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Modelling Business Sustainability in Agri Engineering Manufacturing Companies: Effect of Innovation, Technology and Business Model

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Abstract:Farm mechanization in Indian agricultural sector has been significantly supported by Agri Engineering Manufacturing Companies. It helps in tumbling the drudgery and thereby increasing the productivity of the labour. Indian agricultural machinery manufacturing sector is quite challenging which consists of countryside farmers, traditional small units, common craftsmen and small scale companies. They are the unorganised manufacturers, who are lacking proper infrastructure, business model and technology intervention. Hence this research has been conducted to identify and analyse the factors influencing the sustainability of Agri Engineering Manufacturing Companies. In this study quantitative research has been carried out. Agri Engineering Manufacturing Companies (AEMC) of the state of Karnataka has been considered as the study population. A total number of 372 AEMC spread across various districts of Karnataka have been identified to conduct the research. Initially the critical factors influencing the Business Sustainability of AEMC have been identified through Pilot Study. Further the variables influencing the Business Sustainability factors have been identified by reviewing scholarly journal articles and feedback collected from the Entrepreneurs of AEMC. The final Survey Questionnaire has been developed and validated by the Focus Group Discussion consisting of the panel members from academic background and Industry experts. Primary data has been collectedthroughtelephonic interview, Google Spread sheet and personal interview from the identified AEMC with the help of final Survey Questionnaire. A total number of 354 valid responses were received out of 372 AEMC, thus achieving 95% of response rate.Data analysis has been carried out by using Statistical Package for the Social Sciences 25 (SPSS 25) and Analysis of Moment Structures 25 (AMOS 25). Reliability test has been conductedand the Cronbach's alpha value 0.817 indicated a good level of internal consistency. Kaiser-Meyer-Olkin and Bartlett's Test has been conducted and the KMO value of 0.781was acceptable. Structural Equation Modelling (SEM) has been used to develop a model using the latent constructs such as Business Model, Innovation and Technology. There was significant improvement in the Goodness of Fit Statistics values when compared with the initial model and the new model. The Goodness of Fit Statistics values of the new model are Comparative Fit index (CFI) 0.988, Goodness of Fit Index (GFI) 0.958, Adjusted Goodness of Fit Index (AGFI) 0.923, Normated Fit Index (NFI) 0.956, Tucker Lewis Index (TLI) 0.980, Root mean square error of approximation (RMSEA) 0.031, Parsimony Normed-fit index (PNFI) 0.478 and these indicated a good model fit.

The key findings of the research indicate that, there is a need to improve the technological infrastructure and operating mechanism for the business sustainability. Also there is need to improve R &D facilities and supporting policies necessary for innovativeness such as open innovation and motivation for employees who bring innovative ideas.

Keywords: Innovation and Technology, Business Model, Business Sustainability, Agri Engineering Manufacturing Companies, Structural Equation Modelling, SPSS, AMOS.

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I. INTRODUCTION

Engineering and Technologyplays a major role in increasing the efficiency of farm inputs, equipments and machineries.At present the existing small time manufacturers are following traditional methods of manufacturing due to lack of innovation, technology and infrastructure. Inevitably the farmers are managing the farm operations with the existing facility. Even though the research organizations are working on the innovative designs of the equipments, the manufacturers are facing challenges in understanding the designs and executing the production activity due to lack of knowledge and infrastructure. There is a huge scope for the development of innovative and reliable farm equipments and machineries in adequate numbers by the Agri Engineering Manufacturing Companies (AEMC)[29].The use of appropriate farm equipments and machineries to carry out on time farm operations results in Farm Mechanization. Reduced demand for the labour, efficient farming, increased productivity and reduced drudgery are the major advantagesof Farm Mechanization. Manufacturing of precise, energy efficient, reliable and high capacity farm equipment and machineries enable precise and timely farm operations.

Farm mechanization is most essential for the small farmers for reducing the labour wages as they have the limitations of lower investments and land holdings. There is a necessity for R & D to develop the technology which can be used in AEMC to innovate electronic, automated and energy efficient farm equipment and machineries. Particularly multi-tasking farm machineries minimise the investment and serve the purpose of small time farmers thereby increasing the productivity and profitability[28].The diversity in the agricultural land and crops makes it necessary to understand the type of mechanization required, how and when should the technology to be implemented at the farm operations level [20].

