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Structural Model for Sustainable Management of Ruminant-Cattle Slaughterhouse (RC-S): The Establishment and Renovation of RC-S

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Abstract: The objective of this research is to identify necessary elements,determinethe hierarchical and contextual relationships between elements influencingin the Establishment and Renovation Program of Ruminant-Cattle Slaughterhouse to support the previous study aiming to formulate strategy in providing food-made from livestock which should be obligatory mandated in the administration of agricultural affairs. The formulation of strategy and program considers variables of sustainable management of Ruminant-Cattle Slaughterhouse service, i.e.: (1) water availability, (2) cattle healthy, (3) willingness to conduct hygiene and sanitation at business scale level, (4) business orientation, (5) cattle availability, (6) slaughtering schedule management, (7) worker safety and security, (8) incompliance of facilities utilization by managers and service users, (9) less compliance of building frame construction with the standard, (10) processing technology. In conclusion that the key goal of the structural model is to increase the quantity of food-made from livestock which comply with safe-health-pure-halalcriteria where Ruminant-Cattle Slaughterhouse editor institution involved. The key possible change is that the accommodated cattle are slaughtered in Ruminant-Cattle Slaughterhouse with halal slaughtering method. Food-made livestockquality improvement was the benchmark of the key element. The key constraint is incompliance of Ruminant-Cattle Slaughterhouselocation with the Detail Land Use Plan.

Key words: Ruminant-CattleSlaughterhouse · Sustainable Management · Structural model · Interpretative Structural Modeling

INTRODUCTION

The approach adopted to formulate strategic plan of the Directorate General of Livestock and Animal Health in carrying out development task is through regional approach which refers to the Master Plan for the Acceleration and Expansion of Indonesian Economic Development 2011-2025. In the document explanation, one of the breakthrough efforts in 2014 is the development of modern Ruminant-Cattle Slaughterhouse(RC-R)as a means of community service in providing healthy meat. Thus, strategy had been formulated in the previous study i.e. service in providing food-made from livestock in accordance with Safe-Health-Pure-Halal (SHPH) standard is obligatory mandated in in the administration of agricultural affairs which supported by the establishment and renovation of RC-S. The locations are focused in livestock and crop integrated area, i.e. Sumatera, Kalimantan and Maluku-Papua corridor as well as densely populated area i.e. Java, Sulawesi and Bali-Nusa Tenggara. However, the existence of RC-R in densely populated area usually creates complex problem either in environment, economic, social, regulation and technology aspect.

In term of environmental and social aspects, problem occurs due to environment sanitary and animal existence may spread disease agent and vector which dangerous to workers safety and security as well as society health in the vicinity area. In term of economical aspect, losses due to prevalence disease of *Bovine*

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Table 1: Profile of Ruminant-Cattle Slaughterhouse in Indonesia

Attribute	Number	Ideal Condition	
Physical condition:	a. RC-SP (unit)		No more cattle slaughtering in Ruminant Cattle-Slaughterhouse Place
	b. RC-S (unit):	273 (39,4%)	(RC-SP)All RC-S is VCN certified, at least RC-S is pre-VCN certified
	• Less (unit)	420 (60,6%)226 (53,8 %)	which valid up to 5 years
	• Moderate (unit)	143 (34,1 %)	
	• Good (unit)	51 (12,1%)	
RC-Scategory:	a. I (unit)	406 (66,7%)	• Meat is distributed in chilled/frozen form in accordance with cold chain concept
	b. II (unit)	14 (33,3%)	• RC-Scategory II exists in center area of cattle and consumer
HR RC-S and RC-SP:			Every RC-S has at least:
	a. Veterinarian PJT (people)	225*	• Veterinarian PJT: 1 people
	b. Paramedic (people)	546*	• Paramedic roles as meat checker: 4 people
	c. Halal slaughter expert:	811*	• Halal slaughter expert:2 people
	• certified	479*	
	• not certified		

Remark: (*) un-even distribution at each RC-S and RC-SP

*Hydatidosis, Metacestodes, Sarcosporidiosis*in cattle causes the body weight reduced by fivepercents and the quality of organ and carcass is rejected [1-4]. Zoonotic *Query (Q)* fever disease in cattle caused by *Coxiellaburnetti*which spread all over the world also found in RC-S, Bogor Regency [5]. In 2012, 81% of 845 units of RC-S in Indonesia were forced to close due to incompliance to hygiene and sanitary standard [6]. In 2014, as many as 152 units of RC-S were closed bringing to only 693 units of RC-S operate in Indonesia and 25 units were Veterinary Control Number(VCN) certified (Table 1).

The objective of this research is to identify necessary elements and determine the hierarchical and contextual relationships between elements influencing in the Establishment and Renovation Program of RC-S, to support the previous study aiming to formulate strategy in providing food-made from livestock which should be obligatory mandated in the administration of agricultural affairs.

