


FARMERS' ATTITUDES AND BARRIERS TOWARDS AGRICULTURAL DEVELOPMENT IN ASIR, SAUDI ARABIA

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ABSTRACT

The current study assesses farmers' attitudes and barriers towards agricultural development in Asir, Saudi Arabia. Simple random sampling was used to collect the data. Findings revealed that most respondents were interested in farm work. The majority of respondents have a positive attitude toward agricultural extension as a source of information. Spearman's rank-order correlation revealed a significant association between age and barriers to agricultural development. Education significantly correlated with farmers' attitudes toward agricultural activities. Main professions significantly correlated with farmers' attitudes and face barriers. Farming experience significantly correlated with farmers' attitudes. Land area significantly correlated with their attitudes and faced barriers. Therefore, it is suggested that educational programs, training, and workshops should be arranged in collaboration with the Ministry of Environment, Water, and Agriculture to reduce barriers to agricultural development in Saudi Arabia.

Keywords: Farmers, attitudes, agriculture, Saudi Arabia.

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1. INTRODUCTION

Agriculture plays a vital role in the economies of many countries, and agricultural sustainability must address issues of poverty alleviation, food security, and stable income generation for a rapidly growing population (Lee, 2005; Bhutto & Bazmi, 2007). The Arab world is struggling to transition to an agricultural-based economy, but the percentage of agricultural workers has declined from 23% in 2010 to 20% in 2015 (Arab Criticism, 2018). In 2023, Saudi Arabia grew a diverse range of 39 crops, including fruits, cereals, exposed vegetables, protected vegetables, and fodder, collectively covering a land area of 744,536 ha with a total production of 10,548,311 tons (MEWA, 2022). With great efforts, the Saudi government employed 7.2% of the workforce in different sectors (Al-Zahrani et al., 2018). However, Saudi Arabia faces significant challenges of water scarcity and climate change that hinder agricultural development (Al-Zahrani & Baig, 2011). In response to these issues, gradual optimisation of sustainable agriculture has become crucial. The farming system in Saudi Arabia heavily depends on irrigation, accounting for a significant portion of its water consumption (Haq & Khan, 2022). Unpredicted profit margin, high input costs, and unstable marketing of agricultural production are barriers to sustainable agricultural development (Alnafissa et al., 2024). These barriers may negatively affect farmers' behavior towards agricultural development. Low returns on agricultural investment due to high input costs or unstable markets could probably discourage farmers from making long-term investments in advanced agriculture (Abdelbaki & Alzahrani, 2024; Khan et al., 2025).

For instance, in China, farm size, educational level, investment power, technological incompatibility, low perceived value, high-risk perception, data security, low subsidies, and a lack of trust regarding the receipt of an output on an investment hinder the adoption of sustainable development (Clark et al., 2018). While in Italy, education, age, investment power, and farm size constitute barriers to sustainable development (Bucci et al., 2019). These barriers could cause unpredictable profit margins, high input costs, and unstable marketing of agricultural production, and may negatively affect farmers' behavior towards agricultural development. Low returns on agricultural investment due to high input costs or unstable markets could probably discourage farmers from making long-term investments in advanced agriculture (Abdelbaki & Alzahrani, 2024). The guaranteed agricultural income formulates positive attitudes toward sustainable agricultural practices and motivates farmers to contribute to agricultural development (O'Neill & Hanrahan, 2016).

The Saudi farming system is facing significant challenges due to an arid climate and water scarcity (Al-Zahrani & Baig, 2011). To address these issues, gradual optimization of cropping systems becomes crucial. The farming system in Saudi Arabia is heavily dependent on irrigation, accounting for a significant portion of its water

consumption (Haq & Khan, 2022). However, the country's water reservoirs are under high pressure due to population expansion, urbanization, and industrial development (Ghanim, 2019).

After investigating all barriers to agricultural development, the Saudi government provided financial assistance like grants, loans, incentives, technical assistance, training, and access to innovative technologies to farmers. Government of Saudi Arabia puts efforts into market development through awareness campaigns and collaboration with food industries and traders, which can be helpful in new crops market development. Awareness of agricultural practices improves adoption of recommended technologies and agricultural development (Muddassir & Alotaibi, 2023).