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In India women farm workers involve in farming activities extensively to support their fellow men. It is very exhaustive for women to use traditional farming tools to carry out farming activities such as crushing of the clods after ploughing the field. Hence it is necessary for the AEMC to explore the technology to innovate farming tools which are light, strong, and easy to operate [7].

AEMC are facing challenges in terms of lack of safety standards for using farm equipment or machinery and also lack of standardised manufacturing norms to maintain quality standards. There is no option for AEMC entrepreneurs to keep higher margin for the products hence they are facing difficulties in making investments on upgrading the technology. AEMC also face the challenge of lack of information about the on field requirement of the products based on the type of land, climate and the type of crops and cultivation.

It is necessary for them to customise the products based on the requirement of the farmers [17][22]. Lack of proper Business Model may lead to loss of investment done on new technology [16]. Hence to address the business sustainability challenge of AEMC, in this article, a critical literature review from scholarly journals has been conducted to identify and analyse Business Model, Innovation and Technology as the significant factors influencing the Business Sustainability of AEMC.

II. LITERATURE REVIEW

A.Business Sustainability

According to the author, the initiatives taken to manage an organisation and its relationships in quest of social, economic and environmental associated performance enhancement along with the organisation's network of relationships has been termed as Business Sustainability. It transforms the inbuilt social and environmental constraints along with the basic activities of the organisation into business opportunities through products and services to generate incomeand move towards sustainable development. Business Sustainability is not only balancing social, environmental and economic stability but also responsible for the internal and external stakeholders [4]. Sustainability illustrates both opportunities and challenges for enterprises and it can prevail over financial crunch and meet the future needs [14]. Sustainability is expected to bring dramatic changes in the organisation by the activists [24]. It results in long term financial performance, hence organisations focusing on sustainable entrepreneurship believe in long term planning by balancing social, environmental and economic factors. The authors discussed about the major sustainability contributing factors in their research such as involvement of the board members in taking care of the social and environmental factors. It is required to maintain trustworthy relationship with the internal and external stakeholders. It is necessary to engage in employee welfare activities using non-monetary aids. It is important to set social standards for the suppliers and to maintain transparency at a higher level regarding non-financial information [21].

As part of content analysis, journal articles on Business Sustainability have been reviewed and the variables contributing to Business sustainability such as BS1, BS2, BS3 up to BS18 have been identified. These identified variables have been further used to develop the model using AMOS as shown in Figure 1 and Figure 2.

B. Business Model

According to the researcher,BusinessModel can be definedas a 'blueprint' of carrying out a business [2]. It means, a business is described at conceptual level but not at operational level. Whenever there is absence of standardised processes, the preliminary idea of business model takes birth in the mind of an entrepreneur and it will habitually undergo several changes before being finalised and implemented [23].Researchers have acknowledged the impact of endorsing business models and recorded that new enterprises have endorsed to design a business model that is sustainable [19].The authors in their research discussed about the factors responsible for business model development. The results showed that, few factors like lack of interaction between the stakeholders, frequent turnover in the members of the team and the funding support from external agencies were identified to have high influence on the business model. Hence they identified the above mentioned factors as the gaps to carry out further research [10].Business Models for sustainability of business have been discussed by various researchers in their research. Sustainable business model constitutes customer relationship, products or services, resources, activities, technology, cost and revenue [26]. The business models of organisations which focus on short term goals and are revenue centred often fail in achieving corporate sustainability. For such businesses environmental and social sustainability would not become a priority [12]. To achieve business sustainability, it is necessary for the business model to take care of the social, economic and environmental benefits of the stakeholders [15].Business model which involves the development and implementation of novel operating mechanisms, products, processes and marketing techniques results in organisation's sustainable performance [26]. An organisation can competitively position itself by offering quality products and services to its customers [13]. Business Model plays a dynamic role in transformation of markets and society resulting in sustainable entrepreneurship [27].Content analysis has been carried out by reviewing journal articles on Business Model. As an output of reviewed literature the variables contributing to Business Model such as BM1, BM2, BM3 up to BM12 have been identified. These identified variables have been further used to develop the model using AMOS as shown in Figure 1 and Figure 2.

