BKAP532
[1-6]

REVIEW ARTICLE Bhartiya Krishi Anusandhan Patrika, Volume Issue : ()

Farmers' Wellbeing: A Scoping Review of Psychological and Social Wellbeing of Farming Community

Anubhav Beniwal, Aditi Mathur

10.18805/BKAP532

ABSTRACT

Many developed nations and developing countries are experiencing a decline in the number of farmers and people are no longer interested in pursuing farming practices. There are many physical and biological risks associated with farming environments, which are universal across cultures. Due to this, it is pertinent to consider the psychological and social well-being of farmers from a global perspective. This review followed the preferred reporting items for reviews and meta-analysis extension for scoping reviews (PRISMA-ScR). The findings of this study suggest that farming communities are not in harmony with occupations and society. As a result, they face inequality in gender participation in farming practices. Mental health issues and a decline in willingness to participate in farming create a need to find alternative sources of income.

Key words: Masculinity, Mental health, Mind-set, Stress, Women.

Institute of Agri Business Management, Bikaner-334 006, Rajasthan, india.

Corresponding Author: Anubhav Beniwal, Institute of Agri Business Management, Bikaner-334 006, Rajasthan, india.
Emai: anubhav.iabm@gmail.com

How to cite this article: Beniwal, A. and Mathur, A. (2022). Farmers' Wellbeing: A Scoping Review of Psychological and Social Wellbeing of Farming Community. Bhartiya Krishi Anusandhan Patrika. DOi: 10.18805/BKAP532.

Submitted: 12-05-2022 **Accepted:** 27-12-2022 **Online:** 30-12-2022

Farming is under practiced since ancient times on this planet. Earlier it was considered an approach to fulfilling the basic need of hunger but now it is just an occupation that is perceived as one of the most stressful and uncertain occupations in the world (Roy *et al.* 2017). And, this can be observed in many developed and developing countries. Peoples are no longer interested to continue with farming practices and the number of farmers is declining every year, as per international labour organization data people who work in agriculture has declined from 44% to 26% (1991-2020) Booth (2020). Countries like the USA during 1935-2020 faced a decline of around 4.8 million farmers Kassel (2021). furthermore china faced a decline of 275 million farmers Hays (2013). India also faced a decline of around 15 million farmers since 1991 N. (2013). This declining trend is due to unpredictable weather (temperature, rainfall, *etc*.), outbreaks of pests and diseases, continuously decline in soil fertility and use of unconscionable agrochemicals Jamail (2011), access to information, lack of credit, negative perception about farming (I.F.A.D. 2016) and surety of regular non-agriculture based income Mahapatra (2020). The trend has also changed the mind-set of young generation not to choose agriculture as a career. The increasing population and declining numbers of farmers is a controversial situation. And, it's a challenge for almost every country in the world (R. 2017).

Although the farming practices, production systems and forms of farms are diverse due to geographical and economic conditions, there are common practices across the farms (Lowder *et al.* 2016). Most farms in India as well as around the world continue to be family-owned and exposed to market fluctuations (demand and supply), unstable commodity market, growing cost of machinery and production, weather variability, high chance of crop failure and impact of government decisions (Behere *et al.* 2009). Farming environments are characterized by a diverse and changing variety of physical (Morton 2007) and biological risks that are universally applicable throughout cultures (Pingali 2012). As a result, it is important to consider the psychological and social well-being of farmers from a global perspective.

Wellbeing is a broad term and includes various aspects like physical, psychological and social wellbeing. WHO has also defined health as "a state of complete physical, social and psychological well-being and not merely the absence of disease or infirmity?" The all-around well-being of a human being is sprinted on these aspects of life to ensure balance and growth in every dimension of life Ramirez (2021, December 30). Psychological and Social well-being is an outcome of the following contributing factors:

Earlier researches like Ryff (2014) examined how much people believed their lives had direction and meaning (purpose in life); whether they believed they were living according to their own personal convictions (autonomy); how much they were utilising their unique talents and potential (personal growth); how well they were handling their daily situations (environmental mastery); and the degree of connection they had in relationships with significant others (positive rela (self-acceptance) and these were found meaningfully impactful around the people. Furthermore, within

social environment, acceptance, attachment, belongingness and motivation are also playing a key role for connectivity and resistance from adverse circumstances (Fig 1).

