Role of Bangladeshi Women in Diverse Agricultural Production: A Review

Kakon Chakma and Umama Begum Ruba

ABSTRACT

Bangladeshi women are traditionally involved in various agricultural activities but most of their efforts remain unnoticed. To emphasize the significance of women's role in agricultural production, this paper highlights the major activities performed by Bangladeshi women in diverse agricultural production based on published literature. It was observed that Bangladeshi women are subjected to face social restrictions, but despite this, they are active participants in field and homestead crops production, poultry and livestock rearing, and fisheries management. They are predominantly involved in post-harvesting activities of field crops production. They retain control over all activities of homestead crops production. Management activities of poultry and livestock rearing, and fish culture are mostly performed by women. Women's involvement in such activities improves socioeconomic conditions by increasing household food security, family nutrition, and employment opportunities, all of which contribute to a more stable lifestyle. Bangladeshi women's contributions to agricultural production are noteworthy which should be recognized, appreciated, and valued.

Keywords: Agriculture, Agricultural Production, Role of Women, Bangladesh.

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I. INTRODUCTION

Agriculture is a potential sector in Bangladesh that acts as a foundation for ensuring continuous sustainable growth. Bangladesh's population has been entirely reliant on agricultural sector for survival since the country's founding. In Bangladesh, agricultural sector has a greater contribution to GDP and becomes an integral part of the country's sustainable development. Crops, horticulture, animal farming, forestry, and related services account for about 13.32% of total GDP, with a growth rate of 9.26% [1]. This sector comprises crops, fisheries, and livestock which are playing a vital role in ensuring food security additionally generating employment for large population. A significant percentage of the population (around 80%) relies on agricultural sector for jobs and income generation, both directly and indirectly [2]. Since women account for 50% of the country's population, their contribution has substantial influence on economic productivity, growth, and sustainability. The World Bank reported, "Agriculture sector provides 25.3% of women employment". Women labor force participation rate has risen from 24.73% in 1990 to 36.41% in 2020, accounting for nearly 20% of overall GDP [3]. Bangladeshi women are traditionally active in diverse agricultural activities in addition to domestic chores. Women are responsible for constituting 65% of the farm labor force in Bangladesh [4] also more than 70% of female workers are implicated in the agri-sector including forestry and fisheries [5]. Agricultural growth, development, workforce is

constituted by women through their direct involvement in crop production, livestock rearing, fisheries, and diverse resources management and thus they are fulfilling livelihood and commercial demand [6]. FAO [7] reported that "Women in developing countries produce between 60% to 80% of the grain, accounting for 50% of the world's food supply". To emphasize the importance of women's efforts in the agricultural sector, this study brings together previously published literature that highlights major activities carried out by Bangladeshi women in agricultural production that are crucial to achieving Sustainable Development Goals such as zero poverty, zero hunger, and gender equality.

Fig. 1. (%) Female Labor Force Participation in Bangladesh [3].