C. Innovation and Technology

According to the researchers, the act of introducing new products/services, techniques, methods or practices can be defined as Innovation [3]. Researchers consider Innovation as a mandatory element for the organisations to be competitive [9]. The authors stated that, the growth oriented companies which continually offered new products thus occupying new market have always performed better [25].

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Innovation is a multidimensional complex concept, as it brings visible changes in the form of new products and also in terms of changes in the working standards [5].Innovation study depends on the industry, for example, innovation in manufacturing sector would be studied by emphasising the technology progress and its contribution, where as in service industry innovation study is emphasised on knowledge [3]. Technological innovation plays a vital role in achieving competitive success by occupying the major share in the market [1].It includes products or services or processes established the organisation that are novel or considerably advanced compared to the previously available with respect to functional and technical characteristics. The result of technological innovation makes a difference in the market in terms of the technical competence of the product or a process. It may not be an entirely new product or service or process to the market but it should be new at the level of an introducing organisation [3]. Small organisations have limitations in terms of resource for innovation.But researchers found that, lack of resource seems to be beneficial for innovation and always the small enterprises can explore ways to innovate by compensating lack of the resource. The author suggests having better understanding of the potential market before applying the available resource of small enterprises [25]. Content analysis has been carried out by reviewing journal articles on Innovation and Technology and the variables contributing to Innovation and Technology such as IT1, IT2, IT3 up to IT16 have been identified. These identified variables have been further used to develop the model using AMOS as shown in Figure 1 and Figure 2.

III. RESEARCH METHODOLOGY

In this study quantitative research has been carried out. Agri Engineering Manufacturing Companies (AEMC) of the state of Karnataka has been considered as the study population. A total number of 372 AEMC spread across various districts of Karnataka have been identified to conduct the research. Initially the critical factors influencing the Business Sustainability of AEMC have been identified through Pilot Study. Further the variables influencing the Business Sustainability factors have been identified by reviewing scholarly journal articles and feedback collected from the Entrepreneurs of AEMC. The final Survey Questionnaire has been developed and validated by the Focus Group Discussion consisting of the panel members from academic background and Industry experts. Primary data has beencollectedthroughtelephonic interview, Google Spread sheet and personal interview from the identified AEMC with the help of final Survey Questionnaire. A total number of 354 valid responses were received out of 372 AEMC, thus achieving 95% of response rate.

VI. DATA ANALYSIS

Primary data analysis has been carried out by using Statistical Package for the Social Sciences 25 (SPSS 25). Reliability test has been conducted to find the internal consistency of the data and the Cronbach's alpha value 0.817 indicated a good level of internal consistency [6]. Kaiser-Meyer-Olkinand Bartlett's Test has been conducted to find the adequacy of the variables for further conducting the Factor Analysis and the obtained KMO value of 0.781 which is acceptable [6].

