

## REFERENCES

Central Bank of Sri Lanka. (2011). *Annual Report - National Output and Expenditure*. Colombo: Central Bank of Sri Lanka.

Department for Business, Innovation and Skills. (2010). *Technology and Innovation Futures: UK Growth Opportunities for the 2020s*. London: Department for Business, Innovation and Skills.

Department of Animal Production and Health. (2011). *Annual Report*. Peradeniya: Department of Animal Production and Health.

Dileep, K. (2012). Factors Wavering Internationalizations of SMEs: Indian Context. *Journal of Economics and Behavioral Studies* , 142 - 158.

Goncharuk, A. (2009). How to make meat business more effective A case of Ukraine. *British Food Journal* , 585-597.

Joseph, F. W. (2010). *Multivariate Data Analysis*. Prentice Hall.

Klomklieng, W., Ratanapane, P., Tanchareon, S., & Meesap, K. (2012). Strengthening a Research Cooperation Using a Triple Helix Model: Case Study of Poultry Industry in Thailand. *Procedia - Social and Behavioral Sciences* , 120-129.

Kumarasekara, K. J. (2009). Improving Labour Productivity of Smallholder Dairy Farmers. *Department of Agribusiness Management* , 16-21.

Manning, L. (2008). The impact of water quality and availability on food production. *British Food Journal* , 762-780.

Manning, L., & Baines, R. (2004). Globalisation: A study of the poultry-meat supply chain. *British Food Journal* , 819-836.

Mardikar, S., & Niranjana, K. (1995). Food processing and the environment. *Environmental Management and Health* , 23-26.

Martínez, C. I. (2010). Analysis of energy efficiency development in the German and Colombian food industries. *International Journal of Energy Sector Management* , 113-136.

Mead, G. C. (1990). Food Poisoning Salmonellas in the Poultry-meat Industry. *British Food Journal* , 32-36.

Ngamkroekjoti, C., & Speece, M. (2008). Technology turbulence and environmental scanning in Thai food new product development. *Asia Pacific Journal of Marketing and Logistics* , Vol. 20 Iss: 4 pp. 413 - 432.

Ojo, S. (2005). Analysis of productivity and risk factors in commercial poultry production in Osuan State, Nigeria. *Journal of Food, Agriculture & Environment* , 130-133.

Porter, M. E. (1980). *Competitive Strategy*. New York: The Free Press.

Rodgers, S. (2008). Technological innovation supporting different food production philosophies in the food service sectors. *International Journal of Contemporary Hospitality Management* , 19-34.

Rota, A., & Sperandini, S. (2010, February). Value chains, linking producers to the markets. *International Fund for Agricultural Development* .

Saunders, M. T. (2009). *Research methods for business students*. Harlow: Prentice Hall.

Sekaran, U. (2010). *Research Methods for Business*. West Sussex: Jhon Wiley& Sons Ltd.

Shoreline Service Limited. (2006). *POULTRY SUB SECTOR ANALYSIS REPORT*. Kampala.

Sushil, D. (1990). Waste Management: A Systems Perspective . *Industrial Management & Data Systems* , 1-67.



Wanasinghe, D. D. (2012). Charemen of All Island Poultry Association. (G. Warushamana, Interviewer)

Yadav, S., Sagheer, S., & Deshmukh, S. (2009). Developing a conceptual framework for assessing competitiveness of India's agrifood chain. *International Journal of Emerging Markets* , 137-159.

Yeung, R. M., & Yee, W. M. (2003). Risk Reduction: an Insight from the UK poultry Industry. *Nutrition and Food Science* , 219-229.

# APPENDIX A: RESEARCH QUESTIONNAIRE

FACTORS AFFECTING THE DEVELOPMENT OF MILITARY  
INDUSTRY IN SRI LANKA WITH SPECIAL EMPHASIS ON  
TECHNOLOGY RELATED ISSUES

QUESTIONNAIRE

This questionnaire is designed to collect the views of experts, scholars and  
other persons who are familiar with the current situation in Sri Lanka  
regarding the development of military industry. The study is carried out as a  
part of a research project on the development of military industry in Sri Lanka.