II. BANGLADESHI WOMEN IN AGRICULTURAL PRODUCTION: CONCERN, INVOLVEMENT, AND EMPOWERMENT

Women's significance to agriculture cannot be underestimated, but their lack of identity as "female farmers" is major concern [8]. Women's triple role as farmers, caretakers, and household income earners is hindered by social constraints [9]. Most of their contribution unnoticed, and unrecognized, and is treated as household labor [10]. Women's empowerment is hindered by family limits, religious legislation, early marriage, illiterate guardians, and lack of social consciousness [11]. Income opportunities of women are greatly influenced by their lack of ownership over physical and human capital [12]. Gender biases are exacerbated by sociocultural and gender-specific dominating patterns, which increase men's influence over resources, limiting women's opportunities [13]. Since participation in agricultural innovation and opportunities is gender-specific, gender standard behaviors influence technological innovation and acceptance in the agriculture system, and therefore no beneficiaries could be established [14]. Rural women in agriculture production are still under this kind of socio-economic constraint [15]. Even educated female entrepreneurs are not out of these problems in Bangladesh [16]. Despite these challenging situations, women are providing valuable contributions to national assets. Women are engaged in diversified farm and nonfarm activities such as crop farming, vegetable farming, post-harvesting activities, homestead crop production, livestock rearing, poultry farming, and fish culture [17]. Women are directly involved in post-harvesting activities in field crop production [18] and devote more time than men. Supportive programs aimed at raising women's capacity to perform post-harvesting activities are promoted to boost food safety and security at household and national levels [19]. Homestead crop raising and ensuring food security of a family are accomplished by the active performance of women as women raise crops along with nursing, watering, harvesting, and management. Besides homestead gardening, women also play a managerial role to maintain livestock, poultry, and fisheries resources. Such participation in income-generating activities can transcend social limitations, resulting in women's empowerment. Women's involvement in agricultural extension increases their business efficiency, which aids in poverty reduction, food security, and household nutrition [20]. Eliminating discriminatory practices for equality, social development along with enforcing government programs and policies for gender transformative change [21]. Women's engagement in diverse entrepreneurial segments such as agriculture enhances their empowerment culturally, socially, and economically [22]. Income-generating programs, education, training, awareness-raising, and involvement in the health, agriculture, education, and development sectors including local and institutional organizations, should all be strengthened for greater empowerment [11].

III. ROLE OF WOMEN IN FIELD CROPS PRODUCTION

As household workers and hired female labor, female farmers make a significant contribution to agricultural activities. Women participated in agricultural activities to

meet basic family needs, raise family income, and meet additional family responsibilities [23]. Crop diversification increases due to increase in women's empowerment [24]. Rice, jute, sugarcane are major field crops produced in Bangladesh which are grown year-round in Bangladesh [1]. In Bangladesh, rice is the primary staple food most farm families grow rice for family consumption [25]. As consequence its common for farm women in Bangladesh to involve in rice processing. Rice farming requires a lot of work, and women's presence serves as family labor [26]. Bangladeshi women are actively engaged only in post-harvesting activities [18] and they performed the post-harvest tasks which are seedling raising, weeding, threshing, sorting and cleaning, boiling, drying straw, and storing besides doing their household responsibilities [27]. In contrast to men, women engage more in drying and spend more time on storage tasks [19]. Besides post-harvesting activities, sometimes women also play a satisfactory role in weeding and transplanting of rice [28]. Women's role in crop production is heavily influenced by socio-economic reasons [20], [23], [28]. Also, Distance of field from their location, technological use, and available male adults in the family affect women's engagement at the field level [27]. Women face wage discrimination [8] and low wage rate [19]. Hence, gender discrimination in wages need to be eliminated [27], [29] along with ensuring supportive environment and attitude toward working women [27]. Women-friendly crop processing technologies for pre-harvesting and post-harvesting should be established to ensure women's successful position in the agro-sector [18]. Productivity and technical efficiency enhance because of significant contribution of women in agricultural labor [30]. Investment in schooling, crop diversification, introducing hired labor market for women, modification of tenancy market needs to be focused to ameliorate women's access in agricultural productivity and efficiency [30].

IV. ROLE OF WOMEN IN HOMESTEAD CROPS PRODUCTION

Women's homestead gardens are a promising intervention for improving nutrition in poor rural households by increasing the availability and consumption of a variety of vegetables [31]. Aesthetically, socially, and environmentally, species planting in the homestead area is desirable [32]. Women play a crucial role in diverse activities to meet basic family needs, raise family income, and meet additional family responsibilities [23]. Women value homestead gardens because they provide key benefits related to health, food security, revenue, and environment [33]. Women's increased participation in a variety of home garden management activities is important not only for improving quality of life but also for sustaining the livelihoods of their communities and retaining agrobiodiversity in homestead gardens [33]. Women's participation in decision-making is rising day by day as they participate in homestead activities regularly [34]. Several studies in Bangladesh found that salient features of women had significant relation with their participation in homestead garden [23], [29], [35]-[37]. Women are nearly involved in overall different activities of homestead garden such as land selection, land preparation, cultural operation, nutrient management, pest management, irrigation, drainage,

harvesting, and post-harvesting [29], [35]-[37] with a medium participation extent [29], [35], [37]. Barriers found related to women in homestead crops production are absence of proper planning [32], no specific objectives and goals [32], lack of proper scientific knowledge [32], [36], lack of good quality seeds in proper time [36], shortage of irrigation water [36], lack of adequate quantity fertilizer in proper time and insect attack [36]. Participation of women in homestead vegetable production was not satisfactory level [29], [35]. To enhance participation researcher suggested establishing proper planning and management mechanisms [32], proper training [29], [31], [32], [37], marketing opportunity [37], available credit facility [37], providing necessary technological and management-related information [29], improvements in extension and support services [29], [35]. To fulfill the ever-increasing food demand, nutrition, and employment [32], [34], homestead agricultural programs are required [29], [38].

