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Women farmers in rural agriculture: Experience in the dry zone low country agro-ecological region of Monaragala district- Sri Lanka

Hettiarachchi HAN
PhD, Senior Lecturer, Department of Geography, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

Abstract
Women in developing countries play an important role in rural agriculture. Therefore, they are considered as the backbone of rural economies. Role of women in rural agricultural sector vary considerably between and within regions and are changing rapidly in many parts of the world. The importance of their contribution on this sector is a fascinated theme in Sri Lankan research field too. This study was conducted to investigate the existing nature of the engagement of women farmers in the dry zone low country agro-ecological region of Sri Lanka. Using a combined method which include both qualitative and quantitative research techniques, a total of 125 women farmers from four villages of the above region was selected by non-probability sampling technique. A questionnaire survey was mainly employed to collect data over a period of two months. Findings of this research revealed that women in the study area perform multidimensional role from beginning to the end of a cultivation season and even thereafter. A vast variety of crops are cultivated by them and they have been motivated by different reasons to choose agriculture as their main livelihood. This research further emphasized few important aspects including the nature of the cultivations, time allocation, farming experience, type of labour usage and land ownerships. Even though the role perform by women of the region is at of a satisfactory level they do face a number of constrains. Finally, it is highlighted some significant measures to relieving them from these problems to ensure a prosperous future.

Keywords: women farmers, rural agriculture, dry zone low country agro-ecological region

Introduction

Women are considered as the backbone of rural societies since they play a pivotal role in agriculture and on the well-being of their families. Over the last few decades, they have broadened their involvement in agriculture by making up almost 50 percent of the global labor force in agricultural sector. As stated by UNCATD (2015) [19] women make up around half of the agricultural labor force of the least developed countries. The average share of women in agricultural labor force in developing countries is 43 percent. This share ranges from 20 percent in Latin America to 50 percent in Eastern Asia and sub-Saharan Africa. Referring the statistics cited by Basavaraj and Babus (2018) in their research, Chukwujekwu *et al*. (2021) [7] also highlight that women contribute about 43 percent of agricultural labor globally. SOFA Team and Cheryl Doss (2011) [15] specified that women make essential contributions to rural agricultural economies in all developing countries. As they have further stated, the role of women in agricultural sector vary considerably between and within regions and are changing rapidly in many parts of the world. Henry (2021) [9] cited Sutton (2020) and stated that 80 percent of the agricultural production of Africa and Asia comes from small farmers who are mostly rural women. They also play an important role in agricultural production and management (Yan *et al*, 2021) [20]. The importance of their contribution on the agricultural sector is further highlighted by the same authors referring the research findings of Onyalo (2019). Accordingly, women produce between 60 to 80 percent of food in most developing countries and are responsible for half of the world's food production. At the same time, these authors further referred Onyalo (2019) and Ngomane and Sebola (2019) to signify the role of women in agricultural sector and consequently stated that they play an important role in agricultural labor supply, food production and other related fields.

Labor utilization in rural agricultural societies and role perform by men and women in farming activities are extremely context-specific and gender-specific. This specification has caused on the generation of some specific patterns therein. Agricultural gender role in rural societies on one hand is a cultural norm and a social value on the other hand. Thus, there are some activities specifically perform by women. Occasionally, they do engage in some of the activities that are believed to be performed by men. At the same time there are some male specific activities in which women are not permitted to undertake at all. Nevertheless, women make essential contributions and play multiple roles in rural agricultural sector as farmers, co-farmers, wage labors and caretakers. As stated by Butt *et al*. (2010) [5] rural women play a key role in agricultural sector by working from soil preparation up to post-harvesting. In justifying this background, they have supported the research findings of Habib (1996); ESCAP (1996) and Ahmed and Hussain (2004). The diverse role perform by women are not limited to land preparation, planting of crops, harvesting, transporting, processing, storing and marketing of farm

and non-farm produce (Chukwujekwu *et al*, 2021) [7]. In order to justify this argument Chukwujekwu *et al*. (2021) [7] further contend Adenugba and Raji-Mustapha (2013) and concluded that the numerous roles played by women in rural societies include animal husbandry, food processing and preparation, working for agricultural and non-agricultural enterprises, engaging in trade and marketing and caring for their families.