V.STRUCTURAL EQUATION MODELLING

Structural Equation Modelling (SEM) is a multivariate statistical technique[8]. It is widely used to develop structural models according to the hypothesis formulated and to analyse the relationship between the variables and the constructs [18]. Analysis of Moment Structures 25 (AMOS 25) software has been used to develop the model using the latent constructs as shown in the below Figure1 and Figure 2.The below block represents the comparison between the Initial Model and the New Model.As per the Figure 1, the Initial Model was developed,this consisted of all the identified variablesalong with the latent constructs Business Model (BM), Innovation and Technology (IT) and Business Sustainability (BS). The observed endogenous variables considered for the analysis of the latent constructs BM, IT and BS were twelve, sixteen and eighteen respectively. They have been represented by the squared boxes in figure 1 and figure 2. They are individually connected to the same number of unobserved exogenous variables considering the unexpected error. The latent constructs are connected to each other through single and double headed arrows. Causal relationshiphas been represented by Single headed arrow and the correlation between the latent constructs or unobserved exogenous variables has been represented by double headed arrow. As per the requirement of the AMOS software and error variable EBS has been introduced to run the model. As per the AMOS software output, the Goodness of Fit Statistics values obtained have been listedabove. According to the researchers, Chi-square/degree of freedom (x^2/d.f) should be> 5, Goodness of Fit Statistics (GFI), Comparative Fit Index (CFI) and Adjusted Goodness of Fit Index (AGFI) should be> 0.90. Tucker Lewis Index (TLI) and Normated Fit Index (NFI) should be ≥ 0.90, Root Mean Square Error of approximation (RMSEA) should be < 0.08 and Parsimony Normed-fit index (PNFI) has to be within 0.5 [18]. But the values obtained for the above Initial Model does not indicate a good model fit.Further to improve the model fit, threshold value of 0.4 was applied to eliminate the insignificant variables. The analysis was continued by applying the Modification Indices (MI) as per the AMOS software output. After establishing the correlation between the exogenous unobserved variables and the latent constructs as per the output of AMOS software, New Model as shown in Figure 2 was obtained. The Goodness of Fit Statistics values drastically improved and have been listed in the above table. All the values obtained are as per the recommendations of the researchers and made a good model fit. Regression Weights of the Final Model have been listed in the below table 1.

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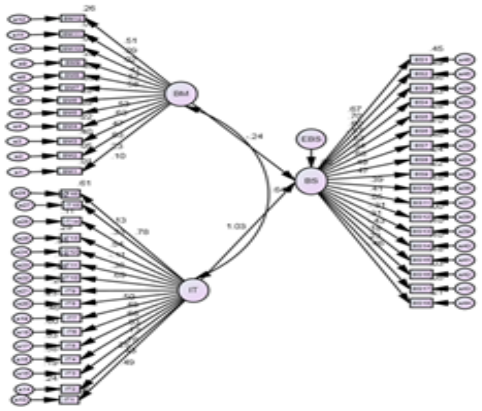

Figure 1: Initial Model

Chi-square	0.000
Chi-square/degree of freedom (x2/d.f.)	7.266
Comparative Fit index (CFI)	0.356
Goodness of Fit Index (GFI)	0.502
Adjusted Goodness of Fit Index (AGFI)	0.454
Normated Fit Index (NFI)	0.326
Tucker Lewis Index (TLI)	0.324
Root mean square error of approximation (RMSEA)	0.133
Parsimony Normed-fit index (PNFI)	0.310

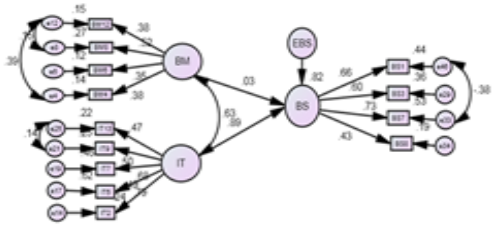

Figure 2: New Model

Chi-square	0.008
Chi-square/degree of freedom (x2/d.f.)	1.343
Comparative Fit index (CFI)	0.988
Goodness of Fit Index (GFI)	0.958
Adjusted Goodness of Fit Index (AGFI)	0.923
Normated Fit Index (NFI)	0.956
Tucker Lewis Index (TLI)	0.980
Root mean square error of approximation (RMSEA)	0.031
Parsimony Normed-fit index (PNFI)	0.478

Table 1: Regression Weights

Endogenous Variable			Estimate	Standard Error (S.E.)	Critical Ratio (C.R.)	P
BS	<---	IT	2.395	.317	7.564	.000
BS	<---	BM	-.523	.140	-3.720	.000
BM3	<---	BM	1.000			
BM5	<---	BM	1.733	.200	8.667	.000
BM7	<---	BM	1.686	.223	7.557	.000
BM9	<---	BM	1.848	.249	7.410	.000
IT2	<---	IT	1.000			
IT4	<---	IT	2.648	.304	8.720	.000
IT5	<---	IT	2.523	.290	8.696	.000
IT7	<---	IT	2.030	.247	8.228	.000
IT8	<---	IT	3.169	.479	6.611	.000
IT9	<---	IT	2.924	.392	7.468	.000
IT10	<---	IT	2.219	.242	9.186	.000
IT13	<---	IT	2.093	.277	7.546	.000
IT16	<---	IT	2.000	.222	8.993	.000
BS9	<---	BS	.670	.094	7.102	.000
BS8	<---	BS	1.162	.154	7.560	.000
BS7	<---	BS	.766	.069	11.043	.000
BS6	<---	BS	.935	.076	12.297	.000
BS3	<---	BS	1.000			
BS2	<---	BS	.881	.073	12.061	.000
BS1	<---	BS	.963	.088	10.896	.000