V. ROLE OF WOMEN IN POULTRY AND LIVESTOCK REARING

In Bangladesh, poultry and livestock are the major farming sectors besides crops. Cow, sheep, chicken, goat, and duck farming are most popular within farm families which are the primary source of protein. Bangladeshi farm women are directly involved in animal rearing, but their participation is affected by socio-economic factors [39], [40]. Participation in animal farming has significant relationship with income [41], food security [42], and empowerment [43], [44]. Women participated in livestock farming primarily to increase income and social recognition, which resulted positive shift in their lives and gave them more power over their decisions and income [41]. Bangladeshi women play a key role in active economic participation in livestock raising, which helps them overcome discrimination, socio-economic constraints, and attain full empowerment [41]. It was observed from recent studies [36], [39], [40], [42], [45], women perform managerial roles in livestock and poultry rearing within different locations of Bangladesh. Women were heavily involved in livestock and poultry rearing decision-making, as well as in practices involving livestock and poultry such as treatment and handling, transformation, and selling of specific livestock products [45]. In case of poultry rearing, women had high participation [36] and they are involved in giving feed, taking care, cleaning of shed, egg collection, and egg selling [36] [42]. Women had medium level of participation in livestock raising [36] and several studies [39], [40], [42] revealed that women are extensively involved in cutting straw, watering cattle, treatment of new calves, maintenance of cows, cleaning of sheds, cow dung collection, animal care, bathing and washing of animals, and milk product preparation in livestock farming, but their involvement in farm record keeping, product storage, straw feeding, buying of fodder and feeds, purchasing of livestock and equipment is limited. In livestock and poultry farming, women faced various problems which are lack of credit [41], [46], lack of capital [41], lack of livestock rearing knowledge [46], high price of feeds & fodder [41], [46], lack of high-quality feed [46], low quality semen & breed [41], [46], lack of training facilities [41], [46], improper management

practices [46], high rate of interest [41], lack of land [41],[46], lack of profit [41], low price of livestock products [41], inadequate vet. Services [41], anthelmintic and diseases [46], shortage of medicines [46], security problem [41], environmental hazards [46], and discourage from husband [41]. This form of monetary activity has enough potential to eliminate gender inequality, minimize of early marriages, reduce spousal violence, and encourage the creation of new realistic knowledge, skills, and confidence [43] that can improve the livelihood status of women [40], [43], [44], [47]. Although women play a key role in livestock farming, they have very little control over those assets due to socio-economic standing and cultural values [42]. Increased income may improve women's status, but in reality, it does not reflect always, so the government, NGOs, and other development agencies should prioritize improving women's social status as an incentive for their contribution [45]. The researcher made several recommendations to increase participation in this sector which are special marketing facilities [39], [47], [48], technology [39], special extension program [39], low-interest bank credit [48], subsidy [47], [48], use of fallow land [47], [48], establishment of livestock (milk, meat, poultry) processing industries [48].

