

# The Effects of Reducing Food Waste on Increasing the Quality of a Healthy Life

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***Abstract- Coordination of efforts between global sustainability and personal health is necessary. To lessen the burden of noncommunicable diseases, individuals are advised to eat a balanced diet. However, natural resource conservation also needs international attention. The latter phrase explicitly refers to strategies that effectively reduce food waste. Several studies have looked into the amount of food wasted in wealthy nations in the past. However, there is a serious shortage of information regarding the causes of food waste in homes. In order to combat food waste behavior and identify alternatives for developing preventive measures, the purpose of this article is to concentrate on the consumption of food waste for studying the determinants of food waste at the family level, which represents a large portion of the overall.***

***Indexed Terms- Food waste, mitigation, environmental knowledge and consumer attitudes.***

## I. INTRODUCTION

The amount of food that is wasted globally and its negative effects have drawn more attention in recent years. A crucial component of creating a sustainable food system is reducing food waste. In fact, food waste has three costs: first, it costs money, second, it affects society by raising food prices, decreasing access to food for the poorest, and increasing the number of malnourished people [1-5][6-10][11-18], and third, it degrades the quality of natural resources and produces greenhouse gases [1928]. In recent years, the issue of how food waste affects the environment has gone from being of interest to a small group of researchers to becoming a focus of institutional and public debate. This is a result of the spread of increasingly detailed information about the negative effects of rising food waste, particularly in developed nations, on the economy, society, and environment. The purpose of this study is to

investigate the factors that contribute to food waste in homes, paying particular emphasis to factors such household behavior, purchasing habits, attitudes, and lifestyle [29-38].

## II. LITERATURE REVIEW

According to FAO, a significant amount of produced food is wasted globally [39-45]. (2011) 280–300 kg per capita annually in rich nations and 120–170 kg per capita annually in poor nations. This type of waste is largely preventable [46-55]. Food is wasted at every stage of its life cycle, from harvesting to manufacture to distribution to consumption [56-58], yet households account for the majority of this waste. Food losses, according to the literature study, refer to the reduction in edible food mass throughout the supply chain's path to edible food intended for human consumption. In the food supply chain, they occur during the production, postharvest, and processing stages [59-61]. Food waste is the term used to describe food losses that occur at the end of the food chain (retail and final consumption) [62]. According to estimates from, post-harvest and processing losses account for 40% of losses in developing countries, whereas retail and consumer losses account for more than 40% of losses in affluent nations.

Although consumers were the single largest contributor to the volume of food waste, [63] found that little is known about the factors that influence food waste in households. In addition, only a small number of studies have looked specifically at consumer behavior and food preferences. According to the results of this research, people share the moral goal to not waste food, but they also have a tendency to do so [64].

There has been some investigation on the causes of food waste in Italy as well [65], although there are few details available regarding the likely culprits in

Italian families. Although the topics addressed in these studies serve as a useful beginning point, there is still a paucity of knowledge regarding the characteristics of Italian households' food waste behavior. A thorough understanding of the elements that contribute to the amount of wasted food seems to be crucial if we or they are to design successful interventions. This is because sustainable household waste management is becoming a significant priority for local and national authorities in Italy. Due to these factors, the current study's goal is to analyze food waste by focusing on consumption to uncover the causes of family-level food waste, which accounts for a sizable portion of total food waste in Italy, in order to combat this behavior and identify options for creating preventative measures.

Restaurant food waste is a problem that is raising political, corporate, and public awareness. It causes underuse of natural resources, harms the environment, lowers company profitability, and hastens the spread of poverty [66]. Restaurant food waste has increasingly been depicted in the media as a crime against the world and humanity due to these long-term harmful socioeconomic and environmental repercussions, with repeated calls for its urgent mitigation [67].

According to [67], reducing restaurant food waste is a crucial administrative job that calls for ongoing research support. To help managers determine the scope and identify the causes of restaurant food waste, scholarly study is required. Additionally, it must compile successful mitigation strategies using examples from various consuming markets and restaurant sub-sectors as well as "good business" practices. Last but not least, academic research should identify the factors that contribute to effective mitigation and advise decision-makers and experts in the field on how to take advantage of these factors [68]

Despite the obvious benefits, the scope of academic study on restaurant food waste is still quite small. The majority of transitional economies have not been examined in recent research, which have mostly concentrated on developed nations. This is a serious flaw considering how prevalent the problem of restaurant food waste is. The developed world is

characterized by mature markets for eating out and significant food waste. These markets are quickly developing in transitional countries, and restaurant food waste is increasing there in response, necessitating thorough research [68].