The questionnaire is divided into two parts. Part I contains general information  
about the respondent and the organization. Part II contains the research  
questions.

The questionnaire is to be filled out by the respondent and returned to the  
researcher. The questionnaire is to be filled out in the English language.  
The questionnaire is to be filled out in the English language.

The questionnaire is to be filled out by the respondent and returned to the  
researcher. The questionnaire is to be filled out in the English language.  
The questionnaire is to be filled out in the English language.

Thank you for your cooperation.

Yours faithfully,

Dr. M. S. Jayasinghe

# **CRITICAL FACTORS AFFECTING THE DEVELOPMENT OF POULTRY INDUSTRY IN SRI LANKA WITH SPECIAL EMPHASIS ON TECHNOLOGY RELATED ISSUES**

Dear Participant

This survey questionnaire is designed to identify the **Critical Factors Affecting for the Development of Poultry Industry in Sri Lanka, with the Special Emphasis on Technology Related Issues**. This study is carried out as a partial fulfillment of the Master of Business Administration program conducted by the Department of Management of Technology, University of Moratuwa.

This Questionnaire contains two sections. **Section 1** is to collect general information about the participant and the **Section 2** is to collect participant's responses to the suggested factors through the survey.

All the information collected through the survey will remain confidential and data will be analyzed in unanimous manner and not at individual level. The information collected through this survey will be used for only academic purposes.

It will take approximately 15 to 20 minutes to complete this survey. I sincerely request you to spare few minutes to give your true and honest feedback to the questionnaire and return to the email [LKKAUNADA@GMAIL.COM](mailto:LKKAUNADA@GMAIL.COM)

Thank you in advance for your kind corporation,

**Darshana Karunaratne**

University of Moratuwa.

## Introduction to Process Technology in Poultry Industry.

Poultry farms, mainly chicken farms producing meat and eggs or breeder farms, can be highly specialized operation in today's context. To maximize profits a proper technology management during the operation is required. Proper farm management ensures efficient production and good quality products. This is accomplished by controlling diseases, maintaining feed efficiency, proper handling of waste and proper sanitization of the farm house. Due to this fact, a better understanding of husbandry practices and use of new technologies in the industry plays a major role in the industry success.

### Section 1

Please indicate by  in the most suitable box/boxes indicating your organization

1	Indicate your industry subsector basis current operation			
	Hatchery/Breeder Farm	<input type="checkbox"/>	Broiler Farm	<input type="checkbox"/>
	Layer Farm	<input type="checkbox"/>	Meat Processing/Further Processing	<input type="checkbox"/>
2	Nature of business ownership			
	Local company	<input type="checkbox"/>	Family manage operation	<input type="checkbox"/>
	With foreign partnership	<input type="checkbox"/>	Government/Semi Government	<input type="checkbox"/>
3	Number of Employees			
	Less Than 25	<input type="checkbox"/>	Between 25 to 100	<input type="checkbox"/>
	More Than 100	<input type="checkbox"/>		
4	Operational Capacity in terms of No of Animal			
	Less Than 1,000	<input type="checkbox"/>	Between 1,000 to 10,000	<input type="checkbox"/>
	More Than 10,000	<input type="checkbox"/>		
5	Number of Years in the current industry sector			
	Less Than 1 years	<input type="checkbox"/>	Between 1 to 5 years	<input type="checkbox"/>
	More Than 5 years	<input type="checkbox"/>		

**Section 2**

Please indicate by  in the most suitable response indicating your organization

Question No.	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
<b>Livestock Development strategy executed by Ministry of Livestock Development</b>							
1	Extension programs had helped to improve the technological capabilities of poultry industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ1
2	Effective international technology transfer to poultry industry had improved the operational efficiency of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ2
3	Availability of high quality grandparents had increased the productivity of operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ3
4	Involvement of public sector in poultry value chain through NLDB had helped to identify the technological issues of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ4
5	Availability of efficient service of provincial authorities to industry had helped to meet the compliance requirement in farm operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ5
6	Availability of efficient service of local authorities to industry had helped to improve the animal health conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ6
7	Availability of financing facilities in industry development activates had helped to enhance the technology up gradation in the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ7
8	Availability of farmer protection programs had minimized the risk of investing on technology up gradation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LSDQ8
<b>Research and Development initiatives taken by the Ministry of Technology and Research</b>							
9	Consistence R&D initiatives had helped to improve the animal health and the productivity of the operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TRQ1
10	Optimization of input cost to the poultry feed had improved the productivity of the poultry farm operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TRQ2