VI. ROLE OF WOMEN IN FISHERIES MANAGEMENT

Bangladesh has achieved substantial food production through fisheries sector wherein the land constitutes a total of 84.69% and marine fisheries contribute 15.31% of fish production [49]. Women contribute significantly to fisheries resource management by performing socio-economic tasks in and outside the family [50], thus increases assets of family [51]. Increased female agricultural involvement is an optimistic and admirable indicator of economic growth, socio-economic progress, and nutritional advancement [52]. Women's role in pond fisheries activities enhances substantial income for family, supply of family nutrition, self-employment opportunities, and socio-economic condition [53]. Though a large part of women takes fisheries activities on a part-time basis [50], they perceive a positive attitude in fish culture, fish processing, and also for using scientific methods for fish production [51]. In case of fish culture, women have significant participation in feeding the fish [51], [52], [54]-[56], feed preparation [52], [55], fertilization [52], [55], cleaning aquatic vegetation [53]-[57], pond preparation [53], pond supervision and management [52], [53], [55], harvesting [51]-[53], [55], marketing and trading [53], [55], [56]. Women also work in fish polyculture, conducting duties such as liming, pond drying, medication, seed supply, marketing, and trading [55]. Intra household decision-making patterns, gender, and social norms, restricted mobility, lack of financial assets and family support, unavailability of human and social capital affect women's participation in aquaculture [58]. Along with these, quality seed problems [56], high price of inputs [51], [53], lack of credit [51], lack of education [51], insufficient technological knowledge [51], [56], marketing problems [56], unavailability of extension supports [51], Communication difficulties [51], thief or crime are also influencing factors. To boost women's involvement in pond fish farming activities, policy and institutional support, monetary support, and extension support for women

should be increased [51]. Dissemination of training, education, information along with credit support, strong infrastructure, formatting groups for enhancing knowledge are all needed to empower Bangladeshi women for their direct engagement in aquaculture activities [52] strengthen rural enterprises, microcredit organizations, and input providers [55]. Women's participation in aquaculture could be improved by financial resources, human capital, and access to institutional and social provision and procedure, resulting in empowerment and enhanced livelihood status [57]. Gender equality, training, supportive programs, initiatives for capacity development will enable women's empowerment in aquaculture [58].

VII. CONCLUSION

After reviewing the literature, it was discovered that while women are invariably faced societal challenges, they still play a major role in diverse agricultural activities. They actively participate in post-harvesting activities of field crops production. Overall activities remain under control of women in homestead crops production. In case of poultry and livestock rearing as well as in fish culture, management activities are mostly performed by women. Women's participation in such activities improves socio-economic conditions, such as food security of households with improved family nutrition, additional family income, poverty mitigation, and employment opportunities, all of which contribute to sustaining lifestyles. Women's role in agricultural production is noteworthy which must be appreciated and valued.

CONFLICT OF INTEREST

Authors have declared that no competing interest exists.

