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Issues and Challenges of Institutional Support in Influencing the Participation of Persons with Disabilities in the Agricultural Sector

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Abstract

Person with disabilities (PWD) often have limited employment opportunities due to discrimination as well as the negative stigma from employers and society about their abilities. As a result, they usually live in poverty as they face unemployment and low pay, which subsequently leaves them struggling to cope with the ever-increasing living costs. Studies have shown the benefits of providing PWD with employment in the agricultural sector. It fosters self-sufficiency in food production and independence amidst increasing living costs. Based on the critical role of institutional support in enhancing PWD involvement in the agricultural sector, this study was conducted to examine issues and challenges regarding institutional support for the involvement of PWD in the agricultural sector. This study employed the quantitative research design, and purposive sampling was used to select 56 respondents from six Community-Based Rehabilitation (CBR) centers in Selangor who were involved in agricultural projects. The study found that institutional support, including motivations and subsidies; helps encourage more PWDs' involvement in the agricultural sector. On the other hand, the study found several issues and challenges related to the provision of credit and financing services, assistance and support, ineffective extension advisory services, and the lack of agricultural equipment and innovations tailored to PWD needs. The findings suggest that emphasizing policies, developing an inclusive system and adopting approaches tailored to PWDs' needs in the agricultural sector will ensure that PWD can contribute optimally to the country's economic development.

Keywords: Agricultural Sector, Institutional Support, Involvement, Extension Officers, Persons with Disabilities.

Introduction

Approximately 16% of the global population lives with one or more disabilities (1). In this regard, 80% of persons with disabilities (PWD) are living in low and middle-income countries. In general, PWD often face discrimination and are denied their rights to basic needs and autonomy. They are also subjected to violence, injustice, poverty, and hardship. Their living conditions are further worsened by discrimination and the absence of employment opportunities (2), resulting in living under the poverty line (3-6). As a result, PWDs' involvement in employment is still relatively low globally. Only one in three PWDs is employed, and the level of unemployment is even higher for female PWDs (7). The lack of employment has led most PWDs, specifically those living in rural areas, to have a low economic status and live in poverty as they have to spend their low income on living expenses, as well as costly assistive devices and medical care (6).

PWD need to actively participate in economic activities (8). However, PWD are often discriminated against and excluded from social development and economic activities due to their disability. The African countries faced losses of between 3% and 7% of their GDP when they excluded PWD from the workforce (9). Thus, there is an urge to ensure equal rights for all individuals, regardless of ability or disability, gender, social, economic, cultural background, or religion, to attain a good quality of life. PWD should be given the same rights to access public facilities and opportunities in employment, education, and social life (10, 11).

In Malaysia, the rights of PWD are acknowledged through the Persons with Disabilities Act 2008

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(Act 685), which was enacted to protect the rights of PWD and provide them with equal opportunities, subject to the limitations and rights stated in the National Constitution (12). The Act also highlights that the collaboration between the government and private organizations is paramount to protect the rights of the PWD by providing PWD access to facilities and services to PWD without sidelining the rights of normal individuals (13). In line with this effort, the Ministry of Social Welfare introduced the National Policy for Persons with Disabilities in 2007, which aims to recognize PWD as part of society with equal rights and opportunities to participate in the community. This is in line with Social Welfare Malaysia vision to advocate for PWDs' rights and safeguard their welfare. The government has implemented different programs and strategies targeting PWD development, such as the 2016-2022 Action Plan for PWDs, which highlights strategic priorities according to the 2007 Disability Policy (12). However, despite all the different incentives and policies to encourage PWD engagement in employment, studies showed that PWDs' employment rate is still low (14).

Both public and private agencies have focused on providing the best facilities for PWD who are considered a minority group (15). PWDs' welfare is always prioritized to safeguard their rights as citizens and cater to their needs. PWDs' rights should be honored, and they should be given the opportunities to contribute to the country's development (13). In this regard, providing suitable career opportunities can provide PWD with better welfare and living conditions, giving them equal rights as other members of society (16). In the meantime, PWD have special needs that require assistance services, training equipment, and facilities (8). They are viewed as incapable and not independent. The lack of employment opportunities forced PWD to be reliant on assistance from their family, the government, and the private sector in their everyday lives. Notably, while society has become more aware and open towards PWD needs, some employers are still uncertain about hiring PWD due to the perception that PWD tends to take more sick leaves, require higher insurance premiums and need stricter safety policies and special facilities at the workplace, all of which have led to low confidence in PWDs' ability to perform job tasks. Employers who hire PWD need to make adjustment and bear higher costs to ensure their safety (16). The stigma of PWDs' limited work skills and capabilities further hinders employers from hiring them.