Methodology

Data Collection: This research takes place during February to March 2014 and is carried out in RC-S located in the Regency and Municipality of Bogor, Surabaya and Malang. Whole activity of management is collected in form of primary and secondary data, including: (1) employment relationship, (2) feedback, (3) coordination, (4) cooperation, (5) communication, (6) method, (7) way of work, (8) system, (9) technique, (10) working procedure and (11) structure. Data is collected through studi literature, workshop, focus group discussion and expert opinion in order to review the management of RC-S so far. A principle of mutual cooperation, implement the participatory decision and achieving best goal through holistic vision is the pre-requisite of the administration function. *Interpretative Structural Modeling* (ISM) method is applied in order to generate structural modeling, predict and capture complex problem to formulate decision based on inter-relationship among different criteria [7-9].

Program Structuralanalysis: The establishment of RC-S referred to re-establishment of RC-S which is considered to be not feasible in term of structural strength or design or new establishment of RC-S as the older RC-S is no longer comply with the detail of regional spatial planning. Renovation is carried out to improve the status of Ruminant-Cattle Slaughter Place (RC-SP) owned by local government to be Ruminant-Cattle Slaughterhouse (RC-S) owned by local government which havenot met technical requirement. Therefore, program structure to generate strategy should be developed using ISM. This method is able to identify internal and external barrier factors and generates output based on structural analysis as well as to construct inter-relationship among specific items which define a problem or issue [10-16]. ISM technique is a group learning process thus can give valuable meaning for the community in meeting their present and future needs [17]. Three items produced by ISM are: (1) key element, (2) elementary hierarchy structure and (3) grouping elements into four classification sectors.The first sector is independent (herein called sector I), the second sector is linkage (herein called sector II), the third sector is dependent (herein called sector III) andthe fourth sector is autonomous (herein called sector IV). Independent classification has a strongdriving force and less dependence.Linkage classification has unstable inter-relations among variables and every

Table 2: Contextual relationship among elements of the model

No	Element	Contextual relationship
1	The objective of effective establishment and renovation program of RC-S	G^i roles to support G^j
2	Possible change	M^icauses M^j
3	Benchmarks for assessing each program's goal	T^i affects T^j
4	Main constraint	K^i causes K^j
5	Agencies involved	L^i roles to support L^j

Table 3: The value of R^2, stress, MDS and Monte Carloanalysis

Dimension	R^2	Stress	MDS result	MonteCarlo result	Difference
Ecological	0,950	0,213	53,110	52,745	0,365
Economic	0,954	0,218	54,172	54,115	0,057
Social	0,958	0,212	54,618	54,486	0,132
Regulation	0,930	0,214	46,486	46,158	0,328
Technological	0,956	0,130	30,370	30,081	0,289

action of each variable will give impact to other sub-elements. The feedback of this sub-element may give greater impact thus it should be well defined. Dependent classification has a strong driving force and dependence. Autonomous classification is a sub-element which are not directly related to the system, have small correlation but may have stronger impact in achieving the goal [18].According to [19], program can be developed into nine elements, namely: (1) society sector who are affected by the program, (2) program needs, (3) main constraint of the program, (4) possible changes in the program, (5) the goal of the program, (6) benchmarks for assessing each program's goal, (7) activities needed to plan action, (8) the size of the activity in order to evaluate the results achieved by each activity and (9) agencies involved in the implementation of the program. According to those concepts, the establishment and renovation of RC-S is based on five elements, namely: (1) the goal of the program, (2) possible changes in the program, (3) benchmarks for assessing each program's goal, (4) main constraint of the program and (5)agencies involved in the implementation of the program. Based on literature study, expert, practitioner opinion as well as perception observation of RC-S managers, sub-elements of five elements are identified (Table 2).

Table 2 represents the expert assessment on contextual relationship among sub-elements was denoted in V (performance measure i will help alleviates performance measure j), A (performance measure j will be alleviated by performance measure i), X (performance measure i and j will help each other) and O (performance measure i and j are unrelated). Structural self interaction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix. The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived [20-23].

The priority strategy as resulted from last research is that the service in providing food-made from livestock should be obligatory mandated in the administration of agricultural affairs which supported by The Establishment and Renovation of RC-S. The method of statistical analysis used are Multi Dimensional Scaling (MDS), Monte Carlo and Analytical Hierarchy Process (AHP). There were important variables found in MDS, i.e.: water availability and cattle healthy status (ecological dimension), willingness to conduct hygiene and sanitation at business scale level, business orientation, cattle availability and slaughtering schedule management (economic dimension), worker safety and security (social dimension), incompliance of facilities utilization by managers, workers and service users, less compliance of building frame construction with the standard (regulation dimension) and processing technology (technological dimension). Validation of rap-slaughterhouse simulation for five dimensions is shown in Table 3. The determinant coefficient (R^2) is good i.e. higher than 0,90. This value indicates that attributes involved in this model shows good performance in representing variance of those five dimensions. High S stress value of five dimensions represents good model.