According to [69], one of the main causes of restaurant food waste is irresponsible consumer behavior, underscoring the need of involving patrons in its reduction. For consumer involvement to be successful, it is required to identify the factors that influence consumer behavior changes that are voluntarily pro-environmental and may reduce food waste, and to promote these factors in accordance with those factors. To decrease restaurant food waste in various consuming contexts, this topic is understudied, and little is known about how pro-environmental consumer behavior can be triggered and afterwards reinforced [72].

Restaurant food waste was originally acknowledged as a problem in the 1980s and Cummings made significant contributions to the field's early comprehension (1992). After that, the field of study essentially came to a standstill, and it wasn't until 2014 that scholarly interest in the subject was once again generated. Despite the "fresh" research outlook on restaurant food waste as a significant societal challenge, it is still under-examined, particularly when compared to other contexts where food wastage occurs, such as households [73-75] and grocery retail. By putting out a Conceptual Model of customer involvement in the reduction of restaurant food waste in Poland, this study adds to the body of knowledge. Although the conditions for pro-environmental consumer behavior in the context of household consumption in general have long been recognized, its applicability to eating out has never been examined.

### III. RESEARCH MODEL ADOPTED

According to the research framework, which forms the basis for the study problems, all of the concepts, meanings, and propositions are connected to the research questions. This research reveals that despite contemporary technical developments, the success assessment idea that has been widely employed in the

body of research has remained mostly based on the Research Model Adopted.

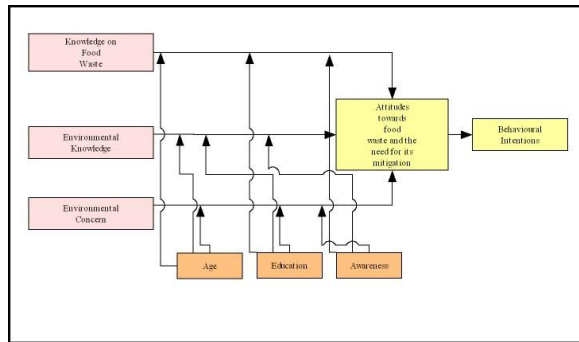


Figure 1: Research Model Adopted

### CONCLUSION

Despite the presence of several factors in previous studies (Knowledge on Food Waste, Environmental Knowledge, Environmental Concern, and Attitudes towards food waste and the need for its mitigation), no completed model has been developed to assess the intricate relationships between these factors and the Behavioural Intentions of Reducing Food Waste on Improving Healthy Life Quality.

### REFERENCES

[1] Ahad, M. A., Paiva, S., & Zafar, S. (2020). Sustainable and Energy Efficient Computing Paradigms for Society. Springer International Publishing AG.

[2] Al-Ahmad, A., Ahmaro, I. Y., & Mustafa, M. (2017). E-learning Difficulties in Jordan. MEDIU publications, 1(5).

[3] Al-Ahmad, A., Ahmaro, I. Y., & Mustafa, M. (2017). E-learning Difficulties in Jordan. MEDIU publications, 1(5).

[4] Al-Ahmad, A., Ahmaro, I. Y., & Mustafa, M. (2017). Importance of UML model in the RUP Development lifecycle along with the time and the static aspect of the process. Al-Madinah Technical Studies, 1(4).

[5] Li Yan, Mohd Wazih Ahmad, Malik Jawarneh, Mohammad Shabaz, R. Raffik, Kakarla Hari Kishore, "Single-Input Single-Output System with Multiple Time Delay PID Control Methods for UAV Cluster Multiagent Systems", Security

and Communication Networks, vol. 2022, Article ID 3935143, 7 pages, 2022. <https://doi.org/10.1155/2022/3935143>

[6] Jawarneh, M., Alshare, M., Bsoul, Q. and Kalash, H.S., The Impact of Machine Learning On Educational Institutions: An Empirical Study.