The call for inclusivity highlights the need for PWD to be functionally integrated into society (8). As the agricultural sector has long been considered the backbone of the economy (17), it provides ample job opportunities, including for the poor and marginalized, and can be a solution to solve poverty among rural populations (18). Supporting PWD to be involved in the agricultural sector can increase their independence and, subsequently, lead to better life conditions (5). Agriculture is seen as a solution for issues like rising living costs worldwide. In urban areas, those earning below the minimum wage are considered urban poor, and in the Malaysian context, the urban poor population also includes PWD as they struggle to find employment (19).

The urban poor are facing threats of high cost of living due to rising food prices and this has undermined their access to fresh food. As a result, programs like community gardening have been introduced in many impoverished urban communities to encourage people to be involved in small-scale agricultural activities like planting their vegetables not only as a source of food but as to be sold as a source of income. Such programs, undoubtedly, can help decrease the burden of high food prices and living costs (18, 20). At the same time, boosting agriculture can help fulfil the ever-increasing demand for healthy, fresh, chemical-free, and high-quality food in line with the growing trend towards healthy lifestyles. Participation in agriculture, even on a small scale, can allow PWD to meet their food needs and generate income from farm sales (21). In addition to providing employment opportunities for PWD, agricultural activities also offer therapeutic benefits and contribute to physical, mental, and health recovery (21, 22).

According to the social model of disability, the factors that hinder the participation of persons with disabilities (PWDs) as members of mainstream society stem from physical, attitudinal, environmental, and institutional barriers. Introduced by Oliver in 1990 and subsequently refined with Barnes (23, 24), this model asserts that disability research must

consider contemporary political contexts and advocate for the inclusion of PWDs in the labour market, including issues related to capitalist free-market economies and minority rights. Further argue that disability is conceptualized as a limitation in performing activities due to current social organization, which insufficiently acknowledges or accommodates individuals with impairments (25). As a result, PWDs are often excluded from social activities. Such social exclusion can impede their ability to build a meaningful quality of life within the community (26). These barriers present significant challenges to their participation, interaction, and meaningful contribution to society (24). In addition, social, economic, and political factors arising from societal barriers, particularly those related to economic participation—can adversely affect the well-being of PWDs (27). Environmental and institutional constraints that further limit their participation include economic barriers; systems, services, and policy structures; transportation; natural and built environments; assistive technologies; access to information and communication technologies; as well as social support and public attitudes. These factors collectively influence the level of engagement and success of PWDs in any programme (28).

The main challenges affecting PWD participation in the agricultural sector are: societal attitude, including prejudice, discrimination, and stigma; environmental factors involving physical and digital infrastructure and communication; and institutional constraints related to policies, laws, and regulations (2, 29). Within commercial settings, discriminatory attitudes and stigma persist, particularly the perception that agricultural activities demand substantial physical labour, which is assumed to be unsuitable for individuals with disabilities. Given that many PWDs experience limited mobility and difficulty performing physically demanding tasks, they are often excluded from agricultural roles. Consequently, PWDs are perceived as incapable of managing agricultural activities and producing high-quality outputs (2, 29).

Inclusive participation of PWDs in agriculture requires strategic interventions, including their involvement in the design of agricultural tools, leadership opportunities, and continuous institutional support (30). Therefore, institutional factors are viewed as playing a critical role in determining individuals' participation in agricultural extension programmes and in the adoption of new methods (5). Furthermore, institutional influence includes changes in existing policies and support from local government (5, 31). For instance, systematic promotion and the delivery of clear information to PWD encourage their participation in agriculture. In this sense, limited institutional support, policies with no focus on specific programs, the lack of promotion, low knowledge and skills among extension officers, bureaucracy, and institutional mismanagement can hinder the development of the agricultural industry. Research in Ogun State, Nigeria found that agencies, such as welfare organizations, provide training and create employment opportunities in agriculture, such as open-field and greenhouse cultivation, livestock production, contract farming methods, and agricultural processing and marketing sectors. The role of institutions is crucial in preparing and improving access to agricultural training, assistive technologies, agricultural inputs, land ownership, and agricultural credit or loans (32). Efforts to increase PWD participation in agriculture should align with agricultural development programs that emphasize skills development and exposure to agricultural activities. Extension officers should also be attentive to creating opportunities for PWD to engage in agricultural activities during their leisure time (32). This will ensure that PWD receive full institutional support and feel included in the nation's economic development, thus increasing their contribution to the National Gross Domestic Product (GDP).