Labor utilization of women in rural agricultural societies include land clearing and preparation, land tilling, seed bed preparation, sowing, planting and transplanting, weeding, fertilizer/manure application, chemical application, crop protection, harvesting, food processing, threshing, winnowing, sun drying, packing, milling, transportation and marketing. Thus, they contribute in every stage from beginning to the end of a cultivation season and even thereafter. During the off season they do engage in post harvesting and seed selection, seed treatment and preparation for the next cultivation season. Such multifaceted task perform by women attracted the attention of a vast number of researchers. Accordingly, it has been found from different studies that women are the most important force in rural agriculture which provide most of the labor force in the field.

Amin *et al*. (2009) [2] conducted a research titled "participation level of rural women in agricultural activities" in Pakistan and highlighted a few important aspects. Highlighting the study of Jiggins *et al*. (1998) and Fabiyi *et al*. (2007) above authors have stated that women's substantial contribution continues to be undervalued in conventional agricultural and economic analysis and policies, while men's contribution remains the central, often sole focus of attention. In the same research Amin *et al*. (2009) [2] have further explained that women participate in almost all agricultural activities except cutting of trees and spraying of chemicals.

As per the opinion of Mohiuddin *et al*. (2020) [12] female agricultural labor in developing countries is largely informal and their significant contribution is not properly acknowledged and rewarded. Referring the findings of a series of research, Luqman at al. (2011) [11] concluded that women's involvement in agricultural operations vary from country to country and region to region due to different reasons.

Even though women all over the world play an immeasurable role in agricultural sector, they also face different challenges. Ugwu (2019) [17] mentioned that women engaged in rural agriculture face numerous constraints and they are hardly ever able to attain their full potential with respect to the substantial efforts they put into agricultural sector. As she has further stated several studies have been conducted to explore the constraints of women's participation in agricultural activities. According to the perception of Ugwu (2019) [17] gender inequality faced by women in all spheres of life is the most glaring of these obstacles. With this opinion, this author has further referred Baba *et al*. (2015) and stated that the issues faced by women in agriculture may exist in different forms. As per the opinion of UN Women Jordan (2018) [18] lack of time due to domestic responsibilities, climate related issues such as water shortage, lack of knowledge and experience are the common challenges faced by women in rural agricultural sector.

Sri Lanka is a fertile tropical island with a rich agricultural history and diverse farming systems evolved through thousands years. This centuries old agricultural system is mainly dominated by the rural agricultural sector. Almost 82 percent of the total population in the country resides in rural areas and more than 70 percent of them are depending on agriculture as their main livelihood in which women have actively participated and make a vital contribution. The Department of Census and Statistics of Sri Lanka (2020) [8] reported that of the total women employed in the country, 27.7 percent (this share is 25.9 percent for males) are working in the agricultural sector and majority of these women engaged in rural agriculture. It is also noteworthy to mention here that women in agricultural sector in Sri Lanka are nearly 40 percent of the total agricultural workforce of the country. Accordingly, agricultural work is the chief occupation for the most of the Sri Lankan women and high level female labor participation is a distinctive feature of the Sri Lankan agriculture. However, the contribution of women in the agricultural society in Sri Lanka has not been properly appreciated. On the other hand, studies on this aspect too is limited. It is also noteworthy mention that researchers, policy makers and other related agencies do not pay due attention on women in agricultural sector and constraints faced by them. Therefore it is timely and significant to investigate female labor participation in agriculture and different constraints faced by them along with possible solutions to overcome such constraints.

Objectives of the study

This research was mainly designed to study the existing nature of the engagement of women farmers in rural agriculture in the dry zone low country agro-ecological region of Monaragala District, Sri Lanka. In order to achieve the main objective, several specific objectives were designed. Accordingly, it was decided to; investigate different agricultural activities perform by women, examine the nature of the labor utilization in farming process, study different constraints faced by women in performing agricultural activities and propose suitable recommendations to overcome the issues identified.