Farmers in Saudi Arabia use to get agricultural information through various sources such as brochures, booklets, leaflets, handouts, agricultural magazines, telephones, radio, television, extension meetings and seminars, farmers' fields visit, exhibitions, field demonstration, film/video movies, relatives and neighbors, agricultural companies and institutions (Al-Zahrani et al., 2016). Moreover, the Ministry of Environment, Water, and Agriculture (MEWA) Saudi Arabia introduced the "Agricultural Guide" application to offer extensive agricultural advisory services all over the country. In 2022, the application facilitated more than two million agricultural consultations across 64 different fields. In addition, around 233,000 farmers registered on the platform (Alsanhani et al., 2025). The current study assesses farmers' attitudes and barriers towards agricultural development in Asir Saudi Arabia.

2. MATERIALS AND METHODS

2.1. Data collection

The current was conducted in the Asir region, the southwestern part of Saudi Arabia. Simple random sampling was used to collect data. Methodological framework of the study is presented in Fig. 1. The data were collected through a structured paper-based questionnaire to achieve the research objectives. The questionnaire consisted of various sections, including socioeconomic characteristics of the respondents, farmers' attitudes toward farm work using a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). Sources of information were measured using a three-point Likert scale (1 = never; 2 = sometimes; 3 = always). The questionnaire was prepared in the local language to obtain accurate information. The questionnaire was distributed to 300 farmers; 272 returned complete questionnaires. Before data collection, a pilot study was conducted to analyze the validity and reliability of the Likert scale. For the pilot study, 30 farmers were selected, and data were analyzed to find out the Cronbach's Alpha, which represents the internal consistency of the scales used for the study. Findings showed $\alpha = 0.75$, which was acceptable for further research procedure. Moreover, researchers modified questionnaires based on findings of the pilot study.

2.2. Data Analysis

After final data collection, the Statistical Package for Social Sciences (SPSS v27) was used for analyzing the data. The descriptive analyses, including frequency, percentage, mean, and standard deviation, were run. Whereas in inferential analyses, Spearman's rank correlation was run.

3. RESULTS

Table 1 showed that the majority of farmers were between 45 and 63 years old. Only 22.7% of farmers were more than 63 years old. Regarding education, 33.6% of farmers held pre-primary to secondary education. More than three-fifths of farmers held college and university education. More than three-fifths of farmers were employed in government sectors. Whereas 22.7% and 11.8% of farmers were employed in private sector and farms respectively. More than three-fifths of farmers had less than 19 years of farming experience. Whereas 39.1% of farmers had 19 years to more than 34 years of farming experience. More than three-fifths of farmers owned less than 99 dunums to less than 181 dunums. Whereas 35% of farmers owned more than 181 dunums.

The data given in Fig. 2 shows that more than four-fifths of farmers are interested in farm work. Only 13% of them are not interested in agriculture (Fig. 2).

Table 2 presents farmers' attitudes toward farm work, arranged by mean score, ranging from 4.50 to 2.46. The statement "working in agriculture is worthy" ranked first by mean score (4.50). Whereas agriculture improved cash flow during the agricultural season, it ranked last according to the mean score (2.46). Table 3 shows that most farmers have a positive attitude toward farm work. Whereas 27.3% and 15.5% of the respondents have neutral and negative attitudes, respectively.

Table 4 shows farmers' attitudes toward agricultural information, with mean scores ranging from 2.54 to 1.34. The statement "farmers received information from neighbors" ranked first according to mean scores (2.54). Whereas farmers received information from TV and Radio ranked last according to mean score (1.34).