As the use of technology requires high investment and management costs, institutional support is essential as PWD farmers often have little access to funding, which restricts their ability to use new agricultural methods and advanced technologies. In Canada, farmers with disabilities frequently have less access to extension services, Access to these services is restricted for several reasons, including limited availability of adaptive technology, education, and funding, which results in lower income and financial hardship (33). Therefore, integrated and efficient support at the institutional level is needed, along with careful policy planning and systematic promotion to increase farmers' acceptance and implementation

of new agricultural methods (20, 31). The provision of facilities and support from relevant agencies can increase sustainability in agriculture. Such support can reduce issues like logistics limitations, lack of information from agencies, poor management and supervision at the institutional level, and lack of funding, incentives and subsidies for development that impact agricultural activities (5). At the same time, the industry is facing a shortage of local experts, particularly in research and development, which can undermine its growth (5). In the context of PWDs, there is a need to focus on disability-inclusive policies supporting the use of universal design principles and assistive technologies to encourage and support their participation in agriculture. PWD should also be empowered financially, including in business development and organizational sectors, to maintain their active participation in agriculture.

PWD farmers often have limited capital and lack access to credit financing services, which restricts their participation in agriculture (32, 34, 35). While they have access to land for cultivation, PWD farmers lack funding to sustain their agricultural activities and require credit financing to buy higher-quality agricultural supplies and modern equipment. They also face environmental challenges, such as limited access to physical facilities for transport and storage, marketing, planting, farm management, and harvesting, as well as digital infrastructure for agricultural management due to the lack of funding. Many financial institutions and extension officers also have no PWD-oriented services to cater for their needs, worsening the situation (17, 34). In this regard, institutional support can improve the provision of incentives and access to affordable credit financing to encourage PWDs' involvement in agriculture. PWD farmers should be given easier access to subsidies and financial assistance to provide them with working capital to buy supplies like seeds and fertilizers and to improve their access to better irrigation, storage, and transportation facilities (21, 34, 35). All of which can improve the livelihoods of PWD farmers.

Institutional support can encourage agricultural commercialization and the development of entrepreneurial skills among small-scale farmers (36). This will increase their market access and generate higher income. Institutional can be support for young PWD entrepreneurs in the form of tangible and intangible (15). Tangible support comprises provision funding, courses and training, and equipment, while intangible support involves mental support from family, friends, and counsellors. The study found that young PWD entrepreneurs receive more tangible support than intangible support, indicating high institutional support. Similarly, the Japanese government also provides both forms of support, which are tangible and intangible support to encourage PWDs' participation in agriculture. Intangible support provided includes guidelines in agricultural work and information manuals to guide different support initiatives, such as the use of assistive tools for farmers, agricultural production companies, and welfare services (21).

PWDs' involvement in agriculture is dependent on institutional services, governance, and the development of procedures, policies, and practices to inclusively involve them in agricultural activities and value chains (34). In Southeast Nigeria, agricultural extension programs often do not focus on the support and assistance provided to PWD farmers (34). Thus, institutional support is important in ensuring that all forms of support are efficiently delivered to address issues posed by social stigma, environmental constraints, and institutional limitations (2, 29, 37). Farmers' decision-making processes in managing agricultural activities are also influenced by institutional support. Thus, PWD should be given leadership roles, decision-making responsibilities and the necessary skills and opportunities for better well-being (2). Institutional officers play a crucial role in systematically promoting and decimating information to encourage PWD participation (5, 31). Issues like the lack of policies regarding land ownership rights can negatively affect farmers' decision-making regarding land use practices and long-term productivity in the agricultural sector. Based on a study conducted in Nigeria, large-scale farming undertaken by farmers with disabilities was shown to be hindered by institutional structural barriers, including restricted access to land, agricultural inputs, credit, and extension services. These findings highlight that the primary challenges faced are institutional in nature, rather than attributable to a lack of interest or capacity among persons with disabilities (38). Lack of knowledge on land ownership can affect small-scale farmers with

large landholdings and hinder them from accessing suitable resources and land ownership documentation, and as a result, some agricultural land may remain unused (35). Moreover, the sustainability of small-scale agricultural activities might be impacted by land disputes and a lack of resources. These issues force farmers to shift from agricultural activities (39).

Small-scale farmers, including PWD, often miss out on the markets and competitive value chain due to their lack of knowledge and training in agricultural management and marketing skills. At the same time, the lack of information has limited PWDs participation in the agricultural sector, and this has impacted in economic growth of developing countries. African countries lose 3-7% of their GDP due to the exclusion of PWD in agriculture-related policies (9). Lack of information from extension officers lead to communication barriers and increases PWD farmers' vulnerability to exploitation. Despite access to input, extension services provided by institutions may fail to deliver clear guidance to them. There are reports of PWD farmers being forced to pay up to 30% more when buying agricultural inputs like rice seeds and fertilizers. This is particularly concerning for those with hearing and speech impairments as they tend to have communication barriers and difficulties when negotiating prices for inputs and selling their produce, and in many cases, PWD farmers rely on family members to manage their agricultural activities (2). In this regard, institutional extension services offer institutional support that can help give voice to farmers and provide them with better access to market production value chains and valuable knowledge and information (2, 40).