In this paper, the main focus is laid on addressing the psychological and social well-being of farming community. Because this community is in distress for a long time and now it is affecting the decisions of the upcoming generation Rudolphi *et al.* (2020). Three main pillars of farming community belong to farmer themselves, farmworkers and women.

This review followed the preferred reporting items for reviews and meta-analysis extension for scoping reviews (PRISMA-ScR) and Daghagh Yazd *et al.* (2019) guidelines namely: (1) identification of literature, (2) Screening questions and (3) eligibility criteria.

Identification of literature

To identify appropriate literature we have searched through online method until 2020. Electronic database like Google scholar has been used by searching with keywords: "farming community" OR "farming community well-being" OR "psychological well-being" OR "social Well-being" OR "farmworkers" OR "farm women" OR "mental health" OR "farmer suicide".

Screening questions

Initially title, abstract and keywords were screened then the selected articles were screened with the following questions:

1. Are farmers or farmworker or farm women included as the target population?
2. Are any kind of well-being and its related problems pointed in the study?

Eligibility assessment

Following inclusion criteria were then applied-

1. Does the study discuss in detail farmers/farm workers/ farm women mental health?
2. Does the study is in detail about suicide, stress, depression in farming community?
3. Does the study discuss any kind of help to cope with adverse situations?

Following study was carried out in Institute of Agri Business Management and this study has been conducted during January- May 2022.

Farming is known as a risky and stressful occupation. At the same time, men are a symbol of a strong, traditional or hegemonic form of masculinity based on stoicism, resourcefulness and resilience to adversity (Roy *et al*. 2017). And, it is contradictory in itself between social representation and health. Health behaviours are best understood as social practices by which a farmer can demonstrate their level of conformity or resistance towards traditional masculinity norms that holds a dominant position among discourses of masculinity (Roberston 2007).

Traditional norms advise that men are the alignment provider and protectors of their families and should only involve with health services when it is strongly recommended by nearby people. Then there is a contradiction experienced by the farmers who struggled with the social pressure to present themselves as intense and relentless workers yet who also recognized the pressure exerted (by farming peers) to live up to such an image (Roy *et al*. 2017). And, it leads towards a range of physical and psychological health challenges because of hard work and challenging conditions of on-farm and off-farm environments (Fraser *et al.* 2005). Several mental health studies found out that climate change, drought, work overload, debt, price uncertainty, financial pressure and difficulties with the fulfilment of basic needs are common risk factors (Mcshane *et al.,* 2016; Mora *et al*., 2016; Logstein 2016; Ramos *et al.*, 2015; Carvajal *et al.*, 2014; Wheeler *et al.*, 2018).

Pesticide exposure

Reviews studies have found a positive relation between pesticide contact and mental health problems. It directly affects the neural system that causes mental illness (Malekirad *et al.*, 2013; Corral *et al.*, 2017; Muñoz-Quezada *et al*., 2017) and depression (Weisskopf *et al*., 2013; Kim *et al*., 2013; Atreya *et al*., 2012; Harrison *et al*., 2016; da Silva *et al*., 2016; Siegel *et al*., 2017; Conti *et al*., 2018) (Fig 2).

Financial issues

Financial pressure is reported as one of the main factors, especially when farming is the only source of income (Kallioniemi *et al*., 2016; Das *et al*., 2011; Eberhardt *et al*., 1990). Financial problem is reported due to various reasons like; increase in input price, the market price of commodity/

Psychological Well-Being
Self-Acceptance
Personal Growth
Purpose of Life
Environmental Mastery
Autonomy
Positive relation with others

Social Well-Being
Social Acceptance
Attachment
Need for Belongingness
Social Integration
Relation Motivation

Fig 1: Factors contributing for psychological and social well-being.

livestock, debt, repaying capacity and lack of affordable health services (Kearney *et al*., 2014; Dohlman, 2020). Along with this, it has been found that higher profit is positively related to farmers' well-being and less distressing life (Peel *et al*. 2015) (Fig 2).