Materials, Methods and Techniques

The Study Area - The dry zone low country agro-ecological region

Citing the definition of Panabokke (1996) and the work of Panabokke and Kannangara (1975) Survey Department of Sri Lanka (2007) [16] stated that an agro-ecological region represents a particular combination the natural characteristics of climate, soil and relief. Accordingly, the country is divided into 24 agro-ecological regions. Accordingly, there are 10 regions in the wet zone, 09 in the intermediate zone and 05 in the dry zone where the dry zone low country agro-ecological region is located in the last mentioned region. The sub-regions of the dry zone has been demarcated based on the distinct difference in rainfall distribution and edaphic features.

The study area selected for this research belongs to the DL1 agro-ecological region that is characterized by two discernible peaks in rainfall distribution, and thus can support crops in both the *Yala* and *Maha* seasons. Accordingly, the study area dominates with mixed home gardens, paddy cultivation, sugar cane and rain-fed upland crops (Survey Department of Sri Lanka, 2007) [16]. This research was conducted in five villages (*Niyadella*, *Raathreewewa*, *Dambeyaya*, *Koonketiya* and *Goonagan Ara*) of *Buththala* Divisional Secretariat Division in *Monaragala* District. Geographically, these research sites are located in afore described agro-ecological region (Figure 01).

After a desk study using the secondary sources related to the above villages, the total number of families whose main occupation is agriculture was sort listed. Consequently, it was identified five women farmers from each village selected as key informants. Based on the information provided by them 25 women farmers from each village (total of 125 respondents) were selected through the non-probability sampling method. After the sample was decided, a well-structured questionnaire was used as the main research instrument to collect data. Information related to socio-economic information, different activities undertaken, nature of the cultivation, reasons to choose agriculture as the occupation, type of labor usage, land ownership, farming experience and constraints faced by are the main themes included into the questionnaire. Apart from, individual and group discussions, observations also employed to collect more descriptive information. Data collected over a period of two months were mainly analyzed by using descriptive statistical tools such as frequency counts, percentages and means.