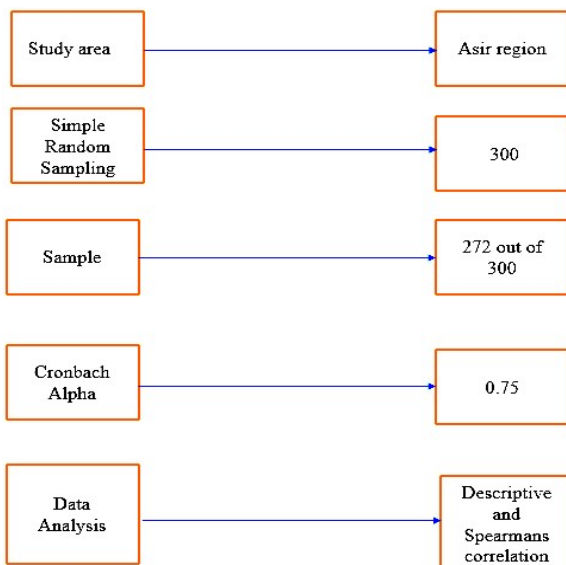


Fig. 1: Methodological framework.

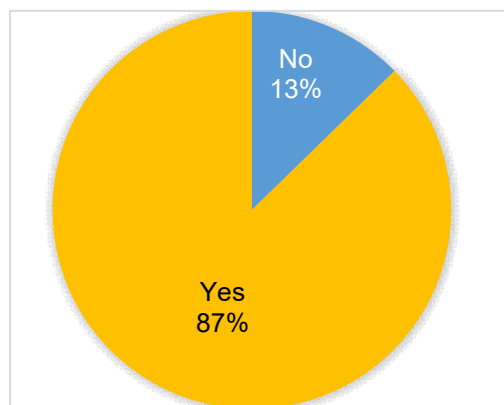


Fig. 2: Farmers' interest in farm work.

Table 1: Socioeconomic characteristics of the respondents

| Socioeconomic characteristics | % |
|-----------------------------------|------|
| Age | |
| Less than 45 | 30 |
| 45 to under 63 | 47.3 |
| More than 63 | 22.7 |
| Education | |
| Pre-primary | 4.5 |
| Primary | 10.9 |
| Secondary | 18.2 |
| College | 58.2 |
| University | 8.2 |
| Main profession | |
| Private Sector Employee | 11.8 |
| Government Sector Employee | 65.5 |
| Farms | 22.7 |
| Farming experience | |
| Less than 19 | 60.9 |
| 19 to less than 34 | 14.6 |
| More than 34 | 24.5 |
| Land area | |
| Less than 99 dunums | 14 |
| 99 dunums to less than 181 dunums | 51 |
| More than 181 dunums | 35 |

Table 5 shows farmers' attitudes toward agricultural extension as a source of information. The majority of the respondents have positive attitudes toward agricultural extension as a source of information. Whereas 33.6% and 8.2% of the respondents have neutral and negative attitudes, respectively.

Table 6 presents Spearman's rank-order correlation analysis, which was conducted to assess the relationships among respondents' demographic characteristics, attitudes, and barriers to agricultural development. Age was significantly correlated with barriers to agricultural development ($r = 0.234^*$, $P = 0.05$). This means that older farmers face more barriers to agricultural development than younger farmers. Education was significantly correlated with farmers' attitudes toward agricultural activities ($r = -0.372^{**}$, $P = 0.01$). This means that educated farmers have more negative attitudes toward agricultural activities than those with low levels of education.

Table 2: Farmers' attitudes toward farm work.

| Items | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | SD |
|---|-------------------|----------|---------|-------|----------------|------|------|
| | % | % | % | % | % | | |
| Working in agriculture is worthy | 0 | 3.6 | 8.2 | 22.7 | 65.5 | 4.50 | 0.85 |
| I prefer agricultural investment | 0 | 3.6 | 11.8 | 21.8 | 62.7 | 4.44 | 0.84 |
| Agriculture is an excellent profession | 0 | 3.6 | 8.2 | 41.8 | 46.4 | 4.31 | 0.78 |
| I prefer agriculture because it profitable investment | 7.3 | 3.6 | 11.8 | 30.9 | 46.4 | 4.06 | 1.18 |
| My income from agriculture is gradually increasing | 10.9 | 3.6 | 16.4 | 38.2 | 30.9 | 3.75 | 1.25 |
| Agriculture improved my living standard | 3.6 | 14.5 | 15.5 | 42.7 | 23.6 | 3.68 | 1.10 |
| Agriculture is laborious | 42.7 | 3.6 | 4.5 | 23.6 | 25.5 | 2.86 | 1.73 |
| Agriculture improved cash flow during the agricultural season | 43.6 | 0 | 30.9 | 18.2 | 7.3 | 2.46 | 1.39 |