Weather uncertainty

Weather is dynamic in nature. And, this constant change plays an important role in farming because farming is all about how nature nourishes the plants. Earlier research predicted that the twenty-first century will face an increased risk of recurring droughts (Dai 2013). Drought has been perceived as a slow-moving disaster that leads to challenging economic and social pathways such as loss of livelihood, diminished social support, migration and education of children (King *et al*., 2009; Vins *et al*., 2015; Udmale *et al*., 2014). Recurring Drought has affected the freshwater availability and distribution for everyone as well as in agriculture that resulting in declined production, crop loss, livestock production failure, high temperature, change in monsoon, exploitation of groundwater (Udmale *et al*., 2014; Berry *et al*., 2008; Ashraf *et al*., 2013; Adhikari 2018). Studies reported that drought and stress have a positive relationship that is visible through a high level of psychological morbidity and financial hardship (Kureshi *et al*., 2018; Stain *et al.,* 2011; Acharibasam *et al*., 2018). Along with this summer heat waves also affects the prevalence and severity of farmers' health due to no other option farmers' have to work in any condition (Singh *et al*. 2015) (Fig 2).

Poor physical health

Farming is one of the worst affected occupations in terms of physical injury and illness (May *et al*., 2020; Davis *et al*., 2007). Farmers and farmworkers every day spend a big amount of time at the farm that's why getting injured at worksite is not surprising. Along with this high body mass and sleep deprivation were found associated with injury and depression Hawes *et al*., (2019). As per the research outcome, somatic symptom disorder (SSD) is highly prevalent among farmers DeArmond *et al*. (2006), it exists when a person feels nervousness about physical indications such as pain and is related to depression (Fig 2).

According to a study, farmers, consistent with their social image as resourceful men, have developed a variety of coping strategies to maintain their well-being and to prevent mental health problems (Fig 3) (Roy *et al*. 2017).

Women also play a pivotal role in farming as face many issues related to participation on daily basis. Men and women struggle with stress differently with women experiencing stress not just due to the day-to-day farming activities, but also due to the impacts of the day-to-day farming activities on the physical, social and financial wellbeing of the entire family. Many times women have to take responsibility both on and off the farm which indirectly helps in ensuring the financial stability of a family. Women usually engage in farm roles, such as labour/manager and household duties (Mulder *et al*., 2000; Carruth *et al*., 2002). Few research found out the role conflict among and absence of husband support. Overall In general, women farmers have stated more mental distress than men (Lee *et al*., 2019; Hanklang *et al*., 2016). Women farmers' mental health is often associated with exposure to pesticides, economic hardship and financial worry, similar to male farmers. And usually, women engage themselves in farm activities to reduce the burden of laid labour.

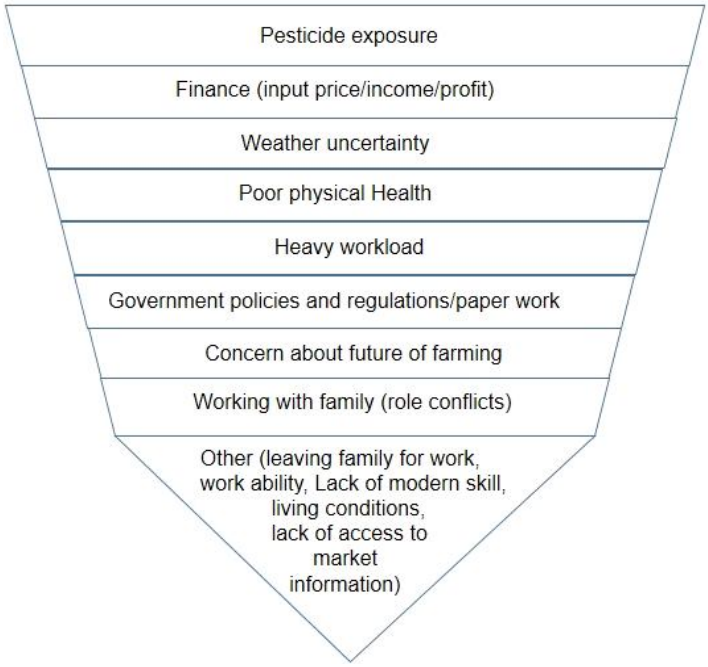

Fig 2: Key risk factors accountable for farmer mental health.