Besides, the difference resulted from MDS and Monte Carlo analysis is relatively small (<1) shows that value obtained from MDS can represent the real value with high precision. Random error evaluation is performed by using Monte Carlo analysis which objected to determine (1) the effect of error in determining score of each attribute, (2) the effect of variance in determining score of each attribute, (3) stability of repetitive MDS analysis process,

Table 4: Multidimensional sustainability index

Dimension	Dimension weight (%)	Index value	Index value of weighing result
Ecological	0,06	53,11	3,19
Economic	0,05	54,17	2,71
Social	0,05	54,62	2,73
Regulation	0,30	46,86	14,06
Technological	0,54	30,37	16,40
Total	100(inconsistency 0,03)	39,06	

The result shows not sustainable status (39,06).

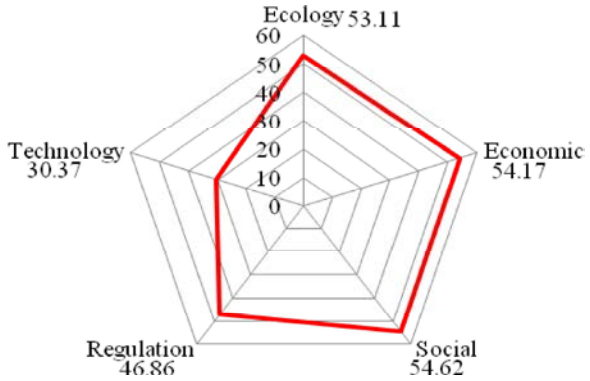

Fig. 1: Kite diagram of sustainability status of RCS business service management

(4) the effect of missing data and (5) stress value. Figure 1 shows kite diagram which represents the index value of five dimensions which used as indicators to assess the sustainability status of RCS business service management.

Pairwise comparison test which obtained from expert judgment results balanced score as shown in Table 4.

RESULT AND DISCUSSION

ISM can provide very good condition to structurize diversity and different views dealing with a very complex problem. System elements are presented in a graphical figure of every inter-relationship item where the hierarchy level is able to identify the relationship among ideas and determinant structures of a complex problem. Based on the concept, the elements and sub-elements of the program used in this research areexplained below.

Goal Element: Program goal element consists of ten sub-elements, namely: (1) design and layout of machines and facilities in accordance with halal principal (G1), (2) improve the slaughtering method (G2), (3) improve the natural resource recovery (G3), (4) control CO_2 amount released into the air (G4), (5) train workers to comply with hygiene and sanitary standard (G5), (6) develop business climate (G6), (7) build the infrastructure for water storage and discharge (G7), (8) increase the social networking value (G8), (9) increase slaughtering number (G9) and (10) increase food-made from livestockquality based onsafe-health-pure-halal(SHPH) criteria (G10). Expert assessment on contextual relationship among sub-elements was denoted in V, A, X and O symbol.Structural selfinteraction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix. The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived. Contextual relationship among the sub-elements shows its role in supporting the program. Based on the classification of sub-elements illustrated in Figure 2, the key sub-element is to increase the quality of food-made from livestock based on SHPH criteria (G10). This sub-element has strong driver power on the success of the program. Standards compliance is a key area affecting competitive performance of RC-S and has implications for both global and domestic markets. Interpretative Structural Modeling (ISM) of critical enabling elements for meat standards compliance in a developing country's RC-S is shown in Figure 2. Specific cases from Indonesia conditions have been used throughout the study.

This sub-element is less dependence on the program, thus failure of the program may not have direct impact. Sub-element of design and layout of machines and facilities in accordance with halal principal (G1), improve the slaughtering method (G2), control CO_2 amount released into the air (G4), (5) train workers to comply with hygiene and sanitary standard (G5), (6) develop business climate (G6) and increase the social networking value (G8), include in linkage classification. Based on element classification analysis, dependent variables which not influenced by other sub-elements are also found. Sub-elements that include in dependent variables are increase slaughtering number (G9), build the infrastructure for water storage and discharge (G7) and

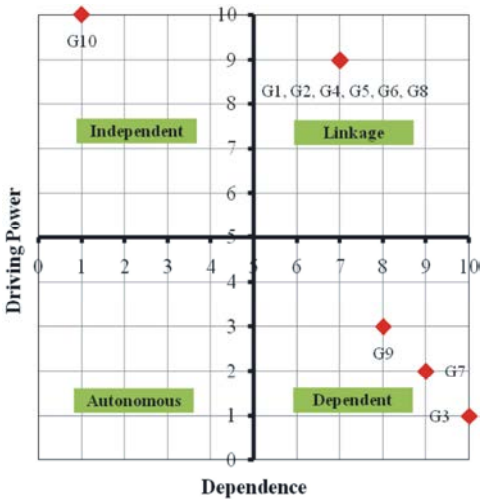

Fig. 2: Driver power-dependence matrix of the goal of the stablishment andrenovationof RC-S