11	Availability of feasible technical solutions on efficient energy management and waste management had improved the farm operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TRQ3
<b>Industry development programs initiated by Ministry of Finance &amp; Planning</b>							
12	Import duty concessions on Industrial Technology equipments had encouraged effective technology transfers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FPQ1
13	Promoting poultry industry based FDI had facilitated effective technology transfer into the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FPQ2
14	Funds allocation to the development of poultry industry had improved the technological standard of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FPQ3
<b>Infrastructure development initiatives from Ministry of Industry &amp; Commerce</b>							
15	Availability of satisfactory level of infrastructure to the industry such as uninterrupted electricity supply, water supply, road structure etc had helped to improve the farm operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ICQ1
16	Establishment of poultry industry clusters had improved the industry standards of technology usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ICQ2
<b>Academic initiatives from Ministry of Higher Education</b>							
17	Introduction of new industry related curriculum to the higher and vocation education system had improved the knowledge pool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HEQ1
<b>Knowledge Transfer initiatives from Academia and Research Institutes</b>							
18	Industrial training to students at sites had improved the knowledge transfer from industry to the students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ARIQ1
19	Availability of R&D facilities to carryout poultry industry related researches had enhanced the technology up gradation at the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ARIQ2
<b>Development programs by Guilds and Trade Associations</b>							
20	Coordination of animal health related issues with the government bodies had minimized the risk of wide spreading diseases.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GTAQ1
21	Effective knowledge transfer from foreign institutes to local poultry industry had enhanced technological capabilities of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GTAQ2
22	Availability of technology update information and access to them had minimized technology related issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GTAQ3



23	Training and knowledge transfer on best farm management practices had improved overall farm operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GTAQ4
24	Farmer development program through foreign trainings had transferred the knowledge into the local industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GTAQ5

**Industry development support programs in developing countries by Global Organizations**

25	Latest poultry industry technology update communication to local industry had eased the access to new technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GOQ1
26	Availability of studying opportunities at foreign universities for local talent pool had improved the industry technology standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GOQ2
27	International funds transfer for the development of poultry had improved the technological standards of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GOQ3

**Industry development programs at corporate level by Private sector**

28	conducting common knowledge transfer session into the industry had improved the technological capability of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PSQ1
29	Providing R&D funds had increased technological standards of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PSQ2
30	international technology transfer through private sector had uplifted the technology standards of the poultry industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PSQ3

**Technological Advancement of the Poultry Industry**

31	Standardized automated farm operation had increased the operational efficiency and productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ1
32	Introduction of Energy efficient mechanism to the industry had reduced the input cost to the poultry operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ2
33	Identification of alternative local raw material as substitute for imported raw material had reduced the input cost to the poultry operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ3
34	Implementation of Food Processing HACCP systems across value chain had ensured the compliance to Food processing regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ4
35	Introduction of best practices in food handling across the value chain had helped to meet the food regulatory requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ5
36	Introduction of latest Biological Waste Disposal and recycling methods had helped to meet the Environment compliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ6



37	Efficient Water management system in the poultry operation had improved the Environment compliance standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ7
38	Cleanliness & Good housekeeping practices in the poultry operation had ensured the environment compliance of the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ8
39	Best practice on Farm management of administration of vaccines and medicaments had improved the Bio security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ9
40	Adhering to the Environmental safety and sustainability of new sites had ensured the bio security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ10
41	Easy access to Veterinarian services had improved the bio security of the poultry industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PIQ11

This is the end of survey

Thank you very much for your participation in this survey.

Please save the document & mail to [lkkarunada@gmail.com](mailto:lkkarunada@gmail.com)