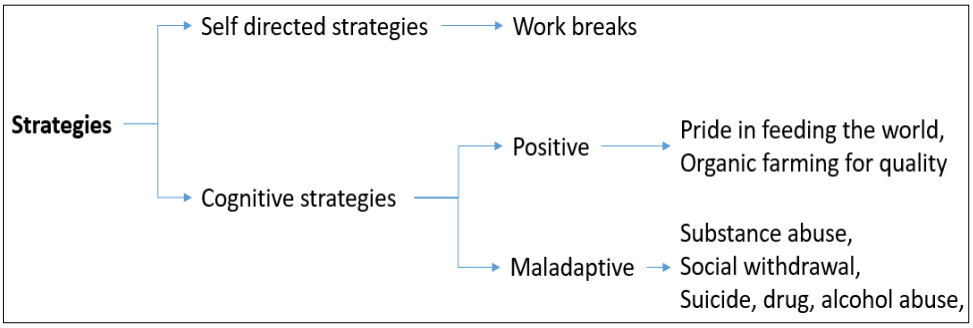

Fig 3: Types of strategies to maintain well-being.

Farmworkers are mainly categorized into seasonal and migrant farm workers. As a result of the hazardous conditions at the farm, farmworkers are categorised separately into a class that has poor occupational health and high rates of workplace injuries, illnesses and fatalities (Arcury *et al*., 2007; Arcury *et al*., 2012). Farmworkers have a high rate of exposure towards anxiety, depression, alcohol and drug abuse and overall poor mental health. It is also felt by farmworkers that unequal access to basic health facilities is nothing less than social injustice. Additionally, farmworkers faced economic disadvantages with limited access to health insurance, low education and sub-standard living conditions due to financial difficulties (Chaney *et al*. 2017).

Help-seeking behavior is also important as a coping strategy because it's an active search for relief to fulfil a need and it complex decision-making process for a person who is actually suffering. Usually, lack of knowledge of helping sources or the belief that a person should deal with his/her problems alone were major obstacles for help-seeking behavior (Brew *et al*., 2016; Wang *et al*., 2017).

The objective of this study was to systematically review relevant research (n=70) in order to enlighten the psychological and social wellbeing problems of farming community around the world. Studies that were considered had used several assessment tools most of them were quantitative in nature and were undertaken within the last 12 years.

Studies indicate that farming populations suffer from high rates of mental disorders. It is also important to consider that there is mixed evidence regarding whether farming has worse mental health than other occupations and also women than men, although a larger portion of studies found that farmers and farmworkers experienced more psychological health problems than non-farmers. Climate variability, rainfall deficiency and severe recurring drought across the world are parts of the agroecosystem that needs to be further explored in the future.

However, despite providing useful information for understanding farmers, farmworkers and farm women's mental and social health issues, this study has some limitations. Identifying connection of risk factors and help-seeking behavior with mental health and coping strategies also needs cautious consideration.

CONCLUSION

Findings of this review indicate that mental health issues of farming communities are a complex interaction between economic, social and environmental factors. The most cited responsible factors for mental health-related issues are pesticide exposure, crop failure and weather uncertainty. Thus, future policies need to lead emphasis on solving various mental health and social issues of the farming community in terms of finance, health services, insurance and connecting society. Further research is required to address and solve issues related to individual behavior, social response to help seekers and farm operational difficulties.

REFERENCES

Acharibasam, J.W. and Anuga, S.W. (2018). Psychological distance of climate change and mental health risks assessment of smallholder farmers in Northern Ghana: Is habituation a threat to climate change? Climate Risk Management. 21: 16-25.

Adhikari, S. (2018). Drought impact and adaptation strategies in the mid-hill farming system of western Nepal. Environments. 5(9): 101. https://doi.org/10.3390/environments5090101.

Arcury, T.A. and Quandt, S.A. (2007). Delivery of health services to migrant and seasonal farmworkers. Annu. Rev. Public Health. 28: 345-363.

Arcury, T.A., O'Hara, H., Grzywacz, J.G., Isom, S., Chen, H. and Quandt, S.A. (2012). Work safety climate, musculoskeletal discomfort, working while injured and depression among migrant farmworkers in North Carolina. American Journal of Public Health. 102(S2): S272-S278.

Ashraf, M. and Routray, J.K. (2013). Perception and understanding of drought and coping strategies of farming households in north-west Balochistan. International Journal of Disaster Risk Reduction. 5: 49-60.

Atreya, K., Kumar, S.B., Overgaard, H., Man, B.R. and Sharma, S. (2012). Knowledge, attitude and practices of pesticide use and acetylcholinesterase depression among farm workers in Nepal. International Journal of Environmental Health Research. 22(5): 401-415.