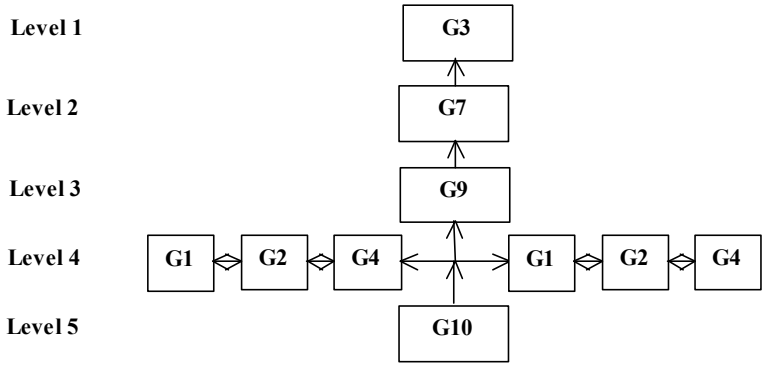

Fig. 3: Structural model diagram of the goal establishment andrenovationof RC-S program

improve the natural resource recovery (G3), this element showed maximum dependence.The practical application of element G3 is recognized. However, these sub-elements are dependent variables which will influence the food-made from livestockquality. The interest level of goals element is illustrated in Figure 3. Proper infrastructure of water storage and discharge make the hygiene and sanitary implementation runs smoothly [24]. Improving the technology of slaughtering method will meethalal criteria requirement and provide fair business service either for RC-S under the management of central government or local private institution. Therefore, those elements also support the increasing quality of food-made from livestockbased on SHPH criteria.

In order to achieve the increasing quality of food-made from livestockbased on SHPH criteria, it roles to support: (1) design and layout of machines and facilities in accordance with halal principal, (2) improve the slaughtering method, (4) control CO_2 amount released into the air, (5) train workers to comply with hygiene and sanitary standard, (6) develop business climate and (8) increase the social networking value. Those six goals role to support increase slaughtering number.Thereafter, build the infrastructure for water storage and discharge of slaughtering service provider either managed by government or local government can be fair enough and the improvement of improve the natural resource recovery can increase the quality of food-made from livestock.

Possible Changes: Possible change elements consist of ten sub-elements, namely: (1) offer comfort feeling in consuming food-made from livestock (M1), (2) achieve the agreement on Good Manufacture Practise(GMP) or at least hygiene and sanitary standard (M2),(3) achieve the agreement on microorganism number standard of meat and carcass either in fresh or frozen form (M3), (4) achieve the agreement on halal slaughtering method either for local or import cattle (M4),(5) community learning to understand that RC-S is used for producing food-made from livestock (M5), (6) improve responsibility for RC-S

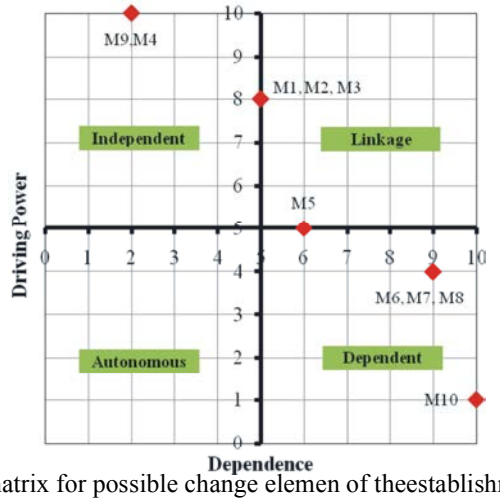

Fig. 4: Driver power-dependence matrix for possible change elemen of theestablishment andrenovationof RC-S

owning VCN certification (M6), (7) improve administration functions (working relation, feedback, coordination, cooperation, communication, method, way of working, system, technique, work procedure and structure) (M7), (8) risk analysis implementation of cattle health status (M8),(9) all cattle stayed in RC-S is slaughtered in RC-S (M9)and (10) maintain the building site (M10).Expert assessment on contextual relationship among sub-elements was denoted in V, A, X and O symbol.Structural self-interaction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix.The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived. Contextual relationship among the sub-elements shows its causes the program. Based on the illustration in Figure 4, it can be found that independent sector consists of all cattle stayed in RC-S is slaughtered in RC-S (M9), achieve the agreement on halal slaughtering method either for local or import cattle (M4), offer comfort feeling in consuming food-made from livestock (M1), (2) achieve the agreement on GMP or at least hygiene and sanitary standard (M2),(3) achieve the agreement on microorganism number standard of meat and carcass either in fresh or frozen form (M3). Result shows that all cattle stayed in RC-S is slaughtered under halal method has the strongest driver power, thus two sub-elements are the key sub-element. Quality and performance of global food-made from animal business today is heavily influenced by standards and regulatory regimes. It is dependent on national policy frameworks of governments, quality and safety regulatory systems, compliance to rules and standards etc. While a regulatory framework commands automatic compliance, systems in developing countries have shown lapses. Although their export channels display certain amount of orientation towards compliance, domestic channels lag behind. The challenge to maintain safety and quality is high, as it has grave implications for global food-made from livestock trade. Food standard compliance, thus has become, one of the most debated and indulged topics in world trade forums [25].