Table 3: Overall farmers' attitudes towards farm work

| Degree of Directions | Number | Percentage |
|----------------------|--------|------------|
| Negative | 68 | 15.5 |
| Neutral | 120 | 27.3 |
| Positive | 252 | 57.2 |

Table 4: Farmers' attitudes toward sources of information among farmers

| Source of information | I don't use | Sometimes | Always | Mean | SD |
|--|-------------|-----------|--------|------|------|
| | % | % | % | | |
| Neighbors | 8.2 | 30 | 61.8 | 2.54 | 0.65 |
| How-to Bulletins | 11.8 | 33.6 | 54.5 | 2.43 | 0.70 |
| Social Media Platforms (Twitter) | 15.5 | 33.6 | 50.9 | 2.36 | 0.74 |
| Social Media Programs and Whatsapp | 15.5 | 33.6 | 50.9 | 2.36 | 0.74 |
| Relatives and friends | 8.2 | 52.7 | 39.1 | 2.31 | 0.62 |
| Fertilizer seller | 11.8 | 80.9 | 7.3 | 1.95 | 0.44 |
| Agricultural Extension Workers | 34.5 | 37.3 | 28.2 | 1.94 | 0.79 |
| Ministry of Environment, Water and Agriculture | 33.6 | 41.8 | 24.5 | 1.91 | 0.76 |
| Agricultural Cooperative Society | 40 | 56.4 | 3.6 | 1.64 | 0.55 |
| Tv | 70 | 26.4 | 3.6 | 1.34 | 0.55 |
| Radio | 70 | 26.4 | 3.6 | 1.34 | 0.55 |

Table 5: Overall farmers' attitudes toward sources of information among farmers

| Sources of information | Number | Percentage |
|------------------------|--------|------------|
| Negative | 36 | 8.2 |
| Neutral | 148 | 33.6 |
| Positive | 256 | 58.2 |

Main profession was significantly correlated with farmers' attitudes and face barriers ($r = 0.355^{**}$; 0.459^{**} , $P = 0.01$). This means that respondents who work full-time on farms hold positive attitudes toward agricultural activities and face fewer barriers to agricultural development than other professional holders. Farming experience was significantly correlated with farmers' attitudes ($r = 0.191^*$, $P = 0.05$). This means that respondents with high farming experience hold more positive attitudes toward agricultural activities than those with low farming experience. Land area significantly correlated with their attitudes and face barriers ($r = 0.204^*$; 0.237^* , $P = 0.05$). It means that larger landholders have improved positive attitudes toward agricultural activities and face fewer barriers to agricultural development than those who hold small land areas.

Table 6: Spearman's ranked correlation between independent and dependent variables

| Independent variables | Spearman's simple correlation coefficient | |
|-----------------------|---|--------------------------------------|
| | Farmer's Attitude towards Farm Work | Barriers to agricultural development |
| Age | 0.144 | 0.234* |
| Education | -0.372** | 0.036 |
| Main Profession | 0.355** | 0.459** |
| Years of Experience | 0.191* | 0.139 |
| Land area | 0.204* | 0.237* |

** Significance at a level of 0.01; * Significance at a level of 0.05.

4. DISCUSSION

This discussion addressed the interpretation of the study's most important findings by analyzing farmers' attitudes towards agricultural work, barriers to agricultural development, and the impact of socioeconomic characteristics on shaping these attitudes. The results showed that older farmers observed barriers to agricultural development. It might be based on their long experience in agriculture and having more knowledge about agricultural development and facing existing barriers in terms of high cost, low productivity (Muddassir et al., 2025). These findings are consistent with Alotaibi et al (2020) who found that older farmers with long experience observed several barriers to agricultural development. They further explained that older farmers might consider climate change as a barrier to agricultural development. It may affect agricultural costs and productivity (Alotaibi et al., 2025).