The above table 1 represents the Endogenous variables, Estimates, Standard Error, Critical Ratio and the 'p' value. The acceptance of the Hypothesis depends on the value of 'p' which should be less than 0.05[18].

Hypothesis

The following Alternative Hypothesis has been developed and proven by the p value obtained from the above analysis.

H_{a1}: Innovation and Technology has got positive influence on the Business Sustainability of Agri Engineering Manufacturing Companies.

H_{a2}: Effective Business Model has got positive influence on the Business Sustainability of Agri Engineering Manufacturing Companies.

VII. RESULTS AND CONCLUSION

In this research Business Model, Innovation and Technology have been linked to investigate the sources of Business Sustainability forAgri Engineering Manufacturing Companies and used to develop the Sustainability Model. In the growing field of Agri Engineering Manufacturing Companies, such kind of Sustainability Model will help for the implementation of sustainability for better performance. Using the alternative hypothesis developed an assumption has been made regarding the significant impact of the Business Model, Innovation and Technology on Business Sustainability. As per the results of the p value, the alternative hypotheses have been accepted stating the Business Model, Innovation and Technology have got positive influence on the Business Sustainability of Agri Engineering Manufacturing Companies. There are two kinds of models have been developed, one is Initial Model and the other one is New Model. Based on the Goodness of Fit Statistics values, the New Model shows good model fit. The key findings of the research indicate that, there is a need to improve the technological infrastructure and operating mechanism for the business sustainability. Also there is need to improve R &D facilities and supporting policies necessary for innovativeness such as open innovation and motivation for employees who bring innovative ideas. However, it was identified that, there are certain problems like cash inflow and corpus. For that proper strategic measure has to be adopted. Last but not the least, there is need for dynamic system approach and implementation of demand pull-push mechanism in upstream innovations will help Business Model for Business Sustainability.

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VIII. SCOPE FOR FURTHER RESEARCH

This article is part of an on ongoing research of the author; hence future work is restricted to the author only.