[7] Al-Ahmad, A., Ahmaro, I. Y., & Mustafa, M. Classifying Disease Related Data Sets and Building a System for predicting and diagnosing Such Diseases Us-ing Decision Tree Mining Algorithm.

[8] Al-Ahmad, A., Ahmaro, I., & Mustafa, M. (2015). Comparison between web accessibility Evaluation tools. AlMadinah Technical Studies, 1(4).

[9] Alkhatib, K., Al-Aiad, A., Mustafa, M., & Alzubi, S. (2021). Impact factors affecting entrepreneurial intention of Jordanian private universities students: a mediation analysis of perception toward entrepreneurship. In Sustainable and Energy Efficient Computing Paradigms for Society (pp. 53-65). Springer, Cham.

[10] Huo, Z., Luo, X., Wang, Q., Jagota, V., Jawarneh, M. and Sharma, M., 2022. Design and simulation of vehicle vibration test based on virtual reality technology. *Nonlinear Engineering*, 11(1), pp.500-506.

[11] Al-Mushasha, N. F., & Hassan, S. (2009). A model for mobile learning service quality in university environment. International Journal of Mobile Computing and Multimedia Communications (IJMCMC), 1(1), 70- 91.

[12] Jawarneh, M.M., 2022. Factors affecting the success of VR-learning implementation in institutes of higher learning in Jordan. *benefits*, 10, p.18.

[13] Alshar'e, M., & Mustafa, M. (2021). Evaluation of autistic children's education in Oman: the role of eLearning as a major aid to fill the gap. Elementary Education Online, 20(5), 5531-5540.

[14] Alshar'e, M., & Mustafa, M. (2021). Evaluation of autistic children's education in Oman: the role of eLearning as a major aid to fill the gap.

- Elementary Education Online, 20(5), 5531-5540.
- [15] Alshar'e, M.I., R. Sulaiman, M.R. Mokhtar and A. MohdZin, 2014. Design and implementation of the TPM user authentication model. *J. Comp. Sci.*, 10: 2299-2314. DOI: 10.3844/jcssp.2014.2
- [16] Alshar'e, M.I., R. Sulaiman, M.R. Mukhtar and A.M. Zin, 2014. A user protection model for the trusted computing environment. *J. Comput. Sci.*, 10: 1692-1702. DOI: 10.3844/jcssp.2014.1692.1702.
- [17] Alshar'E, Marwan, Abdullah Mohd Zin, Rossilawati Sulaiman, and Mohd Rosmadi Mokhtar, 2015 "Evaluation of the TPM user authentication model for trusted computers." *Journal of Theoretical and Applied Information Technology* 81(2): 298-309.
- [18] Alzubi, F., & Mustafa, M. (2021). Critical Review of A Recent and Significant Change in the (Primary Health Care Center) in Lights of Thr Contemporary Reserch and Best Practice.
- [19] Arshad, H., Mustafa, M., & BadiozeZaman, H. (2015). Design of Vibratory Haptic Interface Model (VHIM) for Autistic Children's Social Interaction. *Asian Journal of Information Technology*, 14(3), 111-116.
- [20] Arumugam, K., Swathi, Y., Sanchez, D. T., Mustafa, M., Phoemchalard, C., Phasinam, K., & Okoronkwo, E. (2021). Towards applicability of machine learning techniques in agriculture and energy sector. *Materials Today: Proceedings*.
- [21] Bholra, J., Jeet, R., Jawarneh, M. M. M., & Pattekari, S. A. (2021). Machine Learning Techniques for Analysing and Identifying Autism Spectrum Disorder. In *Artificial Intelligence for Accurate Analysis and Detection of Autism Spectrum Disorder* (pp. 69-81). IGI Global.
- [22] BIO-CELL CULTURE PROCESSES IN REAL-TIME MONITORING APPROACH WITH MACHINE LEARNING TECHNIQUES. NAGALAKSHMI.T, MAMTA SHARMA , MALIK MUSTAFA MOHAMMAD , ZATIN GUPTA , ASHISH KUMAR TAMRAKAR , AND BESLIN GEO.V.
- [23] Brahmi, B., & Mustafa, M. (2019). Impact of Knowledge Management Process on Managerial Performance in the High Tech Sector. *International Journal of Business and Management*, 14(2).
- [24] Bsoul, Q., Abdul Salam, R., Atwan, J., & Jawarneh, M. (2021). Arabic Text Clustering Methods and Suggested Solutions for Theme-Based Quran Clustering: Analysis of Literature. *Journal of Information Science Theory and Practice*, 9(4), 15-34.
- [25] Chakraborty, C., Banerjee, A., Garg, L., & Rodrigues, J. J. (2020). Internet of Medical Things for Smart Healthcare. *Studies in Big Data*; Springer: Cham, Switzerland, 80.
- [26] Chen, H. J. (2010). Linking employees'e-learning system use to their overall job outcomes: An empirical study based on the IS success model. *Computers & Education*, 55(4), 1628-1639.
- [27] Cordova, R.S., Maata, R.L.R., Epoc, F.J. and Alshar'e, M., 2021. Challenges and Opportunities of Using Blockchain in Supply Chain Management. *Global Business and Management Research: An International Journal* , pp. 204-217, 13(3).
- [28] "Bio-Cell Culture Processes in Real-Time Monitoring Approach with Machine Learning Techniques." *International Journal of Biology, Pharmacy and Allied Sciences*, vol. 10, no. 11 (SPECIAL ISSUE), 2021, <https://doi.org/10.31032/ijbpas/2021/10.11.1044>
- [29] Zhao, Wei, et al. "Design of Die-Casting Die for Engine Cylinder Head Based on 3D Printing and Genetic Algorithm." *Computer-Aided Design and Applications*, 2022, pp. 190-199., <https://doi.org/10.14733/cadaps.2023.s3.190-199>.
- [30] Mustafa, Malik, et al. "Multitask Learning for Security and Privacy in Iov (Internet of Vehicles)." *Autonomous Vehicles Volume 1*, 2022, pp. 217-233., <https://doi.org/10.1002/9781119871989.ch12>.
- [31] DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information