Attitudes by values, economic status, and social characteristics, as many farmers express pride in their heritage. They possess passion and a sense of accomplishment in their work, and they value their relationship with nature (Nataraju et al., 2019; Kantor, 2020; Fitrah, 2022; Nadeem, 2025). Education is considered as a part of demographic characteristics of the respondents. Regarding education, Low education builds negative attitudes toward farm work

(Unaeze et al., 2026). It is understandable that low education might not allow farmers to gain updated information. Muddassir et al. (2024) revealed that educated farmers have access to several sources of information and have more knowledge than low educated farmers. Similar findings by Velandia et al (2020) reported that education played a vital role in understanding and improving access to various sources of information.

Main profession also explains their farmer orientation towards agriculture as a form of self-employment that grants them a high degree of autonomy in decision-making, time management, and resource management without direct dependence on others. Autonomy is one of the strongest determinants that reinforces positive attitudes towards agriculture, especially in rural communities (Maican et al., 2021). Farmers who were full-time involved in agriculture showed positive attitudes toward farmwork and observed barriers to agricultural development. It seems realistic because they were completely dependent on agriculture and tried to understand more about agricultural development and interested in farm work. These farmers might own limited resources and be dependent on farm incomes and conscious about agricultural development and focus on barriers and try to mitigate barriers. Similar findings were reported by Sun et al. (2019), small farmers are more conscious and depend on limited land areas and incomes. It might build their attitudes towards agricultural development and their understanding of existing barriers to agricultural development. Overall, the results of this study are consistent with those found in studies conducted in India and other countries, which have shown that the majority of farmers have positive or moderate attitudes towards agricultural work due to their main profession, while some exhibit negative attitudes due to factors such as weak infrastructure, fragmented landholdings, or limited financial returns (Nataraju et al., 2019; Kantor, 2020; Mandal, 2020; Maican et al., 2021; Dabiah et al., 2025).

Farmers with high experience have a positive attitude toward farm work. It is logical that long farming experience improved concerns and attitudes. More experienced farmers tend to associate themselves with agriculture for stability and routine, while more educated individuals show less inclination towards traditional agricultural work due to the availability of other career alternatives (Deshmukh et al., 2020; Herab et al., 2022; Dinis, 2025). It can be expected that more experienced farmers might have various sources of information for agricultural development. At the social level, social capital, including experience, might play a crucial role in supporting continuity and fostering positive attitudes, particularly in areas such as trust, social networks, and interaction within the farming community. These networks facilitate the exchange of knowledge and experiences and contribute to the adoption of modern agricultural practices (Huber et al., 2024; Sander et al., 2024; Bogado et al., 2024). Cultural and familial factors also contribute to increased occupational commitment, especially in family farming systems.

Large landholders had positive attitudes toward farmwork and understood more barriers to agricultural development. At the economic level, evidence suggests that farm size, and resource availability are key factors in determining occupational trends. Greater resources increase feelings of capability and economic viability and attitudes toward farmwork, while financial pressures weaken the inclination to continue farming (Emragea, 2013; Maican et al., 2021). Farm size also influences motivation, as incentives and guidance increase satisfaction and commitment. Moreover, it improves attitudes toward farms and builds understanding of agricultural development (Mulya & Hudalah, 2024; Panigrahi et al., 2024; Mulya et al., 2025).

5. CONCLUSION

The current study assesses farmers' attitudes and barriers towards agricultural development in Asir, Saudi Arabia. The majority of the respondents were interested in farm work and had positive attitudes toward agricultural extension as a source of information. Age significantly correlated with barriers to agricultural development. Education significantly correlated with farmers' attitudes toward agricultural activities. Main profession was significantly correlated with farmers' attitudes and with the barriers they faced. Farming experience significantly correlated with farmers' attitudes. Land area was significantly correlated with their attitudes and with the barriers they faced. The study's findings have several implications. Extension educational programs, training, and workshops should be arranged in collaboration with the Ministry of Environment, Water, and Agriculture to reduce barriers to agricultural development in Saudi Arabia. The current study was limited to the Asir region; further study is suggested in other regions that are involved in agricultural activities.