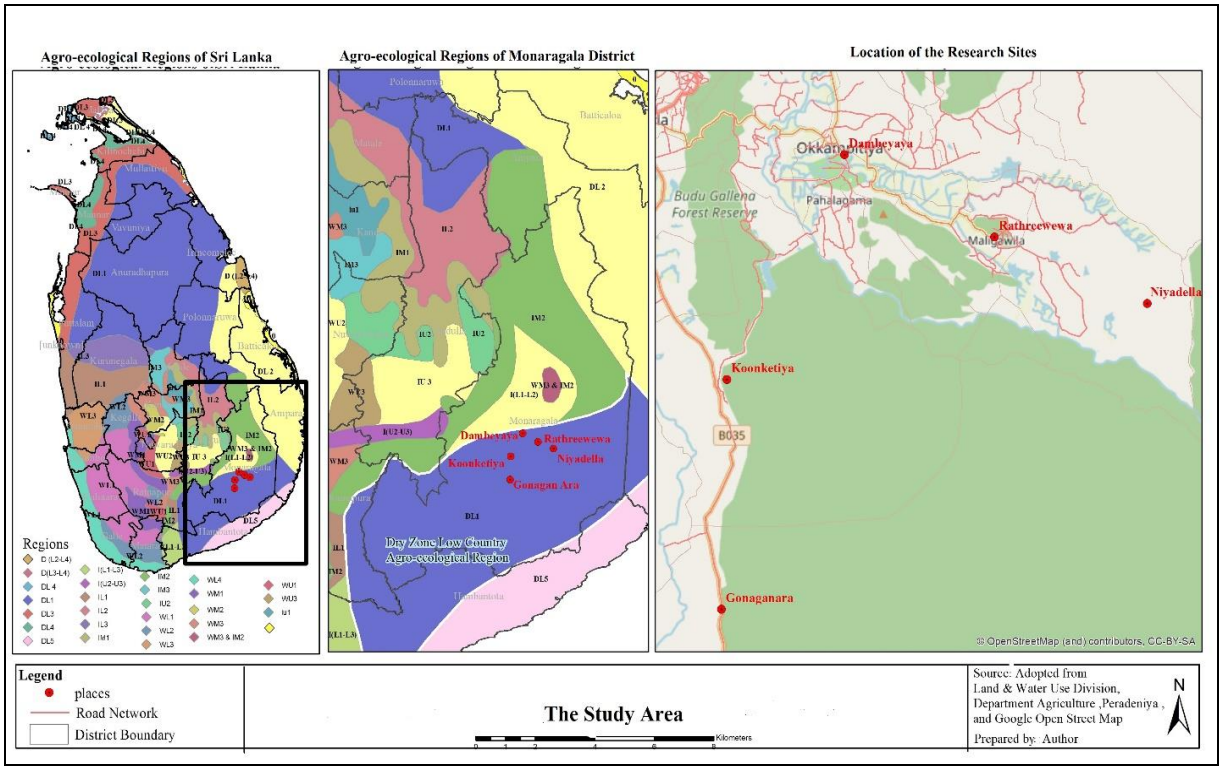


Fig 1: The study area

Results and discussion

This research was mainly carried out to study the existing nature of the engagement of women farmers in rural agriculture of the dry zone low country agro-ecological region along with a few specific objectives. The overall findings of the study were categorized into few sub sections i.e. the socio economic and demographic profile of the respondents, multi-dimensional role performed by women in the farming process, nature of the cultivation, reasons that affect to engage in agriculture, time allocation for agricultural activities, type of labor usage, nature of the land ownership, farming experience in years, constraints faced by the women farmers and possible solutions to overcome the issues identified.

Socio-economic and demographic profile

This section deals with a general discussion and an interpretation of the data related to a few themes such as the age structure, marital status, educational status and income earned from agriculture for a cultivation season. At the same time, these themes were cross linked with some important aspects. Table 01 depicts socio-economic and demographic profile of the respondents selected for the in-depth study.

Table 1: Socio-economic and demographic profile of the respondents

Characteristic	Number	Percentage
Age structure		
35-39	09	07.2
40-44	14	11.2
45-49	24	19.2
50-54	26	20.8
55-59	19	15.2
60-64	21	16.8
More than 65	12	09.6
Marital status		
Single	18	14.4
Married	103	82.4
Widow	04	03.2
Educational status		
Never being to a school or Illiterate	08	06.4
Up to grade 05	28	22.4
Grade 06-10	44	35.2
Up to ordinary level	29	23.2
Up to advanced level	14	11.2
Diploma or Degree	02	01.6
Agricultural income (for a cultivation season)		
Less than 25,000	06	04.8
25,000 - 50,000	18	14.4
50,000 - 75,000	24	19.2
75,000 - 100,000	21	16.8
100,000 <	56	44.8

n = 125
Source: Filed Survey, 2022.

Socio-economic and demographic profile of the respondents provides a vivid picture. As a whole, all women farmers included into the sample are older than 35 years old. With reference to the age related data shown in Table 01, few important conclusions can be drawn. According to the prevailing social norm of the contemporary village societies of Sri Lanka, the youth generation hesitate to engage in agriculture and related occupations. This background is clearly discernible aspect in the study area too. Accordingly, the lowest number of women (09) engaged in agriculture of the study area belongs to the age group of 35-39 years. With perusal of other age groups, another noticeable aspect could be noticed. That is, the number of women engaged in agriculture is increased in concurrent to the age. Thus, the highest number of women farmers (26 women or 20.8%) are felt between the age bracket of 50-54 years followed by the age group of 45-49 years (24 women or 19.2%), 60-64 years (21 women or 16.8%) and 60-64 years (21 women or 16.8%). Consequently, 78 (62.4%) women farmers are at of 50 years or older than. Accordingly, a positive correlation between the age and the number of women who engaged in agriculture could be identified.

The marital status of the respondents reveal that there are small numbers of women who are single or widows. Respectively, 18 (14.4%) and 04 (03.2%) women are included into these categories. In a cross sectional analysis about the marital status and the nature of the engagement in the agricultural activities, it could be noticed that the widows are engaged as manual labour suppliers who work on daily wages. Women who are singled are either engaged in co-farming or supporting the agricultural activities of family members. A total of 103 women are married and engaged in farming activities with their spouses, own parents or parents in law.