Institutional support, in the form of extension officers, can help enhance PWDs' in the agricultural sector. Over the years, in Japan (21) and Kakamega District Western Province, Kenya (41), both government and private agencies have worked together to increase PWDs' life quality through increasing opportunities for employment and income generation, including through agriculture. In Northern Ghana, extension officers support PWD farmers by providing training in farm management, technology transfer, learning facilitation, and engaging farmers and rural communities in agricultural knowledge and information systems to tackle poverty and food insecurity (42). In Southwest Nigeria, a good relationship between farmers and agricultural extension agents positively influences production, resources and profitability (43). Through the Naroman Ba Futuro Association, Timor Leste, programs promoting non-formal education and training in small-scale agriculture are being implemented, thereby creating pathways and expanding opportunities for individuals with disabilities. The program seeks to advance and deliver comprehensive non-formal education and capacity-building programs in the agricultural sector. These efforts aim to foster active participation and reduce barriers faced byPWDs', ultimately promoting their inclusion and empowerment within the community (44).

In this regard, access to agricultural extension services helps PWD secure better income from agriculture. On the other hand, the extension officers often lack knowledge in dealing with PWD (5). Moreover, in Ghana, the government is facing issues in placing extension officers due to the high demand for them. Extension officers also face low technical experience and are not specialized in related fields (22). As a result, PWD farmers are not given sufficient attention to capacity building, training, and agricultural extension (24, 45). It can be deduced that extension officers provide adequate knowledge and support to farmers in aspects, such as post-harvest processing techniques, creativity and ideas to increase productivity, product marketing and promotion. The lack of skills among extension officers in delivering effective information to PWD farmers has undoubtedly worsened the issues they face (45). This highlights the urgent need for continuous formal education and training for extension officers working with PWD farmers.

Older, less-skilled PWD farmers often face higher challenges in adopting innovations in agricultural management. Hence, agricultural extension officers play a critical role in providing guidelines and advice. In Ghana, result shows that 41 out of 123 farmers successfully operated their mushroom farms with institutional support. The training provided by extension officers is constantly assessed and monitored to ensure its suitability for PWD. At the same time, the government has established collaborations with different parties and introduced supportive public policies to create accessible and conducive

environments, which has generated robust value and facilitated business networks for PWD farmers (22).

Accordingly, the objective of this study is to specifically examine institutional issues and challenges influencing PWD participation in agriculture from the perspective of PWDs themselves. The study is expected to contribute to strengthening inclusive empowerment of PWDs in the agricultural sector through more efficient institutional structures, ensuring that PWDs remain included and actively involved in national development. Therefore, empowerment strategies are essential to ensure that these barriers are effectively addressed through strong support systems. In the context of this study, which examines institutional issues and challenges in supporting PWD participation in agriculture, institutions play a crucial role in providing opportunities, training, and inclusive infrastructure to enhance their involvement. Institutional barriers involving policies, structural arrangements, environments, and extension services must be addressed so that PWDs can participate inclusively in the agricultural sector through appropriate access, assistive tools, and support tailored to their specific needs.

However, institutional barriers persist, and efficient, coordinated support from relevant institutions for PWD farmers remains inadequate, as indicated in previous studies such as in Ghana (17, 22), Nigeria (32, 34, 35, 38), Japan (21), Malaysia (16, 36, 37), China (6), Canada (33) and Timor-Leste (44). These studies primarily focus on the challenges faced by PWD farmers in engaging with the agricultural sector, with institutional support addressed only indirectly. The body of existing research has predominantly focused on the issues and challenges faced by persons with disabilities (PWDs) in accessing employment opportunities within the agricultural sector, while addressing institutional support only to a limited extent.

Methodology

A quantitative survey research design was employed to gather the necessary data to address the research questions. This quantitative study used a questionnaire as the research instrument and was conducted with 56 respondents using purposive sampling methods. The development of the survey items was informed by an extensive review of the literature and by reference to similarly focused instruments. The questionnaire items were duly considered and approved by the University Kebangsaan Malaysia Research Ethics Committee. Purposive sampling was employed to select participants based on predefined criteria aligned with the aims of the study, specifically persons with disabilities (PWDs) engaged in agricultural activities at Community-Based Rehabilitation (CBR) Centers. An application was submitted through the Department of Social Welfare and the CBR management to obtain study respondents comprising persons with disabilities who were participating in agricultural projects.

The study is based on six Community-Based Rehabilitation (CBR) centers selected in the state of Selangor. CBR location 1 is situated in Gombak Setia, CBR 2 in Ampang, CBR 3 and 4 in Sungai Buloh, CBR 5 in Sabak Bernam, and CBR 6 in Tanjung Karang. CBR often offer various activities, including agricultural projects in each respective CBR for PWD, their parents and the local community. These activities are aimed at supporting PWD to live independently and be integrated into society. Throughout the study, the researchers faced communication barriers as some respondents were not able to respond effectively due to physical disabilities.