Whereas, dependent sector consists of community learning to understand that RC-S is used for producing food-made from animal (M5), improve responsibility for RC-S owning VCN certification (M6), (7) improve administration functions (working relation, feedback, coordination, cooperation, communication, method, way of working, system, technique, work procedure and structure) (M7) and (8) risk analysis implementation of cattle health status (M8). Figure 4 shows the hierarchy of possible change element.

Based on the hierarchy level and dependence relation, it shows the importance change of cattle to be slaughtered under halal method. This condition may influence offer the comfortability of society to consume food-made from livestockdue to the implementation of GMP or at least hygiene and sanitary and assurance of meat and carcass either in fresh or frozen quality. This condition also influences of community learning to understand that RC-S is used for producing food-made from livestockbased on SHPH criteria. All this condition results in implementation of improve responsibility for RC-S owning VCN certification, improve administration functions (working relation, feedback, coordination, cooperation, communication, method, way of working,

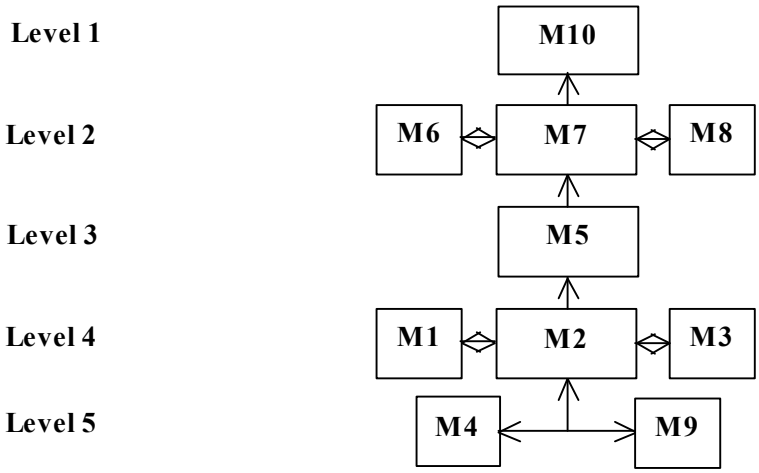

Fig. 5: Structural model diagram of possible change theestablishmentandrenovationof RC-S

system, technique, work procedure and structure) and risk analysis implementation of cattle health status as the basic procedure to possess VCN certification and may improve the administration function that makes RC-S building and site sustain.The highly prohibitive GMP and VCN certification costs are a deterrent for developing country firms to adopt certification processes.EurepGMP (European Retailer Parties' Good Manufacture Practices)–now re-christened GLOBALGMP–the most commonly implemented certification system has proved to be expensive for average medium small scaleRC-S producers. To counter this practice, developing countries are preparing their own domestic standards of GMP and VCN and benchmarking it with EurepGMP and similar standards. This reduces costs and establishes a customized certification system for domestic sector. Exercising control over primary production systems means a methodical keeping of culture calendars spray schedules, etc. at farm level. Tracking food from the field can reduce contaminants like microbiological, chemical and pesticide residues. Implementation of Exercising control over primary production systems is a strategic intervention to gain control over primary production processes. It is currently restricted in most developing countries to only farms producing for exports. Duplication of regulations and its administration are constantly highlighted issues in developing countries, Indonesia being an apt example of this situation. Objective of the new food law – Food Safety and Standards Act, 2006 – is to unify the system and consolidate fragmented institutional structures. GMP and Hazard Analysis and Critical Control Points (HACCP) and similar manufacturing certifications require coordinated controls and determination of all institutional partners in government.

Benchmark Element to Measure Each Goal: Benchmark element to measure each goal consists of ten sub-elements, namely: (1) increasing the quality of hygiene and sanitary stage and process [T1],(2) increasing the production number of food-made from livestock(meat and skin) [T2], (3) increasing the efficiency of time required in slaughtering process [T3], (4) increasing the knowledge and attitude both for workers and managers in the implementation of hygiene and sanitary [T4], (5) increasing the maintenance and capacity of liquid and solid waste storage [T5],(6) reducing the amount of CO_2 released into the air [T6],(7) increasing the efficiency of energy consumption[T7], (8) increasing the number of RC-S service user [T8], (9) increasing the profit of RC-S business [T9]and (10) availability of standard room at the main building and supporting room as well as the facilities [T10].However, benchmark to measure the success of implementation is not well defined yet. Benchmarks used to measure each objective must be able to demonstrate a real contribution to improving the efficiency and effectiveness of RC-S business management services in sustainable manner.Expert assessment on contextual relationship among sub-elements was denoted in V, A, X and O symbol.Structural self-interaction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix.The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived. Contextual relationship among the sub-elements shows its affectsthe program.