- systems success: a ten-year update. *Journal of management information systems*, 19(4), 9-30.
- [32] Franklin, D. L. (2009). What Kind of Business-Friendly Court-Explaining the Chamber of Commerce's Success at the Roberts Court. *Santa Clara L. Rev.*, 49, 1019.
- [33] Heo, J., & Han, I. (2003). Performance measure of information systems (IS) in evolving computing environments: an empirical investigation. *Information & management*, 40(4), 243-256.
- [34] Jawarneh, M. M. (2008). *Web-Based Patient Medical Record History* (Doctoral dissertation, Universiti Utara Malaysia).
- [35] Kassanuk, T., Mustafa, M., & Panse, P. (2021). An Internet of Things and Cloud Based Smart Irrigation System. *Annals of the Romanian Society for Cell Biology*, 20010-20016.
- [36] Kollu, P. K. (2021). Blockchain Techniques for Secure Storage of Data in Cloud Environment. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(11), 1515-1522.
- [37] Kuthadi, V. M., Selvaraj, R., Rao, Y. V., Kumar, P. S., Mustafa, M., Phasinam, K., & Okoronkwo, E. TOWARDS SECURITY AND PRIVACY CONCERNS IN THE INTERNET OF THINGS IN THE AGRICULTURE SECTOR. *Turkish Journal of Physiotherapy and Rehabilitation*, 32(3).
- [38] McGarry, D., Cashin, A., & Fowler, C. (2011). "Coming ready or not" high fidelity human patient simulation in child and adolescent psychiatric nursing education: Diffusion of innovation. *Nurse Education Today*, 31(7), 655-659.
- [39] Mustafa, M. (2021). Coping with and Analysing Factors Impacting Omani Colleges Students' Entrepreneurial Intent during Covid-19 Pandemic. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(11), 7019-7031.
- [40] Mustafa, M. Y., Hassan, S. S., & Ahmad, M. D. (2007). Frequency of occurrence of mastitis in different quarters of udders and its cure-a field study. *Biologia*, 53, 51-57.
- [41] Mustafa, M., & Abbas, A. (2021). comparative analysis of green ict practices among palestinian and malaysian in sme food enterprises during covid-19 pandemic. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(4), 254-264.
- [42] Mustafa, M., & Al-Badi, A. (2021). Role of Internet of Things (IoT) Increasing Quality Implementation in Oman Hospitals During Covid-19. *SPAST Abstracts*, 1(01).
- [43] Mustafa, M., & Alzubi, S. (2020). Factors affecting the success of internet of things for enhancing quality and efficiency implementation in hospitals sector in Jordan during the crises of Covid-19. In *Internet of Medical Things for Smart Healthcare* (pp. 107-140). Springer, Singapore.
- [44] Mustafa, M., Abbas, A., Bsoul, Q., & Shabbir, A. (2021). Smart Irrigation System Based on the Internet of Things and the Cloud.
- [45] Mustafa, M., Alshare, M., Bhargava, D., Neware, R., Singh, B., & Ngulube, P. (2022). Perceived Security Risk Based on Moderating Factors for Blockchain Technology Applications in Cloud Storage to Achieve Secure Healthcare Systems. *Computational and Mathematical Methods in Medicine*, 2022.
- [46] Mustafa, M., Alshar'e, M., Shariah, A., Al-Alawi, M., & Mohammad, A. (2021). Managing and analyzing factors influencing Saudi college students' entrepreneurial intention during the Covid-19 pandemic. *Turkish Journal of Physiotherapy and Rehabilitation*, 7486-7496.
- [47] Mustafa, M., Alzubi, F. K., & Bashayreh, A. (2021). Factors Affecting Job Performance of Teaching and NonTeaching Staff in Higher Education Levels in Oman. *Ilkogretim Online*, 20(5).
- [48] Mustafa, M., Alzubi, S., & Alshare, M. (2020, April). The Moderating Effect of Demographic Factors Acceptance Virtual Reality Learning in Developing Countries in the Middle East. In *International Conference on Advances in Computing and Data Sciences* (pp. 12-23). Springer, Singapore.
- [49] Mustafa, M., Arshad, H., & Zaman, H. B. (2013, December). *Framework Methodology of*