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REFERENCES

- Abdelbaki, A. M., & Alzahrani, A. S. (2024). Gradually optimization of cropping pattern in Saudi Arabia for sustainable agricultural development until 2030. *Ain Shams Engineering Journal*, 15(4), 102624. <https://doi.org/10.1016/j.asej.2023.102624>
- Alnafissa, M., Alotaibi, B. A., Aldawdahi, N., Imran Azeem, M., & Muddassir, M. (2024). Optimizing animal care through compound feed management in Saudi Arabia. *Frontiers in Sustainable Food Systems*, 8, 1406715. <https://doi.org/10.3389/fsufs.2024.1406715>
- Alotaibi, B. A., Alshabr, K., & Muddassir, M. (2025). Farmers'awareness of desertification causes in Al-Aflaj, Saudi Arabia. *Agrociencia*, 1-15.
- Alotaibi, B. A., Kassem, H. S., Nayak, R. K., & Muddassir, M. (2020). Farmers' beliefs and concerns about climate change: an assessment from southern Saudi Arabia. *Agriculture*, 10(7), 253. <https://doi.org/10.3390/agriculture10070253>
- Alsanhani, A. N., Al-Shayaa, M. S., Dabiah, A. T., & Alfridi, J. S. (2025). Advancing Sustainable Agriculture Through Digital Technology: The Role of the 'Agricultural Guide'App in Improving Olive Farming Practices in Saudi Arabia. *Sustainability*, 17(6), 2340. <https://doi.org/10.3390/su17062340>
- Al-Zahrani, K. H., Aldosari, F. O., Baig, M. B., Shalaby, M. Y., & Straquadine, G. S. (2018). Assessing the competencies and training needs of agricultural extension workers in Saudi Arabia. *Journal of Agricultural Science and Technology*, 19, 33-46. <http://hdl.handle.net/123456789/3725>
- Al-Zahrani, K. H., & Baig, M. B. (2011). Water in the Kingdom of Saudi Arabia: sustainable management options. *The Journal of Animal & Plant Sciences*, 21(3), 601-604. ISSN: 1018-7081.
- Al-Zahrani, K. H., Aldosari, F. O., Baig, M. B., Shalaby, M. Y., & Straquadine, G. S. (2016). Role of agricultural extension service in creating decisionmaking environment for the farmers to realize sustainable agriculture in AL-qassim and Al-Kharj regions-Saudi Arabia. *Journal of Animal & Plant Sciences*, 26(4), 1063-1071.
- Bhutto, A. W., & Bazmi, A. A. (2007, November). Sustainable agriculture and eradication of rural poverty in Pakistan. In *Natural Resources Forum* (Vol. 31, No. 4, pp. 253-262). Oxford, UK: Blackwell Publishing Ltd.
- Bogado, A. C. S., Estrada-Carmona, N., Beillouin, D., Chéron-Bessou, C., Rapidel, B., & Jones, S. K. (2024). Farming for the future: Understanding factors enabling the adoption of diversified farming systems. *Global Food Security*, 43, 100820. <https://doi.org/10.1016/j.gfs.2024.100820>
- Bucci, G., Bentivoglio, D., Finco, A., & Belletti, M. (2019). Exploring the impact of innovation adoption in agriculture: how and where Precision Agriculture Technologies can be suitable for the Italian farm system?. In *IOP Conference Series: Earth and Environmental Science*, 275(1), 012004.
- Clark, B., Jones, G. D., Kendall, H., Taylor, J., Cao, Y., Li, W., & Frewer, L. J. (2018). A proposed framework for accelerating technology trajectories in agriculture: A case study in China. *Engineering Agriculture*, 5(4), 485-498. <https://doi.org/10.15302/J-FASE-2018244>
- Dabiah, A. T., Hasan Herab, A., Alotibi, Y. S., Shaman Alfridi, J., & Muddassir, M. (2025). Farmers' attitudes toward modern irrigation systems: a case study of the Republic of Yemen. *Frontiers in Sustainable Food Systems*, 9, 1556204. <https://doi.org/10.3389/fsufs.2025.1556204>
- Deshmukh, J. M., Dhawale, S. P., & Kanade, S. V. (2020). Relationship between profile of the farmers and their attitude towards sustainable agricultural practices. *Current Journal of Applied Science and Technology*, 39(6), 101-106. <https://doi.org/10.9734/cjast/2020/v39i630564>
- Dinis, I. (2025). Influence of Age, Gender, and Other Intrinsic Factors on Portuguese Family Farmers' Motivations for Short-Term Continuity. *European Countryside*, 17, 70-90.
- Emragea, M. (2013). A study of the impact of some personal, social and economic characteristics on farmers' attitudes towards Agricultural work in the regions of Wasta and Garnada in Jabal Al-Akhdar-Libya. *Fayoum Journal of Agricultural Research and Development*, 27(2), 14-28. <https://doi.org/10.21608/fjard.2013.194652>
- Fitrah, H. (2022). The role of sustainable agriculture practices and knowledge in shaping farmer attitudes and attachment to agriculture. *Journal of Administrative and Business Studies*, 9(1), 41-57. <https://doi.org/10.20474/jabs-8.1.6>
- Ghanim, A. A. J. (2019). Water-Resources-Crisis-in-Saudi-Arabia-Challenges-and-Possible-Management-Options-An-Analytic-Review. *International Journal of Environmental and Ecological Engineering*, 13 (2). <https://doi.org/10.5281/zenodo.2571928>