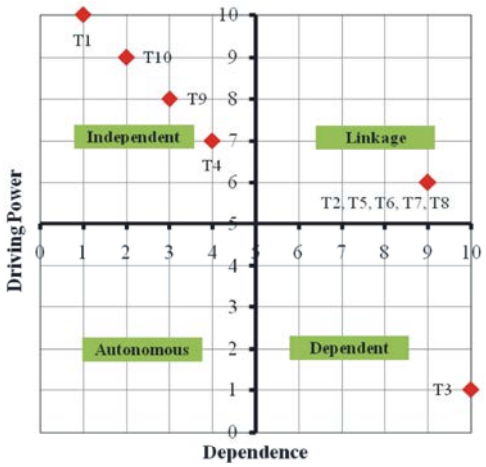

Fig. 6: Driver power-dependence matrix for benchmark element

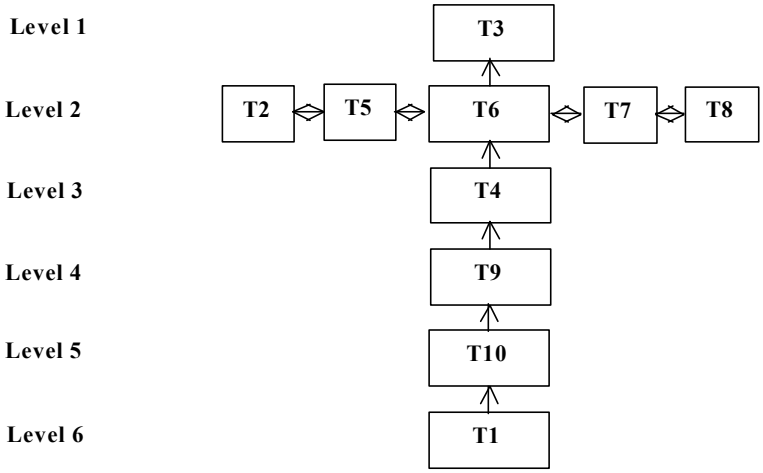

Fig. 7: Structure model diagram of benchmark element theestablishment andrenovationof RC-S

In accordance with the contextual relationship among elements, the result shows that the increasing quality of hygiene and sanitary stage and process has the strongest driver power thus it is called as the key sub-element. Based on the analysis as illustrated in Figure 6, it shows that the increasing quality of hygiene and sanitary stage and process (T1), room number at the building (T10), increasing profit (T9) and increasing skills to implement hygiene and sanitary(T4) belong to independent sector. T10can be the first measure of action towards compliance. Fixing accountability in managerial (officer) cadres will enable responsive and timely action leading to realistic monitoring of institutional set ups, preparation and ground work for policy making involving stakeholders at all levels, expeditious but prudent and rationalistic decision making on policy programs and their successful implementation.Whereas, sub-element of increasing the production number of food-made from livestock(T2), increasing the maintenance and capacity of liquid and solid waste storage [T5], reducing the amount of CO_2 released into the air [T6], effectiveness of energy consumption (T7) and increasing number of service users (T8) belong to linkage sector. Effectivenessof slaughtering time belongs to dependent sector which resulted from the activity of sub-elements in linkage and independent sector.

Based on the hierarchy level and dependence relation as illustrated in Figure 7, it shows that the increasing quality of hygiene and sanitary stage and process influences the number of room at the building so that the profit potency and hygiene and sanitary implementation increase. The achievement will impact to the increasing of production number of food-made from livestockwhich considers waste storage capacity, reducing amount of CO_2, effectivenesof energy consumption and increasing number of service users. Those five sub-elements finally influence the effectivenessof slaughtering time.

Main Constraint: The main constraint element consists of ten sub-elements, namely: (1) limited budget [K1], (2) existing RC-S location is not in accordance with the regional spatial planning [K2], (3) difficulties to manage service users during the execution [K3], (4) profit sharing/retribution service is not achieved [K4], (5) concern that legislative council increase profit sharing/retribution service [K5], (6) increasing energy consumption [K6], (7) difficult to change worker behaviour recruited by service user [K7], (8) concern on losing service users [K8], (9) difficulties to find good construction service provider who have competency in RC-S building construction [K9] and (10) the behavior of service user to use traditional slaughtering method [K10].The result (Figure 7) shows that difficulties to manage service user during establishing and renovation (K3), limited budget (K1) and RC-S location is not in accordance with the regional spatial planning or K2 (also as the key sub-element) belong to independent sector. Linkage sector consists of concern if profit sharing/retribution service is not achieved (K4), losing service users (K8) and increasing of retribution fee/profit sharing (K5). Dependent sector consists of difficulties to find good construction service provider who have competency in RC-S building construction (K9) [25], the behavior of service user to use traditional slaughtering method (K10), difficult to change worker behaviour recruited by service user [K7] and increasing energy consumption [K6].Expert assessment on contextual relationship among sub-elements was denoted in V, A, X and O symbol.Structural self-interaction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix.The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived. Contextual relationship among the sub-elements shows its causses the program. Figure 8 shows importance level of main constraint sub-element. Uncertainty of RC-S location leading into a long discussion of budget formulation and difficulties to manage service users during the establishment and renovation.