Behere, P.B. and Bhise, M.C. (2009). Farmers' suicide: Across culture. Indian Journal of Psychiatry. 51(4): 242-243. DOI: 10.4103/0019-5545.58286.

Berry, H.L., Kelly, B.J., Hanigan, I.C., Coates, J.H., McMichael, A.J., Welsh, J.A. and Kjellstrom, T. (2008). Rural Mental Health Impacts of Climate Change. Commissioned Report for the Garnaut Climate Change Review. Canberra: The Australian National University.

Booth, A. (2020). The reason we're running out of farmers. BBC. https://www.bbc.com/future/bespoke/follow-the-food/the-reason-we-are-running-out-of-farmers/

Brew, B., Inder, K., Allen, J., Thomas, M. and Kelly, B. (2016). The health and wellbeing of Australian farmers: A longitudinal cohort study. BMC Public Health. 16(1): 1-11.

Carruth, A.K. and Logan, C.A. (2002). Depressive symptoms in farm women: Effects of health status and farming lifestyle characteristics, behaviors and beliefs. Journal of Community Health. 27(3): 213-228.

Carvajal, S.C., Kibor, C., McClelland, D.J., Ingram, M., de Zapien, J.G., Torres, E. and Rosales, C. (2014). Stress and sociocultural factors related to health status among US-Mexico border farmworkers. Journal of Immigrant and Minority Health. 16(6): 1176-1182.

Chaney, B.H. and Torres, E. (2017). Covariates of identified stress and depression among seasonal farmworkers. International Journal of Environmental Research and Public Health. 14(7): 711. doi: 10.3390/ijerph14070711.

Conti, C.L., Barbosa, W.M., Simão, J.B.P. and Álvares-da-Silva, A.M. (2018). Pesticide exposure, tobacco use, poor self-perceived health and presence of chronic disease are determinants of depressive symptoms among coffee growers from Southeast Brazil. Psychiatry Research. 260: 187-192.

Corral, S.A., de Angel, V., Salas, N., Zúñiga-Venegas, L., Gaspar, P.A. and Pancetti, F. (2017). Cognitive impairment in agricultural workers and nearby residents exposed to pesticides in the Coquimbo Region of Chile. Neurotoxicology and Teratology. 62: 13-19.

Da, S.V.D.S.P., de Mello, M.S.C. and Otero, U.B. (2016). Exposure to pesticides and mental disorders in a rural population of Southern Brazil. Neurotoxicology. 56: 7-16.

Dai, A. (2013). Increasing drought under global warming in observations and models. Nature Climate Change. 3(1): 52-58.

Daghagh, Y.S., Wheeler, S.A. and Zuo, A. (2019). Key risk factors affecting farmers' mental health: A systematic review. International Journal of Environmental Research and Public Health. 16(23): 4849. https://doi.org/10.3390/ijerph16234849.

Das, A. (2011). Farmers' suicide in India: Implications for public mental health. International Journal of Social Psychiatry. 57(1): 21-29.

Davis, K.G. and Kotowski, S. E. (2007). Understanding the ergonomic risk for musculoskeletal disorders in the United States agricultural sector. American Journal of Industrial Medicine. 50(7): 501-511.

DeArmond, S.E., Stallones, L., Chen, P.Y. and Sintek, E.E. (2006). Depression and somatic symptoms within the farming community. Journal of Agricultural Safety and Health. 12(1): 5-15.

Dohlman, E. (2020). USDA ERS - Risk in Agriculture. Economic Research Service. https://www.ers.usda.gov/topics/farm-practices-management/risk-management/risk-in-agriculture.

Eberhardt, B.J. and Pooyan, A. (1990). Development of the farm stress survey: Factorial structure, reliability and validity. Educational and Psychological Measurement. 50(2): 393-402.

Fraser, C.E., Smith, K.B., Judd, F., Humphreys, J.S., Fragar, L.J. and Henderson, A. (2005). Farming and mental health problems and mental illness. International Journal of Social Psychiatry. 51(4): 340-349.

Hanklang, S., Kaewboonchoo, O., Morioka, I. and Plernpit, S.A. (2016). Gender differences in depression symptoms among rice farmers in Thailand. Asia Pacific Journal of Public Health. 28(1): 83-93.