Participation in this study was voluntary, and respondents were repeatedly informed of their right to withdraw and have their data removed at any time without penalty. They were assured that all information provided would remain strictly confidential and be used solely for research purposes. All respondents signed informed consent forms after receiving a full explanation of the study procedures. For participants under the age of 18, namely those aged 16 and 17, consent was obtained from their legal guardians, including CBR supervisors and managers, with parental notification also provided. In instances where communication challenges arose between respondents and the researchers, CBR supervisors acted as facilitators, as they possessed greater training and familiarity with the respondents' communication needs. These challenges primarily stemmed from physical impairments and difficulties in articulating or translating intended messages.

The survey responses were based on a 5-point Likert scale ranging from 1 [strongly disagree], 2 [disagree], 3 [somewhat disagree], 4 [agree], to 5 [strongly agree]. Descriptive analysis was performed to analyze the study data, including frequency, percentage, mean, and standard deviation. Mean scores were interpreted in three levels: low [1.00–2.33], moderate [2.34–3.66], and high [3.67–5.00] (46).

Results and Discussion

In terms of the respondents, 35 (62.5%) were male, while the remaining were female. They were primarily Malay (91.1%), followed by Chinese (7.1%) and Indian (1.8%). 50 of the respondents (89.3%) are categorized as having learning disabilities, while 3 individuals (5.4%) are categorized as having physical and mental disabilities. The majorities (73.2%) were aged between 21 and 30 years, and 23.3% were aged 20 years or younger. This trend reflects PWD parents' efforts in equipping their children with employment skills to give them independence and secure employment. The majority (75.0%) of the respondents had only completed primary school education, while the remaining 25.0% attended secondary school. This shows that PWD parents are highly focused on providing specialized training and skills to help their children transition into employment (Table 1).

The study was conducted in six Community-Based Rehabilitation (CBR) programs engaged in agricultural activities in Selangor, alongside other activities. All respondents were involved in vegetable cultivation. The findings indicate that 15 respondents (26.8%) from CBR 1 and CBR 2 and 10 respondents (17.9%) from CBR 3 were involved in agricultural activities. The majority of participants were relatively new to agricultural activities, with 31 respondents (55.4%) had been involved for 1 to 2 years, 15 (26.8%) had been involved for more than 4 years, while 9 (16.1%) for 2 to 3 years (Table 2).

Table 1: Profile of Respondent's (PWD)

Demography	Category	Frequency	Percentage (%)
Gender	Male	35	62.5
	Female	21	37.5
Ethnicity	Malay	51	91.1
	Chinese	4	7.1
	Indian	1	1.8
	20 years and below	13	23.2
Age	21- 30 years	41	73.2
	31- 40 years	2	3.6
Education level	Primary school	42	75.0
	Secondary school	14	25.0
PWD category	Physical disabilities	3	5.4
	Learning disabilities	50	89.3
	Mental disabilities	3	5.4

Table 2: The Location of Farms and the Duration of PWD Involvement in Agricultural Activities

The Location of Farms and the Duration of PWD Involvement in Agricultural Activities	Frequency	Percentage (%)
Farms Location		
CBR 1	15	26.8
CBR 2	15	26.8
CBR 3	10	17.9
CBR 4	9	16.1
CBR 5	6	10.7
CBR 6	1	1.8
The Duration of PWD Involvement in Agricultural Activities		
1-2 years	31	55.4

2-3 years	9	16.1
3-4 years	1	1.8
More than 4 years	15	26.8

Issues and Challenges of Institutional Support in Promoting Inclusive Involvement of PWD in the Agricultural Sector

Agriculture allows us to cultivate our own food source. Agricultural activities and entrepreneurship can provide PWD with a platform for economic generation, which can help improve their quality of life. However, PWD face challenges in making agriculture viable for their livelihood. These challenges include the lack of institutional support, such as a weak support system, limited access to credit financing, training, and skill development, as well as the lack of expert extension officers in providing sufficient guidance to PWD. The overall mean score was 3.06, indicating a moderate level of institutional support (Table 3).