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- Haq, M. A., & Khan, M. Y. A. (2022). Crop water requirements with changing climate in an arid region of Saudi Arabia. *Sustainability*, 14(20), 13554. <https://doi.org/10.3390/su142013554>
- Herab, A., Al-Ghamdi, A., Alzahrani, K., Elhindi, K. M., Muddassir, M., & Kassem, H. S. (2022). A framework for quantifying the strength of partnerships between agricultural cooperatives and development actors: a case study in Saudi Arabia. *International Journal of Environmental Research and Public Health*, 20(1), 364. <https://doi.org/10.3390/ijerph20010364>
- Huber, R., Kreft, C., Späti, K., & Finger, R. (2024). Quantifying the importance of farmers' behavioral factors in ex-ante assessments of policies supporting sustainable farming practices. *Ecological Economics*, 224, 108303. <https://doi.org/10.1016/j.ecolecon.2024.108303>
- Kantor, H. (2020). Locating the Farmer: Ideologies of Agricultural Labor in Bihar, India. *Anthropology of Work Review*, 41, 97-107. <https://doi.org/10.1111/awr.12208>
- Khan, H. S., Mathavan, B., Khan, S. U., Li, S., Dabiah, A. T., Muddassir, M., & Hua, L. (2025). Balancing productivity and sustainability: evaluating harmful agricultural practices and regulatory responses on climate resilience in the Yellow River Basin, China. *Frontiers in Sustainable Food Systems*, 9, 1669386. <https://doi.org/10.3389/fsufs.2025.1669386>
- Lee, D. R. (2005). Agricultural sustainability and technology adoption: Issues and policies for developing countries. *American Journal of Agricultural Economics*, 87(5), 1325-1334. <https://doi.org/10.1111/j.1467-8276.2005.00826.x>
- Maican, S., Muntean, A., Paștiu, C., Ștepieș, S., Polcyn, J., Dobra, I., Darja, M., & Moisă, C. (2021). Motivational Factors, Job Satisfaction, and Economic Performance in Romanian Small Farms. *Sustainability*, 13, 5832. <https://doi.org/10.3390/su13115832>
- Mandal, T. K., & Alam, S. (2020). Measuring the Attitude of the Farmers towards Agriculture as a Profession. *Indian Journal of Pure & Applied Biosciences*, 8(5), 47-50. <http://dx.doi.org/10.18782/2582-2845.8365>
- Ministry of Environment Water and Agriculture (2022). Ministry of Environment Water and Agriculture of Saudi Arabia statistical report <https://www.mewa.gov.sa/en/Ministry/initiatives/SustainableDevelopment/Pages/default.aspx>
- Muddassir, M., & Alotaibi, B. A. (2023). Farmers' awareness of improved maize cropping practices in Punjab, Pakistan. *International Journal of Agriculture and Biosciences*, 12(1), 8-17. <https://doi.org/10.47278/journal.ijab/2022.039>
- Muddassir, M., Alotaibi, B. A., & Azeem, M. I. (2024). Willingness to adopt biodegradable mulch among farmers in Saudi Arabia: implications for agricultural extension. *Frontiers in Sustainable Food Systems*, 8, 1423136. <https://doi.org/10.3389/fsufs.2024.1423136>