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REFERENCES

1. A. Detoni, Grandi, G. Petroni and A. Timidei, "Tecnologiaesviluppodell'impresa.UniversitàdegliStudi", di Parma, Istituto di scienzedell'ingegneria, Parma, 1988.
2. A. Osterwalder, Y. Pigneur,and C. L. Tucci, "Clarifying business models: origins, present, and future of the concept", Communications of AIS,2005, vol. 16, pp. 1-25.
3. B. Bigliardi, P. Colacino and A. I. Dormio, Innovative Characteristics of small and medium enterprises, Journal of Technology Management and Innovation, vol. 6(2), 2011, pp. 83-93.
4. C. H. Cagnin, D. Loveridge and J. Butler, "Business sustainability maturity model", Total Quality Management, 2005.
5. C. Oterao-Neita, M. T. Lindman, M. J. Fernàndez (2008). "Innovation and performance in SME furniture industries", Marketing Intelligence and Planning, 2008, vol. 27(2), pp. 216-232.
6. D. George, and M. Paul, *IBM SPSS Statistics 23 Step by Step*, New York, Routledge, 2016, pp. 231-260.
7. D. K. Vatsa and N. Vyas, "Modern farm technologies for enhancing work productivity with reduced drudgery of rural women in hill agriculture", Agricultural Mechanization in Asia, Africa and Latin America, vol. 49(3), 2018, pp. 32-38.
8. G. Devakumar, and G. Barani, "Marketing strategies for competitive advantage: structural equation modelling approach on agricultural sector industry in South India", *Int. J. Business Excellence*, vol. 9(2), 2016, pp.225-239.
9. G. N. Stock, N. P. Greis and W. A. Fisher, "Firm size and dynamic technological innovation", Technovation, 2002, vol. 22, pp. 537-549.
10. Reymen, R. O. Berend, and R. Stultiens, "Decision making for businessmodel development: aprocess study of effectuationand causation in newtechnology-based ventures". R & D Management, 2017, vol. 14(4), pp. 595-606.
11. J. Richardson, "The business model: an integrative framework for strategy execution". Strateg.Chang.2008, vol.17, pp. 133–44.
12. M. E. Porter and M. R. Kramer, "Creating Shared Value: How to reinvent capitalism - and unleash a wave of innovation and growth", Harv. Bus. Rev, 2011, vol. 89, pp. 62–77.
13. M. Morris, M. Schindehutte and J. Allen, The entrepreneur's business model: toward a unified perspective, Journal of Business Research, 58, 2005, pp. 726-735.
14. M. S. Tsai, M. C. Tsai and C. C. Chang, "The direct and indirect factors on affecting organizational sustainability", Journal of Management and Sustainability, vol. 2(4), 2013, pp. 67-77.
15. N. M. P. Bocken, S. W. Short, P. Rana and S. Evans, "A literature and practice review to develop sustainable business model archetypes", J. Clean. Prod., 2014, vol. 65, pp. 42–56.
16. N. Usha and G. Devakumar, "An analysis on critical parameters influencing sustainability for agri business industry: A systematic review and conceptual frame work", Asian Journal of Management, vol. 9(1), 2018, pp. 464-470.
17. N. Usha and G. Devakumar, "Determinants of sustainable business with respect to agricultural engineering manufacturing companies", Asian Journal of Management, vol. 10(1), 2019, pp. 61-66.
18. N. Usha and G. Devakumar, "Development of a model for the sustainability of agri engineering manufacturing companies in Karnataka, India", International Journal of Innovative Technology and Exploring Engineering, vol. 8(4), 2019, pp. 156-164.
19. P. Andries and K. Debackere, "Adaptation in new technology-based ventures: insights at the company level", International Journal of Management Reviews, 2006, Vol. 8(2), pp. 91-112.
20. P. S. James and F. M. Regina, "Techno-Economic appraisal for strategic planning of rice mechanization in Kerala, India", Agricultural Mechanization in Asia, Africa and Latin America, vol. 46(1), 2015, pp. 65-70.
21. R. G. Eccles, L. Loannouli and G. Serafeim, "The impact of a corporate culture of sustainability on corporate behavior and performance",Working Paper 12-035, May 9, 2012.Boston: Harvard Business School.
22. R. Kapur , S. Chouhan, S. Gulati and V. Saxena, "Transforming agriculture through mechanisation", A knowledge paper on Indian farm equipment sector, 2015, 1- 56.
23. Cavalcante, P. Kesting and J Ulhoi, "Business model dynamics and innovation: (re) establishing the missing linkages", Management Decision, vol. 49(8), 2011, pp. 1327-1342.
24. S. Henderson, "The development of competitive advantage through sustainable event management", *Worldwide* Hospitality and Tourism Themes, *vol. 3*(3), 2011, pp. 245–257.
25. S. Mosey, J. N. Clare and D. J. Woodcock, (2002). "Innovation decision making in British manufacturing SMEs". Integrated Manufacturing Systems, 2002, vol. 13(3), pp. 176-83.
26. S. N. Morioka, S. Evans and M. M. D. Carvalho, "Sustainable business model innovation: exploring evidences in sustainability reporting", 13th Global Conference on Sustainable Manufacturing - Decoupling Growth from Resource Use, Procedia CIRP 40, 2016, pp. 659-667.
27. S. Schaltegger, F. L. Freund and E. G. Hansen, Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation, Organization & Environment, 2016, pp. 1-26.
28. S. Singh, P. R. Singh, A. K. Singh and R. Gupta, " Present status and future need of mechanizing sugarcane cultivation in India", Agricultural Mechanization in Asia, Africa and Latin America, vol. 47(1), 2016, pp. 75-81.
29. V. M. Duraisamy, "Standardising the farm machinery research prototypes for commercialization-Case Study", Agricultural Mechanization in Asia, Africa and Latin America, vol. 49(3), 2018, pp. 7-11.

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