Table 3: Issues and Challenges of Institutional Support in Promoting the Inclusive Involvement of PWD in Agricultural Activities

Issues and challenges of institutional support	Strongly Disagree	Disagree	Somewhat Disagree	Agree	Strongly Agree	Mean	Mean Score	Standard Deviation (s.d)
The lack of incentives to encourage PWD to participate in agriculture	11 (19.6%)	9 (16.1%)	15 (26.8%)	10 (17.9%)	11 (19.6%)	3.02	Moderate	1.395
Lack of assistance and support systems for PWD within the agricultural sector	9 (16.1%)	12 (21.4%)	10 (17.9%)	11 (19.6%)	14 (25.0%)	3.16	Moderate	1.437
Institutional have insufficient monitoring of the progress of agricultural activities undertaken	10 (17.9%)	16 (28.6%)	6 (10.7%)	10 (17.9%)	14 (25.0%)	3.04	Moderate	1.489
Shortage of appropriate equipment and technologies designed to accommodate the disabilities of PWD in agricultural sector	17 (30.4%)	8 (14.3%)	8 (14.3%)	10 (17.9%)	13 (23.2%)	2.89	Moderate	1.580

Lack of regular training and skill development programs to enhance the capabilities of PWD farmers	11 (19.6%)	14 (25.0%)	7 (12.5%)	10 (17.9%)	14 (25.0%)	3.04	Moderate	1.501
Agricultural extension officers are inadequately skilled in providing advisory services on agricultural management	9 (16.1%)	13 (23.2%)	7 (12.5%)	11 (19.6%)	16 (28.6%)	3.21	Moderate	1.486

Incentives for Encouraging PWD to Participate in the Agricultural Sector

Persons with disabilities (PWD) are generally given limited exposure and emphasis by institutions regarding their potential career pathways in the agricultural sector. Most initiatives targeting PWD tend to focus on other areas, such as services and information technology, which are perceived as more suitable and relevant to their capabilities. This situation reflects an imbalance in the understanding of the potential of PWD to participate meaningfully in agriculture. Institutions play a crucial role in providing encouragement, determining the level of involvement, and ensuring the continuity of individuals in agricultural extension programmes (5, 28, 41).

Based on the findings of this study, the majority of PWD respondents expressed disagreement with the statement that institutions provide insufficient encouragement for PWD to engage in the agricultural sector. Specifically, 26.8% indicated slight disagreement, 16.1% disagreed, and 19.6% strongly disagreed with the statement. Conversely, 17.9% agreed and 19.6% strongly agreed. The mean score was interpreted as moderate (3.02, s.d. = 1.395) (Table 3). These findings clearly demonstrate that institutions do, in fact, offer encouragement and support to promote the participation of PWD in agricultural activities.

This result aligns with studies (17, 23, 32, 35), which found that capital incentives and access to credit services are essential for sustaining agricultural activities among PWD. Therefore, institutions should be more proactive in providing encouragement through targeted incentives, subsidies, and comprehensive access to credit financing services to facilitate PWD participation in this sector. This need arises because successful agricultural activities require capital for operational management. Limited physical abilities also necessitate additional assistive equipment, which may increase management costs. Furthermore, negative societal perceptions of the ability of PWD to undertake agricultural work, often viewed as physically demanding and requiring high levels of concentration continue to hinder their participation in the agricultural sector.

Forms of Assistance and Support Systems for PWD in the Agricultural Sector

A total of 25.0% of respondents strongly agreed, and 19.6% agreed that the lack of assistance and support systems for PWD is a challenge to their participation in the agricultural sector. Meanwhile, 16.1% strongly disagreed. The mean score value was 3.16 (moderate) (s.d = 1.437) (Table 3). Forms of assistance and support, including technical assistance and social support systems, are crucial elements to ensure the involvement and success of PWD in agriculture. A strong and continuous support system provides therapeutic and rehabilitative benefits for PWD themselves (21, 22). However, there is a noticeable lack of

comprehensive assistance, particularly one that takes into account the specific abilities of PWD. Moreover, the support and assistance available to PWD in the agricultural sector remain extremely limited and are often not tailored to their actual needs (37). This issue arises because the existing supports systems are still generic and do not prioritize the individual needs of PWD. Persons with disabilities (PWD) who engage in farming should be provided with appropriate facilities and infrastructure equipped with technologies that correspond to their specific levels of disability. Such provisions would facilitate farm operations, enhance productivity, and promote greater self-reliance among PWD farmers, as demonstrated in initiatives implemented in Japan (21).

The study indicates that social support and training facilities for PWD are inadequate. There is no clear mechanism in place to assist PWD in planning and managing their agricultural projects from start to finish. Government institutions, non-governmental organizations (NGOs), and the private sector are lacking in collaboration to create a holistic and sustainable support ecosystem for PWD. This denies PWD equal opportunities to engage and progress alongside others in the agricultural sector. This situation often leads to the marginalization of PWD from fully benefiting from the assistance allocated for their participation in the sector.