This leads to retribution fee/sharing profit is not achieved, legislative increases the retribution/sharing profit target and potentially may lose number of service users. Losing the number of service users affects to the difficulty in getting prospective service provider and they may do slaughtering outside of RC-S. This condition

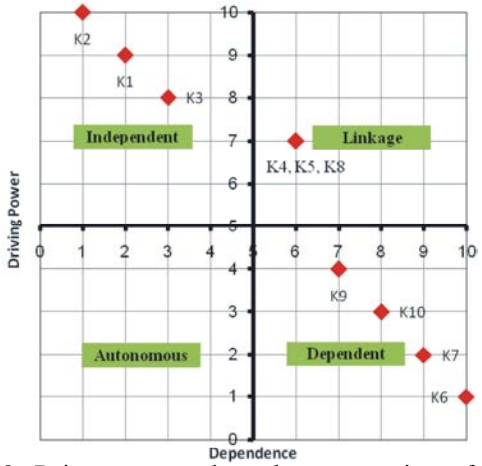

Fig. 8: Driver power-dependence matrix of main constraint theestablishment andrenovationof RC-S

leads to the difficulties in complying with construction requirement, may change service user and worker's behavior, difficult to achieve effectiveness and efficiency of energy consumption in RC-S and leading to serious problem in the development countries including Indonesia [26].

Involved Agencies: Element of involved agencies consists of ten sub-elements, namely: (1) legislative (L1),(2) RC-S auditor (L2),(3) central and provincial government (L3),(4) local society (L4), (5) University (L5), (6) Research and development agency(L6), (7) local government (L7),(8) goods and service provider unit (L8), (9) consultant and contractor service association (L9) and (10) service user community (L10).

Expert assessment on contextual relationship among sub-elements was denoted in V, A, X and O symbol.Structural self-interaction matrix (SSIM) is constructed from respondent perception matrix of each sub-elements and its direct relation among sub-elements. The following step is to construct initial reachability matrix by converting SSIM into 1 and 0 biner matrix. The next step is to revise SSIM according to transitivity method to develop final reachability matrix. From this matrix, dependency level and driver power are derived. Contextual relationship among the sub-elements shows its causses the program.ISM result in Figure (9) shows that RC-S auditor (L2) is the key sub-element as this organization, legislative (L1), local society (L4) and local government (L7) belong to independent sector. Those four sub-elements are independent variables which have strong driver power in supporting the success of the

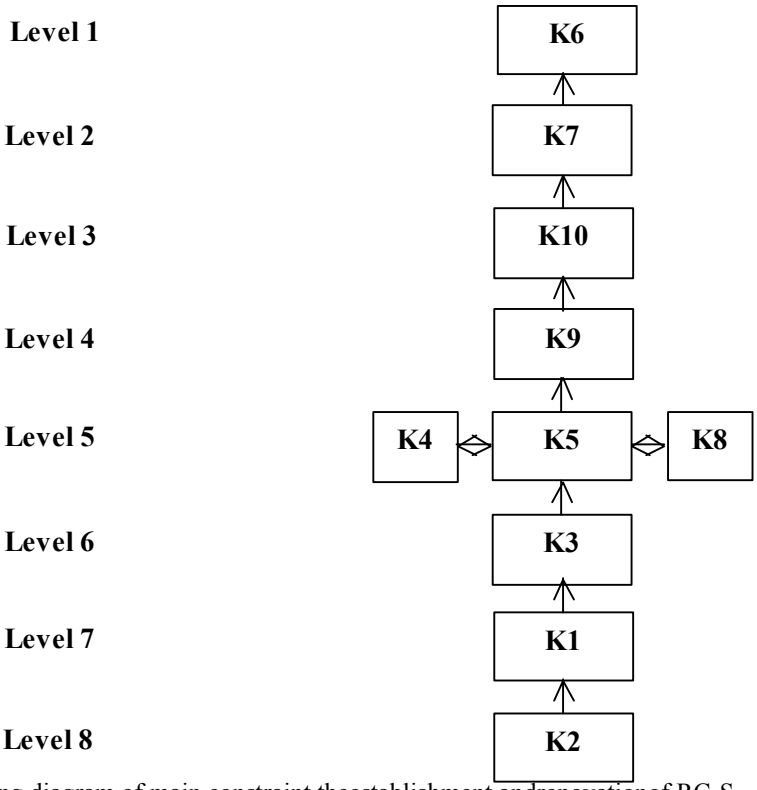

Fig. 8: Structural modeling diagram of main constraint theestablishment andrenovationof RC-S

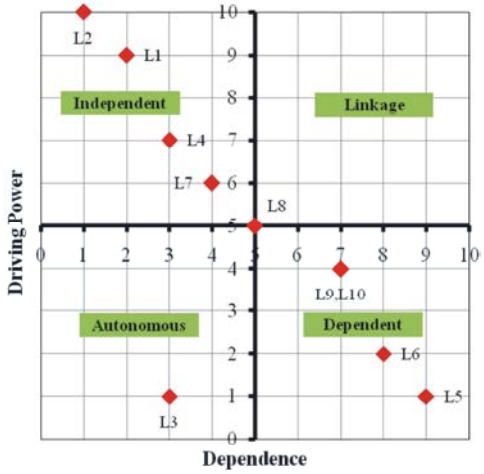

Fig. 9: Driver power-dependence matrix of involved organization theestablishment andrenovationof RC-S

program. In addition, three organizations L1, L4 and L7 are also being supported by RC-S auditor as the working partner in controlling the implementation of the program. RC-S auditor as an organization who have consensus is expected to maintain the sustainability of RC-S business management service. Integrated control may sustain the RC-S business service with better management.