- the Autism Children-- Vibratory Haptic Interface (AC-VHI). In 2013 International Conference on Advanced Computer Science Applications and Technologies (pp. 201-206). IEEE.
- [50] Mustafa, M., Virmani, D., Kaliyaperumal, K., Phasinam, K., & Santosh, T. (2021). Towards Investigation of Various Security And Privacy Issues In Internet Of Things. *Design Engineering*, 1747-1758.
- [51] Najjar, F., Bourouis, S., Alshar'e, M., Alroobaea, R., Bouguila, N., Al Badi, A. H., & Channoufi, I. (2020, September). Efficient Statistical Learning Framework with Applications to Human Activity and Facial Expression Recognition. In 2020 5th International Conference on Advanced Technologies for Signal and Image Processing (ATSIP) (pp. 1- 6). IEEE.
- [52] Surindar Gopalrao Wawale, Malik Jawarneh, P. Naveen Kumar, Thomas Felix, Jyoti Bhola, Roop Raj, Sathyapriya Eswaran, Rajasekhar Boddu, "Minimizing the Error Gap in Smart Framing by Forecasting Production and Demand Using ARIMA Model", *Journal of Food Quality*, vol. 2022, Article ID 1139440, 9 pages, 2022. <https://doi.org/10.1155/2022/1139440> [46] MUSTAFA, MALIK. "Impact Factors of Smart Technology in Small and Medium Enterprises." (2021).
- [53] Nielsen, S. E., Johnson, C. J., Heard, D. C., & Boyce, M. S. (2005). Can models of presence-absence be used to scale abundance? Two case studies considering extremes in life history. *Ecography*, 28(2), 197-208.
- [54] Pallathadka, H., Mustafa, M., Sanchez, D. T., Sajja, G. S., Gour, S., & Naved, M. (2021). Impact of machine learning on management, healthcare and agriculture. *Materials Today: Proceedings*.
- [55] Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems*, 17(3), 236-263.
- [56] Mustafa, M., 2021. Impact of Digital Strategy in Business for Small and Medium Enterprises in Developing Countries. [51] Piercy, N., Phillips, W., & Lewis, M. (2013). Change management in the public sector: the use of cross-functional teams. *Production Planning & Control*, 24(10-11), 976-987.
- [57] Sajja, G. S., Mustafa, M., Ponnusamy, R., & Abdulfattokhov, S. (2021). Machine Learning Algorithms in Intrusion Detection and Classification. *Annals of the Romanian Society for Cell Biology*, 25(6), 12211-12219.
- [58] Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information systems research*, 8(3), 240-253.
- [59] Mustafa, Malik. "Mobile Banking App Development and Implementation." (2021). [57] Shabaz, M., Singla, P., Jawarneh, M. M. M., & Qureshi, H. M. (2021). A Novel Automated Approach for Deep Learning on Stereotypical Autistic Motor Movements. In *Artificial Intelligence for Accurate Analysis and Detection of Autism Spectrum Disorder* (pp. 54-68). IGI Global.
- [60] Mustafa, Malik. "Impact of Information Technology on the Banking Sector in Developing Countries." (2021).
- [61] SINGHAL, MANMOHAN, SATHISH KUMAR PENCHALA, and DHEERAJ RANE. "STUDY ON NETWORK MODEL ON TRANSMISSION OF INFECTIOUS DISEASES IN HOSPITALS."
- [62] Tella, A. (2011). Reliability and factor analysis of a blackboard course management system success: A scale development and validation in an educational context. *Journal of Information Technology Education: Research*, 10(1), 55-80.
- [63] MUSTAFA, MALIK. "The Effect of Using M-Banking System Approach in Small and Medium Enterprises." (2021). [62] Wang, Y. S., Wang, H. Y., & Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behavior*, 23(4), 1792-1808.