Monitoring the Development of Agricultural Activities by Institutions

Proactive and continuous monitoring of the agricultural activities undertaken by PWD is crucial to ensure the efficient execution of crop production operations (21, 32). Weak monitoring and guidance can lead to numerous problems in farm management activities, such as inefficiencies in resource and agricultural input utilization, compromised achievement of optimal yields, and failures in financial management (37). This can result in farmers incurring greater losses. The study results indicate that 28.6% disagreed, 17.9% strongly disagreed, and 10.7% somewhat disagreed with the statement that institutions provide insufficient monitoring of the agricultural activities undertaken by PWD. The mean score was 3.04, with a standard deviation of 1.489, interpreted as a moderate level (Table 3). This indicates that institutions do monitor the agricultural activities undertaken by PWD. Additionally, institutions provide ongoing guidance to respondents in managing agricultural activities. This monitoring should be conducted with consideration for the specific needs of PWD, offering support in the form of technical training or more intensive advisory services. Accurate and timely information should also be improved to prevent PWD from relying on limited sources of information. This finding is consistent with studies (22, 32) which indicate that regular monitoring and accurate information enhances the decision-making capabilities and operational management skills of farmers with disabilities.

Provision of Appropriate Equipment and Technology for the PWD in Agriculture

Institutions must consider the challenges faced by PWD in operating agricultural equipment. In this regard, relevant agencies should help provide farmers with access to PWD-friendly equipment that is flexible, lightweight, or easy to operate by individuals with physical disabilities. The lack of appropriate equipment and technology will hinder PWDs' ability to be productive and succeed in the agricultural sector. However, the Malaysian agricultural sector still lacks specifically designed equipment to fulfil the needs of PWD. This issue is attributed to limited research and development (R&D) for PWD-friendly technologies. Many PWD farmers have no access to disability-friendly farming equipment and technology, and as a result, they become less productive and demotivated from continuing agricultural activities.

Similarly, this study found that the lack of suitable equipment/technology for PWD creates challenges for them to be involved in agriculture. 41.1% of respondents agreed with the statement, 23.2% strongly agreed, and 17.9% agreed. The study obtained a moderate mean score of 2.89 (s.d = 1.580) (Table 3). This finding indicates that assistance is less focused on fulfilling the specific needs of PWD farmers, such as providing equipment adapted to their physical and mobility requirements and financing for agricultural projects. This finding is consistent with other researchers, who highlighted the need for institutions to increase access equipment and technology tailored to the physical and mental conditions of PWD to encourage their involvement in agricultural activities (21, 32, 42). In this sense,

innovation is crucial to improving the participation of PWD in agriculture (15).

Regular Training and Skill Development to Enhance the Skills of PWD Farmers

The majority of respondents disagreed that institutions provide insufficient regular training and skill development to PWD farmers. Specifically, 25.0% disagreed, 19.6% strongly disagreed, and 12.5% somewhat disagreed with the statement, suggesting a lack of institutional involvement in providing training and skills support to PWD farmers. The mean score is at 3.04 (moderate) (s.d = 1.501). Thus, training and skill development can help productivity and work effectiveness for PWD farmers. In this light, there is still limited training that caters to the needs of PWD and they often face challenges due to their limited knowledge and skills to use modern and competitive agricultural strategies. Relevant institutions should provide inclusive, continuous training programs for PWD farmers that not only offer basic knowledge but also more specific technical training in using appropriate equipment, financial management, and product marketing. Training programs adapted to PWD needs should also be conducted periodically to ensure their progress in this field (21, 22). This is consistent with studies conducted in Timor-Leste (44), Ghana (17, 22, 45), and Southern Africa (36), which found that access to information through training and skills development has enhanced the knowledge levels of farmers with disabilities. Improved skills have further strengthened their capacity to utilize the facilities, infrastructure, and technologies provided, subsequently contributing to increased agricultural productivity.

The Skill Level of Extension Officers in Providing Advisory Services

Extension officers play a role in offering advisory services for PWD farmers and farm owners. However, it was found that most extension officers lack sufficient skills and knowledge, which leads to limitations in providing advisory services tailored to the agricultural management needs of PWD. The majority of respondents strongly agreed (28.6%) and agreed (19.6%), while 12.5% somewhat disagreed and 16.1% strongly disagreed. The mean score is moderate (3.21), with a standard deviation of 1.486. These findings are consistent with other studies that also found that institutional officers do not have the knowledge and skills to provide effective advisory services and information on agricultural management (5, 32, 40, 45). This is important among PWD involved in farm management as it requires more specific approaches and techniques compared to those employed by non-disabled farmers. More inclusive and focused guidance is needed to cater for PWDs' special needs, specifically in technical and logistical aspects. The lack of knowledge and understanding of PWDs' specific needs can hinder extension officers from providing effective advisory services in managing farms involving PWD. Moreover, the lack of inclusive and detailed guidance increases the likelihood of failure in farm management, adding pressure and challenges to farmers (5, 34, 45).

The results (42) mirror that extension advisory services are primarily oriented toward enhancing agricultural productivity, alleviating poverty, and strengthening food security among farmers in Northern Ghana. These outcomes are consistent with earlier research (20-21) indicating that higher levels of education and professional training significantly improve the competencies of extension agents. This evidence highlights an urgent need to expand continuous formal education and specialized training for agents with lower educational qualifications, enabling them to develop broader agricultural expertise and improve service delivery to PWD. In this regard, technology adaptation involves the systematic integration of diverse knowledge and skills to address the multifaceted challenges encountered by farmers.