Dependence and affected variables due to activities from other sub-elements are consultant and contractor service association (L9), service user community (L10), Research and development agency(L6) and University (L5). The role of Research and development agencyand University involved in the RC-S business management service supports consultant and contractor service association and service user community in formulating strategy, policy and program through academic study. L5 and L6 sub-elements are critical in standards enforcement and indicates high dependency. This can tap potential of scientific communities and research facilities available in developing countries such as Indonesia. Competitive strengths in knowledge domain possessed by research academia can enhance understanding of standards and their relevance/implications for a produce or product.Goods and service provider unit (L8) and central and provincial government (L3) classified as autonomous sector which not directly related to the system, have a little relationship but may have stronger impact to the success of the program. The role of Good and service provider without knowledge on hygiene and sanitary implementation or cattle health status may become the source of a conflict and cause the goalof establishment and renovation RC-S is not achieved. Another source of

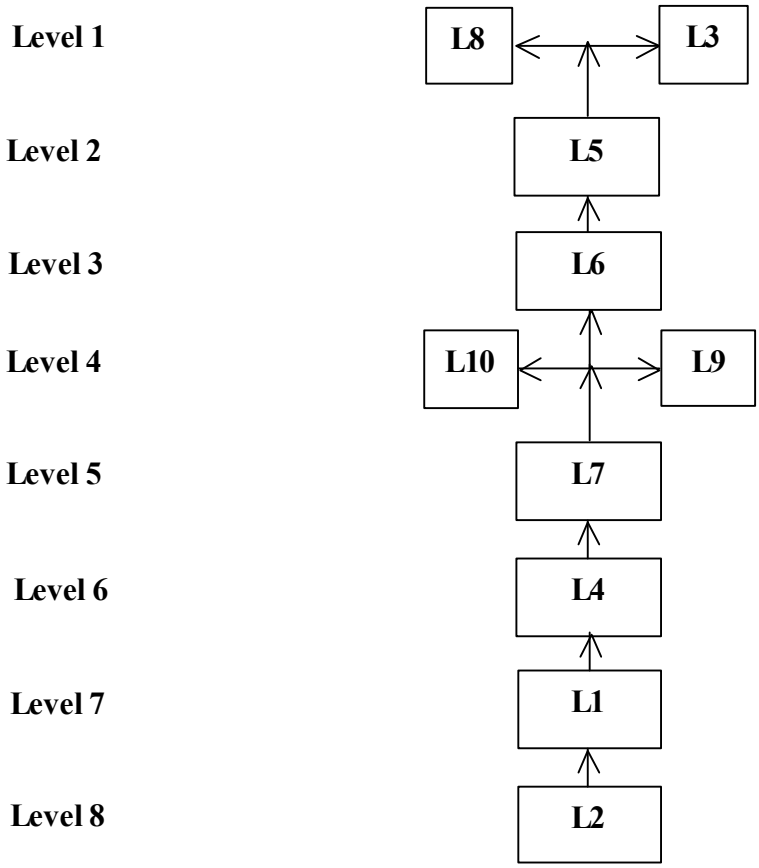

Fig. 10: Structural model diagram of involved organization theestablishment andrenovationof RC-S

conflict can be seen from the strong dynamic occur in the community of service users who sometimes roles as a cattle trader. This can lead to an international issue about animal welfare. Another fact found during research is that service users community may trigger importer to ask government to import beef cattle as the price of import cattle is cheaper, the quality and quantity is more maintained, produces carcass more than fiftypercents so that they can gain higher profit compared to local cattle. However, the indigenous social value from the old generation may have function in social value and preventing conflict [27]. Explanation on the interest hierarchy level of involved organization can be seen in Figure 10.RC-S auditorwho perform RC-S management performance audit, placed at the highest level. His role to support the task and function of Legislative. Audit's finding will become the input for localsociety, local government, consultant and contractor service association and service user community.Research and development agency and University support central and provincial government and goods and service provider unit.

CONCLUSION

In conclusion finds that the key or main element of the structural model is to increase the quantity of food-made from livestock which comply with safe-health-pure-halal criteria where Ruminant Cattle-Slaughterhouse auditor institution involved. Possible change is that the accommodated cattle are slaughtered in Ruminant Cattle-Slaughterhouse with halal slaughtering method. Food-made livestock quality improvement was the benchmark of the key element. The key element constraint is Incompliance of Ruminant Cattle-Slaughterhouse location with the Detail Land Use Plan, it is also considered as uncontrolled input.

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