- [64] Mustafa, Malik. "The technology of mobile banking and its impact on the financial growth during the covid-19 pandemic in the gulf region." *Turkish Journal of Computer and Mathematics Education (TURCOMAT)* 12, no. 9 (2021): 389-398.
- [65] Gao, Huixian, Ahmed Kareem, Malik Jawarneh, Isaac Ofori, R. Raffik, and Kakarla Hari Kishore. "Metaheuristics Based Modeling and Simulation Analysis of New Integrated Mechanized Operation Solution and Position Servo System." *Mathematical Problems in Engineering* 2022 (2022).
- [66] MUSTAFA, M., 2021. Mobile Banking as Technology Adoption and Challenges. [66] Wawale, Surindar Gopalrao, Malik Jawarneh, P. Naveen Kumar, Thomas Felix, Jyoti Bhola, Roop Raj, Sathyapriya Eswaran, and Rajasekhar Boddu. "Minimizing the Error Gap in Smart Framing by Forecasting Production and Demand Using ARIMA Model." *Journal of Food Quality* 2022 (2022).
- [67] Mustafa, M. (2021). Mobile Phone Technology in Banking System.
- [68] Mustafa M. The Adoption of Mobile Banking Services in Jordanian Banks and Factors Affecting the Customers. *ECS Transactions*. 2022 Apr 24;107(1):2483.
- [69] Mustafa, Malik, and O. A. A. J. Aldein. "Examining Perception of Malaysian autistic children social interaction for Virtual Reality." Zenodo, Dec-2020.
- [70] Smail, B., Sanchez, D.T., Peconillo Jr, L.B., De Vera, J.V., Horteza, A.D. and Jawarneh, M., 2022. Investigating different applications of Internet of Things towards identification of vulnerabilities, attacks and threats. *International Journal of Next-Generation Computing*, 13(3).
- [71] Zhao, W., He, C., Gill, R., Jawarneh, M., & Shabaz, M. (2022). Design of die-casting die for engine cylinder head based on 3D printing and genetic algorithm. *Computer-Aided Design and Applications*, 190-199. doi:10.14733/cadaps.2023.s3.190-199
- [72] Alshar'e, M., Albadi, A., Jawarneh, M., Tahir, N. and Al Amri, M., 2022. Usability evaluation of educational games: an analysis of culture as a factor Affecting children's educational attainment. *Advances in Human-Computer Interaction*, 2022.
- [73] Nageswaran, S., Arunkumar, G., Bisht, A.K., Mewada, S., Kumar, J.N.V.R., Jawarneh, M. and Asenso, E., 2022. Lung cancer classification and prediction using machine learning and image processing. *BioMed Research International*, 2022.
- [74] Ansari, A.S., Jawarneh, M., Ritonga, M., Jamwal, P., Mohammadi, M.S., Veluri, R.K., Kumar, V. and Shah, M.A., 2022. Improved Support Vector Machine and Image Processing Enabled Methodology for Detection and Classification of Grape Leaf Disease. *Journal of Food Quality*, 2022.