However, this study concentrates exclusively on the issues and a challenge related to institutional support from the perspective of persons with disabilities (PWDs) in influencing their participation, and does not evaluate the institutional structures implemented for PWDs within the agricultural sector. Consequently, future research should undertake a more comprehensive examination of institutional structures, including a systematic assessment of existing policies. Such an assessment should determine the extent to which these policies are effectively translated into practice, encompassing regulatory frameworks, operational guidelines, infrastructure provision, capital support, and

institutional capacity-building geared toward promoting inclusive participation of PWDs in agriculture.

Strategies to Enhance the Participation of PWDs in the Agricultural Sector

Institutions play a critical role in establishing an inclusive agricultural ecosystem. Institutional support shapes the ability of PWDs to access employment opportunities in agriculture and to develop the capacity required for greater self-reliance. Strengthened institutional support can also enhance the competitiveness and involvement of PWDs in community-based social and economic entrepreneurship. Despite institutions being recognized as key drivers of inclusion, several major issues and challenges persist, including the lack of dedicated policies and guidelines for PWD participation in agriculture; inaccessible agricultural infrastructure; limitations in training programmes and qualified instructors; financial constraints; inadequate inter-institutional collaboration; and the influence of institutions in shaping community attitudes toward PWDs in agricultural employment. Accordingly, several specific recommendations are proposed to strengthen the participation of PWDs in the agricultural sector, including the following:

- Providing comprehensive training and financial support to help recognize PWD's capabilities in agriculture
- Improving access to resources, assets and financial support through introducing and implementing inclusive policies and strategies.
- Offering more comprehensive financial and non-financial incentives, such as marketing programs and awareness campaigns.
- Improve PWDs' access to affordable credit facilities through more lenient conditions, such as acceptable credit terms and interest rates.
- Supporting knowledge sharing and innovation between extension agents and PWDs. Extension agents should take follow-up actions with PWD to ensure effective dissemination of knowledge, information, and practical applications.
- Training extension officers using focused modules on inclusive farming or plantation management for PWDs.
- Training extension officers to be more empathetic to the needs of PWD farmers so that they can provide comprehensive guidance and motivate PWD farmers to be more efficient and competitive.
- Ensuring understanding and effective delivery of information through effective communication between extension officers and PWD farmers so that their needs could be met.
- Increasing skill development by ensuring effective sharing of innovations in agricultural management. This can be done through demonstration and practical training
- The provision of more collaboration between government agencies, extension officers and experts in PWDs' rehabilitation.
- Supporting research and development initiatives and increasing investment to provide accessibility technology and infrastructure to allow PWD to use their unique knowledge and skills to improve efficiency.

Conclusion

While agriculture can potentially provide PWD with economic opportunities, they still face institutional challenges hindering them from actively participating in the sector. The success of PWD in agriculture can be increased by providing incentives, support, equipment, training, and credit financing and effective monitoring. Continuous efforts from the government and relevant bodies, as well as the society, can increase inclusivity in the agricultural sector for the benefit of all groups, including PWD. Issues and challenges faced by PWD are not only limited to the lack of encouragement or support but also to the lack of an inclusive system and adaptive approaches to meet their specific needs. Hence, there is a need for a holistic approach guided by a deep understanding of PWDs' challenges and needs in the agricultural sector.

Nevertheless, the lack of effort to ensure the provision of support, incentives, training, and appropriate equipment can reduce inclusivity in agriculture and limit PWDs' involvement in the sector. This can be countered by establishing a comprehensive policy, improving practices, and providing more integrated services to improve inclusivity in agriculture to benefit PWDs. A robust institutional support system will guarantee better career opportunities for PWD in the agricultural sector. At the same time, the strategies for institutional support outlined can encourage PWD to be more competitive as they contribute to the

nation's development. Lastly, PWD involvement can safeguard the country's food security and sustainability.

Abbreviations

CBR: Community-Based Rehabilitation, PWD: Persons with disabilities.

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Author Contributions

All authors contributed equally to the conception and design of the study. Rosmiza M.Z. – Data collection, writing and reviewing the article. Zaimah Ramli: Data analysis, interpretation of results, Aizan Sofia Amin: Data analysis, interpretation of results, Sarmila Md. Sum – Data analysis, interpretation of results.

Conflict of Interest

The authors have disclosed no conflict of interest.

Ethics Approval

JEP-2023-681 (Ethics Ref. No.) provide by The Research Ethics Committee, Universiti Kebangsaan Malaysia.

Declaration of Artificial Intelligence (AI) Assistance

Using AI for generate idea and formatting the references in Vancouver style.

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