance indicator is included in the poor category.
b. Rice Mills has a SCOR value of 53.19 so that its performance indicator is included in the average category. The SCOR value of rice mills is also the highest among the three.
c. Seller has a SCOR value of 53.02 so that the performance indicator position is in the average category.
d. Level 1 attributes, namely Farmer Make (FM) and Farmer Return (FR), are the priority for improvement.

REFERENCES

1. Ahmad Irfan Nurmahdy, M. d. (Mei 2020). KINERJA RANTAI PASOK BERAS DI KABUPATEN KARAWANG. *Jurnal Aplikasi Manajemen dan Bisnis, Vol. 6 No. 2*, 325-334.
2. Aksal Mursalata, B. H. (2022). Analisis Pendapatan dan Margin Pemasaran Dalam Saluran Distribusi Beras Kabupaten Sidenreng Rappang. *Jurnal Agribisnis Lahan Kering*, 70-76.
3. Anwar, A. K. (2020). KAJIAN VALUE CO-CREATION SEBAGAI STRATEGI PENGEMBANGAN PRODUK KELOMPOK USAHA BERSAMA ZOCHA GARUT MENGGUNAKAN MODEL THE DART.
4. Defrizal, L. H. (7 August 2020). Analysis of Rice Supply Chain Performance Using the Supply Chain Operation Reference (SCOR) Model and Analytical Hierarchy Process (AHP) Method (Case Study: CV. Meutuah Baro Kuta Baro Aceh Besar District). *International Journal of Multicultural and Multireligious Understanding (IJMMU)*, 222-232.
5. Faridz Adi Nurmansyah, R. A. (Maret 2022). ANALISIS MANAJEMEN RANTAI PASOK BERAS DENGAN PENDEKATAN SCOR MODEL. *Jurnal Agrimanex Vol.2 No.2*, 114-122.
6. Fatimah Zahra, M. T. (2021). PERBAIKAN KINERJA SUPPLY CHAIN DENGAN MENGGUNAKAN METODE SUPPLY CHAIN OPERATION REFERENCE (SCOR) (Studi Kasus CV. Athaya Mineral Desa Geudubang Aceh Kecamatan Langsa Baro Kota Langsa). *Jurnal Industri Samudra Vol.2 No.1 ISSN 2797-7730*, 21-33.
7. Husnul Firdaus, D. M. (2020). PENGUKURAN KINERJA SUPPLY CHAIN PERUM BULOG DIVISI REGIONAL KALIMANTAN BARAT MENGGUNAKAN SUPPLY CHAIN OPERATION REFERENCE (SCOR). *Jurnal Komputer dan Aplikasi Volume 8, No. 03*, 19-28.
8. Ma. Patricia Aiyn S. Ortañez, R. D. (t.thn.). Food Supply Chain Optimization Modelling in the Rice Crop Post Harvesting in the Philippines: An Agroecological Approach in Food Sustainability . 2715-2725.
9. Nee, A. Y. (2008). SUPPLY CHAIN MODEL FOR RICE IN MALAYSIA BASICS AND CHALLENGES. *ECER Regional Conference*.
10. Pradeka Brilyan Purwandoko, K. B. (Desember 2018). Analisis Rantai Pasok Beras Organik di Provinsi Jawa Barat Analysis of Organic Rice Supply Chain in West Java Province . *PANGAN, Vol. 27 No. 3*, 187-194.
11. Rachman Jaya, Y. (Januari 2021). Review Manajemen Rantai Pasok Produk Pertanian Berkelanjutan: Konseptual, Isu Terkini, dan Penelitian Mendatang. *Jurnal Ilmu Pertanian Indonesia (JIPI)*, 78-91.
12. Rahmat Prasetya, T. P. (Mei 2018). PENGUATAN KELEMBAGAAN TANI MELALUI IMPLEMENTASI VALUE CO-CREATION ANTARA PETANI DAN BANDAR PADA RANTAI PASOK SAYURAN DATARAN TINGGI DI JAWA BARAT (Suatu Kasus Di Kecamatan Ciwidey, Kabupaten Bandung). *Jurnal Penyuluhan Pertanian Vol 13 No. 1*, 9-19.
13. Tisna Umaran, T. P. (2022). Co-Creation Approach in Designing a Sustainable Coffee Supply Chain (a Case in Bandung Regency, West Java, Indonesia). *MDPI, Sustainability*, 14.
14. TOMY PERDANA, Y. H. (2020). A Conceptual Model of Smart Supply Chain for Managing Rice Industry. *MIMBAR Vol. 36 No. 1*, 128-138.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-72, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

15. Vishal Sharma, D. S. (March 2013). SUPPLY CHAIN MANAGEMENT OF RICE IN INDIA: A RICE PROCESSING COMPANY'S PERSPECTIVE. *International Journal of Managing Value and Supply Chains (IJMVSC) Vol. 4, No. 1*, 25-36.
16. Wawan K. Tolinggi, D. S. (2023). Farmer regeneration and knowledge co-creation in the sustainability of coconut agribusiness in Gorontalo, Indonesia. *Open Agriculture, DE GRUYTER*.
17. Yuli Purbaningsih, B. S. (2021). Rantai Pasok Usaha Penggilingan Padi Studi Kasus : UD. Putra Tunggal Kabupaten Kolaka Timur. *Jurnal Agribisnis Lahan Kering*, 163-173.