Harrison, V. and Ross, S.M. (2016). Anxiety and depression following cumulative low-level exposure to organophosphate pesticides. Environmental Research. 151: 528-536.

Hawes, N.J., Wiggins, A.T., Reed, D.B. and Hardin Fanning, F. (2019). Poor sleep quality is associated with obesity and depression in farmers. Public Health Nursing. 36(3): 270-275.

Hays, J. (2013). Agriculture In China: Challenges, Shortages, Imports and Organic Farming | Facts and Details. https://factsanddetails.com/china/cat9/sub63/item348.html#:%7E:text=Chinese %20 Farmers, -About % 20 35% 20 percen tandtex t=There % 20are%2 0425%20m illion% 20 agricultural, 60%20 per cent % 20 of %20 the % 20 population.

I.F.A.D. (2016). Why are rural youth leaving farming? - Office of the Secretary-General's Envoy on Youth. Un.Org. https://www.un.org/youthenvoy/2016/04/why-are-rural-youth-leaving-farming/.

Jamail, D. (2011). The decline of agriculture? Environment | Al Jazeera. https://www.aljazeera.com/features/2011/7/4/the-decline-of-agriculture.

Kallioniemi, M.K., Simola, A., Kaseva, J. and Kymäläinen, H.R. (2016). Stress and burnout among Finnish dairy farmers. Journal of Agromedicine. 21(3): 259-268.

Kassel, K. (2021). The number of U.S. farms continues to decline slowly. Economic Research Service. https://www.ers.usda.gov/data- products/chart-gallery/gallery/chart-detail/?chartId=58268.

Kearney, G.D., Rafferty, A.P., Hendricks, L.R., Allen, D.L. and Tutor-Marcom, R. (2014). A cross-sectional study of stressors among farmers in eastern North Carolina. North Carolina Medical Journal. 75(6): 384-392.

Kim, J., Ko, Y. and Lee, W.J. (2013). Depressive symptoms and severity of acute occupational pesticide poisoning among male farmers. Occupational and Environmental Medicine. 70(5): 303-309.

King, D., Lane, A., MacDougall, C. and Greenhill, J. (2009). The resilience and mental health and wellbeing of farm families experiencing climate variation in South Australia: Final Report.

Kureshi, J.S. and Somasundaram, K.V. (2018). Assessment of occupational stress among farmers in Aurangabad district, Maharashtra. International Journal of Community Medicine and Public Health. 5(4): 1434-1440.

Lee, H., Cho, S.Y., Kim, J.S., Yoon, S.Y., Kim, B.I., An, J.M. and Kim, K.B. (2019). Difference in health status of Korean farmers according to gender. Annals of Occupational and Environmental Medicine. 31(1): 1-9.

Logstein, B. (2016). Farm-related concerns and mental health status among Norwegian farmers. Journal of Agromedicine. 21(4): 316-326.

Lowder, S.K., Skoet, J. and Raney, T. (2016). The number, size and distribution of farms, small holder farms and family farms worldwide. World Development. 87: 16-29.

Mahapatra, R. (2020). India's agrarian distress: Is farming a dying occupation. TOI. https://www.downtoearth.org.in/news/agriculture/india-s-agrarian-distress-is-farming-a-dying-occupation-73527.

Malekirad, A.A., Faghih, M., Mirabdollahi, M., Kiani, M., Fathi, A. and Abdollahi, M. (2013). Neurocognitive, mental health and glucose disorders in farmers exposed to organophosphorus pesticides. Archives of Industrial Hygiene and Toxicology. 64(1): 1-8.

May, J.J. and Arcury, T.A. (2020). Occupational injury and illness in farmworkers in the eastern United States. Latinx Farmworkers in the Eastern United States. 41-81.

McShane, C.J., Quirk, F. and Swinbourne, A. (2016). Development and validation of a work stressor scale for A ustralian farming families. Australian Journal of Rural Health. 24(4): 238-245.

Mora, D.C., Quandt, S.A., Chen, H. and Arcury, T.A. (2016). Associations of poor housing with mental health among North Carolina Latino migrant farmworkers. Journal of Agromedicine. 21(4): 327-334.

Morton, J.F. (2007). The impact of climate change on smallholder and subsistence agriculture. Proceedings of the National Academy of Sciences. 104(50): 19680-19685.