- Muddassir, M., Alotaibi, B. A., & S-Aljohani, E. (2025). Farmers' Perceptions of Environmental Risks and Barriers to Agricultural Plastic Waste Management in Al-Kharj Governorate, Saudi Arabia. *Sustainability*, 17(4), 1691. <https://doi.org/10.3390/su17041691>
- Mulya, S., & Hudalah, D. (2024). Urbanization pressure and farmers' attitudes: implications for agricultural sustainability. *Environment, Development and Sustainability*. 1-34. <https://doi.org/10.1007/s10668-024-05150-y>
- Mulya, S., Hudalah, D., & Prilandita, N. (2025). Farmers' Attitudes toward Urbanization Pressure for Agriculture Sustainability. *AGRARIS: Journal of Agribusiness and Rural Development Research*, 11(1), 19-39. <https://doi.org/10.18196/agraris.v11i1.513>
- Nadeem, F. (2025). Analyzing barriers to the adoption of soil sampling technology: A study of farmer awareness and socio-economic constraints in the cotton-wheat belt of Punjab, Pakistan. *Plant Crop Letters*, 2, 37-44. <https://doi.org/10.65822/j.pcl/20>
- Nataraju, M. S., Lakshminarayan, M. T., & Lalitha, K. C. (2019). Attitude of Farmers towards Agriculture. *International Journal of Current Microbiology and Applied Sciences*, 8(1), 2319-7706. <https://doi.org/10.20546/ijcmas.2019.801.288>
- O'Neill, S., & Hanrahan, K. (2016). The capitalization of coupled and decoupled CAP payments into land rental rates. *Agricultural Economics*, 47(3), 285-294. <https://doi.org/10.1111/agec.12229>
- Panigrahi, R., Panigrahi, R., Singh, N., & Shrivastava, A. (2024). Strategic Planning for Workplace Motivation and Engagement: Exploring Personal and Economic Factors in the Indian Agriculture Sector. *Journal of Operations and Strategic Planning*, 7, 141-159. <https://doi.org/10.1177/2516600X241283525>
- Sander, A., Ghazoul, J., Finger, R., & Schaub, S. (2024). Participation in individual and collective agri-environmental schemes: A synthesis using the Theory of Planned Behaviour. *Journal of Rural Studies*, 107, 103255. <https://doi.org/10.1016/j.jrurstud.2024.103255>
- Sun, X., Hu, Z., Li, M., Liu, L., Xie, Z., Li, S., Wang, G., & Liu, F. (2019). Optimization of pollutant reduction system for controlling agricultural non-point-source pollution based on grey relational analysis combined with analytic hierarchy process. *Journal of Environmental Management*, 243, 370-380. <https://doi.org/10.1016/j.jenvman.2019.04.089>
- Unaeye, C. H., Iwuoha, G. C., & Okere, G. C. (2026). Assessment of adaptation practices used by maize-based farmers in Mbaitolu L.G.A., Imo State, Nigeria. *Plant Crop Letters*, 5, 39-47. <https://doi.org/10.65822/j.pcl/2026.03>
- Velandia, M., Rejesus, R., Clark, C., Delong, K. L., Wszelaki, A., Schexnayder, S., & Jensen, K. (2020). Evaluating the relationship between fruit and vegetable growers use of plastic biodegradable mulches, and environmental stewardship and labor savings: the case of Tennessee fruit and vegetable farmers. *Sustainability*, 12, 2075. <https://doi.org/10.3390/su12052075>