REFERENCES

- [1] BBS (Bangladesh Bureau of Statistics), "Statistical year book of Bangladesh 2019," Statistics & Informatics Division (Sid), Ministry of Planning, Government of the People's Republic Of Bangladesh, Dhaka, Bangladesh., 2019.
- [2] BBS (Bangladesh Bureau of Statistics), "Statistical Yearbook of Bangladesh 2010," Statistics and Informatics Division (Sid), Ministry of Planning, Government of the People's Republic of Bangladesh., 2010.
- [3] World Bank, "Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate) - Bangladesh | Data." Available: <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=BD>.
- [4] R. Ahmad, "Women twice as active as men in farm activities," Dhaka Tribune, 2020. Available: <https://www.dhakatribune.com/bangladesh/agriculture/2020/12/03/women-twice-as-active-as-men-in-farm-activities>.
- [5] H. U. Ahmed, "Women's contribution to agriculture," The Financial Express. Available: <https://www.thefinancialexpress.com.bd/views/womens-contribution-to-agriculture-1535127549>.
- [6] B. Patil and V. S. Babus, "Role of women in agriculture," Int J Applied Res, vol. 4, no. 12, pp. 109–114, 2018.
- [7] T. Raney et al., "The role of women in agriculture," Food and Agriculture Organization of the United Nations, Agricultural Development Economics Division (ESA), 2011.
- [8] M. Ferdous, M. B. Uddin, and H. Kabir, "Women's Contribution in the Agriculture Sector of Bangladesh: Unveiling the Reality," International Journal of Science, Environment and Technology, vol. 6, no. 5, pp. 3110–3120, 2017.
- [9] S. Shifa, "Women in Bangladesh Agriculture: Scope, Determinants and Constraints," Bangbandhu Sheikh Mujibur Rahman Agricultural University, p. 23, 2018.
- [10] S. Anam, "Women's work: Unrecognised and undervalued," The Daily Star, 2016. Available: <https://www.thedailystar.net/supplements/25th-anniversary-special-part-4/womens-work-unrecognised-and-undervalued-212014>.
- [11] M. A. Hossain, "Socio-Economic Obstacles of Women Empowerment in Rural Bangladesh: A Study on Puthia Upazila of Rajshahi District," Research on Humanities and Social Sciences, vol. 1, no. 4, pp. 1–13, 2011.
- [12] E. Sraboni, A. R. Quisumbing, and A. U. Ahmed, "How empowered are Bangladeshi women in the agricultural setting? Empirical evidence using a new index," The Bangladesh Development Studies, vol. 37, no. 3, pp. 1–25, 2014.
- [13] S. Saifuddin, L. Dyke, and M. S. Hossain, "Walls all around: barriers women professionals face in high-tech careers in Bangladesh," Equality, Diversity and Inclusion: An International Journal, vol. 38, no. 7, pp. 705–726, 2019.
- [14] L. Aregu, A. Choudhury, S. Rajaratnam, C. Locke, and M. McDougall, "Gender norms and agricultural innovation: Insights from six villages in Bangladesh," Journal of Sustainable Development, vol. 11, no. 4, pp. 270–287, 2018.
- [15] M. Kabir, M. Radović Marković, and D. Radulović, "The determinants of income of rural women in Bangladesh," Sustainability, vol. 11, no. 20, p. 5842, 2019.
- [16] M. A. Islam, A. H. Jantan, A. Hunt, M. F. Rahman, and M. M. Abdullah, "Exploration of barriers faced by female graduate entrepreneurs in Bangladesh," Entrepreneurship and Sustainability Issues, vol. 7, no. 2, pp. 1000–1014, 2019.
- [17] P. K. Roy, S. Haque, A. Jannat, M. Ali, and M. S. Khan, "Contribution of women to household income and decision making in some selected areas of Mymensingh in Bangladesh," Progressive Agriculture, vol. 28, no. 2, pp. 120–129, 2017.
- [18] S. Rahman, "Women's employment in Bangladesh agriculture: composition, determinants and scope," Journal of Rural Studies, vol. 16, no. 4, pp. 497–507, 2000.
- [19] M. Jahan and J. R. Sarker, "Gender participation on rice post-harvest activities in Bangladesh," Journal of Environmental Science and Natural Resources, vol. 8, no. 1, pp. 45–50, 2015.
- [20] W. M. H. Jaim and M. Hossain, "Women's participation in agriculture in Bangladesh 1988–2008: Changes and determinants," in Preconference event on dynamics of rural livelihoods and poverty in South Asia, 7th Asian society of agricultural economists (ASAE) international conference, Hanoi, Vietnam, 2011, pp. 1–15.
- [21] J. Ferdous and D. Mallick, "Norms, practices, and gendered vulnerabilities in the lower Teesta basin, Bangladesh," Environmental Development, vol. 31, pp. 88–96, 2019.
- [22] M. Begum, T. Sultana, and I. B. Islam, "A Critical Overview on Women Entrepreneurship through Poultry farming in Bangladesh," Journal of Emerging Technologies and Innovative Research (JETIR), vol. 6, no. 6, pp. 888–896, 2019.
- [23] K. S. Farid, L. Mozumdar, M. S. Kabir, and U. K. Goswami, "Nature and extent of rural women's participation in agricultural and non-agricultural activities," Agricultural Science Digest, vol. 29, no. 4, pp. 254–259, 2009.
- [24] A. De Pinto, G. Seymour, E. Bryan, and P. Bhandari, "Women's Empowerment and Crop Diversification in Bangladesh," International Food Policy Research Institute, vol. 1849, 2019.
- [25] M. Rahman, "Role of agriculture in Bangladesh economy: uncovering the problems and challenges," International Journal of Business and Management Invention, vol. 6, no. 7, 2017.
- [26] A. Rasheed, G. E. Mwalupaso, Q. Abbas, X. Tian, and R. Waseem, "Women Participation: A Productivity Strategy in Rice Production," Sustainability, vol. 12, no. 7, p. 2870, 2020.
- [27] F. Rahman, S. A. Shammi, M. T. Parvin, N. Akter, M. S. Khan, and S. Haque, "Contribution of rural women to rice production activities in two different areas of Bangladesh," Progressive Agriculture, vol. 27, no. 2, pp. 180–188, 2016.
- [28] A. Roy, D. Z. Ethen, R. A. Z. Tama, and I. A. Begum, "Women labor participation in rice production in some selected areas of Thakurgaon district," Research in Agriculture Livestock and Fisheries, vol. 2, no. 2, pp. 239–246, 2015.
- [29] J. Ferdousy, M. R. Amin, M. A. Islam, and S. D. Baishakhy, "Rural women's participation in boosting homestead vegetable cultivation in Moulvibazar district," Asian Journal of Education and Social Studies, vol. 2, no. 3, pp. 1–9, 2018.