Mulder, P.L., Kenkel, M.B., Shellenberger, S., Constantine, M.G., Streiegel, R., Sears, S.F. and Hager, A. (2000). The behavioral health care needs of rural women. Washington, DC: American Psychological Association, Committee on Rural Health.

Muñoz-Quezada, M.T., Lucero, B., Iglesias, V., Levy, K., Muñoz, M.P., Achú, E. and Villalobos, M. (2017). Exposure to organophosphate (OP) pesticides and health conditions in agricultural and non-agricultural workers from Maule, Chile. International Journal of Environmental Health Research. 27(1): 82-93.

N. (2013, May 8). Declining number of farmers: The alarming trend must be reversed. ORF. https://www.orfonline.org/research/declining-number-of-farmers-the-alarming-trend-must-be-reversed/.

Peel, D., Berry, H.L. and Schirmer, J. (2015). Perceived profitability and well being in A ustralian dryland farmers and irrigators. Australian Journal of Rural Health. 23(4): 207-214.

Pingali, P.L. (2012). Green revolution: Impacts, limits and the path ahead. Proceedings of the National Academy of Sciences. 109(31): 12302-12308.

R. (2017). The future of food and agriculture trends and challenges. FAO. https://www.fao.org/3/i6583e/i6583e.pdf.

Ramirez, D.P.C. (2021, December 30). What Is Social Wellbeing? 12 Activities for Positive Relationships. Positive Psychology. Com. https://positivepsychology.com/social-wellbeing/.

Ramos, A.K., Su, D., Lander, L. and Rivera, R. (2015). Stress factors contributing to depression among Latino migrant farm workers in Nebraska. Journal of Immigrant and Minority Health. 17(6): 1627-1634.

Robertson, S. (2007). EBOOK: Understanding Men and Health: Masculinities, Identity and Well-being. McGraw-Hill Education (UK).

Roy, P., Tremblay, G., Robertson, S. and Houle, J. (2017). "Do it all by myself": A salutogenic approach of masculine health practice among farming men coping with stress. American Journal of Men's Health. 11(5): 1536-1546.

Rudolphi, J.M., Berg, R.L. and Parsaik, A. (2020). Depression, anxiety and stress among young farmers and ranchers: A pilot study. Community Mental Health Journal. 56(1): 126-134.

Ryff, C.D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. Psychotherapy and Psychosomatics. 83(1): 10-28. https://doi.org/10.1159/000353263.

Siegel, M., Starks, S.E., Sanderson, W.T., Kamel, F., Hoppin, J.A. and Gerr, F. (2017). Organic solvent exposure and depressive symptoms among licensed pesticide applicators in the agricultural health study. International Archives of Occupational and Environmental Health. 90(8): 849-857.

Singh, S., Hanna, E.G. and Kjellstrom, T. (2015). Working in Australia's heat: Health promotion concerns for health and productivity. Health Promotion International. 30(2): 239-250.

Stain, H.J., Kelly, B., Carr, V.J., Lewin, T.J., Fitzgerald, M. and Fragar, L. (2011). The psychological impact of chronic environmental adversity: Responding to prolonged drought. Social Science and Medicine. 73(11): 1593-1599.

Udmale, P., Ichikawa, Y., Manandhar, S., Ishidaira, H. and Kiem, A.S. (2014). Farmers× perception of drought impacts, local adaptation and administrative mitigation measures in Maharashtra State, India. International Journal of Disaster Risk Reduction. 10: 250-269.

Vins, H., Bell, J., Saha, S. and Hess, J.J. (2015). The mental health outcomes of drought: A systematic review and causal process diagram. International Journal of Environmental Research and Public Health. 12(10): 13251-13275.

Wang, D., Ma, J., Tan, L., Chen, Y., Li, X., Tian, X. and Liu, X. (2017). Epidemiology of severe mental illness in hunan province in central China during 2014-2015: A multistage cross-sectional study. PLoS One. 12(11): e0188312.

Weisskopf, M.G., Moisan, F., Tzourio, C., Rathouz, P.J. and Elbaz, A. (2013). Pesticide exposure and depression among agricultural workers in France. American Journal of Epidemiology. 178(7): 1051-1058.

Wheeler, S.A., Zuo, A. and Loch, A. (2018). Water torture: Unravelling the psychological distress of irrigators in Australia. Journal of Rural Studies. 62: 183-194.