- [30] S. Rahman, "Women's labour contribution to productivity and efficiency in agriculture: empirical evidence from Bangladesh," *Journal of Agricultural Economics*, vol. 61, no. 2, pp. 318–342, 2010.
- [31] P. Schreinemachers et al., "The effect of women's home gardens on vegetable production and consumption in Bangladesh," *Food Security*, vol. 7, no. 1, pp. 97–107, 2015.
- [32] B. Roy and M. Rahman, "Status, diversity, and traditional uses of homestead gardens in Northern Bangladesh: A means of sustainable biodiversity conservation," *International Scholarly Research Notices*, vol. 2013 Article ID 124103, pp. 1–11, 2013.
- [33] S. Akhter, M. Alamgir, M. S. I. Sohel, M. P. Rana, S. M. Ahmed, and M. S. H. Chowdhury, "The role of women in traditional farming systems as practiced in homegardens: a case study in Sylhet Sadar Upazila, Bangladesh," *Tropical Conservation Science*, vol. 3, no. 1, pp. 17–30, 2010.
- [34] U. Kulsum, M. Rahman, and M. Hasan, "Participation of Rural Women in Homestead Agricultural Activities and Its Impact on Family Income: Evidence from Sadar Upazilla of Rangpur District in Bangladesh," *Journal of Science and Technology*, pp. 45–58, 2019.
- [35] M. A. Islam, M. B. Ahmed, and M. M. Islam, "Participation of rural women in activities related to homestead vegetable cultivation at Monirampur upazila under Jessore district," *Journal of the Bangladesh Agricultural University*, vol. 16, no. 1, pp. 17–22, 2018.
- [36] L. N. Mukta, Md. E. Haque, Md. A. Sadat, and Md. Z. Tareq, "Participation of Rural Women in Homestead Agricultural Activities," *Journal of Experimental Bioscience*, vol. 11, no. 2, pp. 55–66, 2020.
- [37] M. Nowshin Jahan, R. Islam, N. Monalesa, M. M. Abdullah, D. Das, and Z. Hasan, "Participation of Rural Women in Homestead Vegetable Cultivation of Nabinafar Upazila under Brahmanbaria District in Bangladesh," vol. 4, no. 3, pp. 221–225, 2016.
- [38] V. N. Bushamuka et al., "Impact of a homestead gardening program on household food security and empowerment of women in Bangladesh," *Food and nutrition bulletin*, vol. 26, no. 1, pp. 17–25, 2005.
- [39] M. Mamun-ur-Rashid and Q. Gao, "Rural women in livestock and fisheries production activities: an empirical study on some selected coastal villages in Bangladesh," *Asian Journal of Agriculture and Rural Development*, vol. 2, no. 393-2016–23883, pp. 658–667, 2012.
- [40] M. S. Islam, S. S. Islam, M. M. Islam, and M. M. Billah, "Exploring women participation in small-scale dairy farming: A case of Paikgachha upazila, Khulna, Bangladesh," *Asian Journal of Research in Animal and Veterinary Sciences*, vol. 3, no. 4, pp. 1–13, 2019.
- [41] M. M. Hasan, M. S. Kabir, and M. A. Kader, "Enhancing Resilience through Women Empowerment and Livestock Production in Selected Areas of Satkhira District of Bangladesh," *Journal of Entrepreneurship and Business Resilience (JEBR)*, vol. 3, no. 2, pp. 53–72.
- [42] M. S. Kabir, M. P. Moon, and R. Islam, "Women Participation in Integrated Dairy Farming and Household Food Security in Sirajganj District," *Specialty Journal of Humanities and Cultural Science*, vol. 4, no. 3, pp. 1–6, 2019.
- [43] S. Y. Y. Ikemoto, "Women's Empowerment through Small-Scale Dairy Farming in Selected Areas of Bangladesh," *Asian Social Science*, vol. 11, no. 26, pp. 290–301, 2015.
- [44] N. Islam, E. Ahmed, J. Chew, and B. D'Netto, "Empowerment factors of rural women through homestead poultry rearing in Bangladesh," *World Business Institute Australia*, pp. 1–15, 2016.
- [45] M. W. Rahman, R. N. Ali, and M. M. Hossain, "Women Involvement in Livestock and Poultry Raising in Some Selected Areas of Mymensingh District, Bangladesh," *Asia-Pacific Journal of Rural Development*, vol. 18, no. 2, pp. 119–132, 2008.
- [46] U. PAUL, "Attitude of rural women towards livestock rearing in magura sadar upazila," Ms thesis, Dept. of agricultural extension & information system, Sher-e-Bangla Agricultural University, 2016.
- [47] R. U. Mian, J. Fatema, and H. Rahman, "Impact of dairy farming on livelihood of participating women under Grameen Bank in a selected area of Rangpur District in Bangladesh," *Indian Journal of Agricultural Economics*, vol. 62, no. 902-2016–67385, pp. 259–271, 2007.
- [48] K. M. Rahman, M. J. Hossain, and M. S. Rana, "Livestock and poultry rearing by smallholder farmers in haor areas in Bangladesh: Impact on food security and poverty alleviation," *The Bangladesh Journal of Agricultural Economics*, vol. 41, no. 1, pp. 73–86, 2020.
- [49] BBS (Bangladesh Bureau of Statistics), "Statistical Yearbook of Bangladesh 2017," Statistics and informatics division (sid), Ministry of Planning, Government of the people's Republic of Bangladesh., 2017.
- [50] P. Sultana, P. M. Thompson, and M. Ahmed, "Women-led fisheries management-a case study from Bangladesh," *Global Symposium on Women in Fisheries*, 2002.
- [51] A. Quddus, N. Z. Jui, K. M. M. Rahman, and M. Rahman, "Gender Role in Pond Fish Culture in Terms of Decision Making and Nutrition Security," *Bangladesh Journal of Agricultural Economics*, vol. 38, no. 454-2018–4211, pp. 55–71, 2018.
- [52] S. S. Shirajee, M. M. Salehin, and N. Ahmed, "The changing face of women for small-scale aquaculture development in rural Bangladesh.," *Aquaculture Asia Magazine*, vol. 15, no. 2, pp. 9–16, 2010.
- [53] M. A. Rahman, J. Ferdous, and Z. Tasnim, "Role of women in pond fish farming and fish consumption situation in a selected area of Bangladesh," *Archives of Agriculture and Environmental Science*, vol. 4, no. 2, pp. 206–212, 2019.
- [54] M. H. Rahman, "A study on rural women's empowerment through participation in aquaculture," *Bangladesh Journal of Fisheries Research*, vol. 9, no. 1, pp. 73–76, 2005.
- [55] J. Das and M. S. Khan, "Women and Aquaculture in Bangladesh: The Unpaid Labour," *Bangladesh Sociological Society*, vol. 13, no. 1, p. 115, 2016.
- [56] F. YASMIN, "Role of women in aquaculture in Jamalpur district," Department of aquaculture, Bangladesh Agricultural University, 2011.
- [57] M. H. Rahman, "A study on rural women's empowerment through participation in aquaculture," *Bangladesh Journal of Fisheries Research*, vol. 9, no. 1, pp. 73–76, 2005.
- [58] A. Choudhury, C. McDougall, S. Rajaratnam, and C. M. Y. Park, "Women's empowerment in aquaculture: Two case studies from Bangladesh", *FAO*, Rome, 2017.