As shown in Table 01, educational status of the respondents can be categorized into 06 levels. Out of the total (125) respondents, 08 (06.4%) women have never been attend to a school and are illiterate consequently. A large majority i.e. 28 (22.4%), 44 (35.2%) and 29 (23.2%) women farmers have been able to complete their education at least up to the Ordinary Level and 14 (11.2%) have been studied up to the Advanced Level. The educational status further reveals that there are 02 women who have obtained either a diploma or a degree.

As per the data related to the annual agricultural income, there are some variations due to different reasons. One of the categories included into the sample is the women who work as labours on daily wages. Most of them do not have an opportunity work in the same way throughout the cultivation season. Consequently, they (06) receive a comparatively low seasonal income such as 25,000 rupees. A total of 18 women of the sampled population receive between 25,000 to 50,000 rupees while 24 (19.2%) women earn between rupees 50,000 to 75,000 for a cultivation season. There are 21 (16.8%) and 56 (44.8%) women who earn the highest income ranges (rupees 75,000-100,000 and more than 100,000) respectively.

Multidimensional role perform by women farmers in agricultural activities

There is a wealth of research that highlight the participation of women in rural agricultural activities. Many of them highlight the experiences of Asian, African and Latin American contexts. As stated by Luqman *et al*. (2011) [11] rural women remain busy from dawn to dusk in various agricultural activities. These include diverse doings related to pre-harvest, post-harvest and livestock management. In fact women in most of the rural societies play a major role and they actively participate in a range of activities related to crop productions and livestock management. Citing the research findings of Franzel and Helen (1992); Saito and Spurling (1992); Sharma *et al*. (1997); Ahmad and Ismail (1998); Lovenbalk *et al*. (2003); Oladeji (2004) and Oyesola (2004) on women's multifaceted role in agricultural sector has sufficiently been elaborated by Luqman *et al*. (2011) [11] and they have stated that rural farm women throughout the world are involved extensively in agricultural operations. Another important aspect in this regard has been highlighted by Ishaq (2016) [10]. According to him women are dynamic workers and they accomplish a number of farming activities to enhance agricultural productivity. These activities include seed bed preparation, weeding, harvesting, threshing, grain cleaning, food storage and engagement in cottage industries. From the results of the research findings published by Begum and Yasmeen (2011) [4] it is clearly evident that women are active laborers not only in fields and farms but they also perform the activities such as food storage, grain cleaning, threshing and livestock farming. As highlighted by above researchers, it is clearly evident that women in rural societies play an immeasurable role from beginning to the end of an agricultural season and even after. The field survey which was carried out in 04 villages also reveal a similar background. Accordingly, the whole activities performed by women farmers of the study area can be categorized into few categories (Table 02).

Table 2: Agricultural activities performed by women farmers

Activity	Number involved (out of 125)
Winnowing and sun drying	125
Planting/transplanting	122
Manual weeding	114
Grain selection, protection and storage for next season	112
Grain cleaning	119
Harvesting (other crops)	107
Fertilizer/manure application	106
Nursery management	103
Land clearing, preparation and tilling	94
Labor sharing	92
Food storage	71
Seed bed preparation	69
Watering/Irrigation	69
Seed application and sowing	54
Compost production	28
Manual harvesting (paddy)	21
Activities such irrigation cannel cleaning	17
Threshing	16
Chemical applications (weedicides, pesticides, insecticides)	14
Supporting in mechanical harvesting (paddy)	11
Labor supplying for others agricultural activities	08
Crop protection (looking after the crops)	06
Fencing	02

Source: Filed Survey, 2022.

As shown in Table 02, different activities performed by women farmers of the study area can be categorized into 23 major categories. Some of them are shown in Figure 02. Accordingly, it is evident that they perform various farm operations in the whole process of the agricultural cycle. With perusal of these activities, another noticeable characteristic could be identified. That is, they engage not only in the activities that are women specific but also in the activities performed by men. Crop protection from animals including wild elephants and fencing are some of the examples in this regard (Figure 03).

Source: Filed Survey, 2022.

Fig 2: Women engaged in different agricultural activities

Source: Filed Survey, 2022.

Fig 3: Women engaged in strictly male dominated agricultural activities

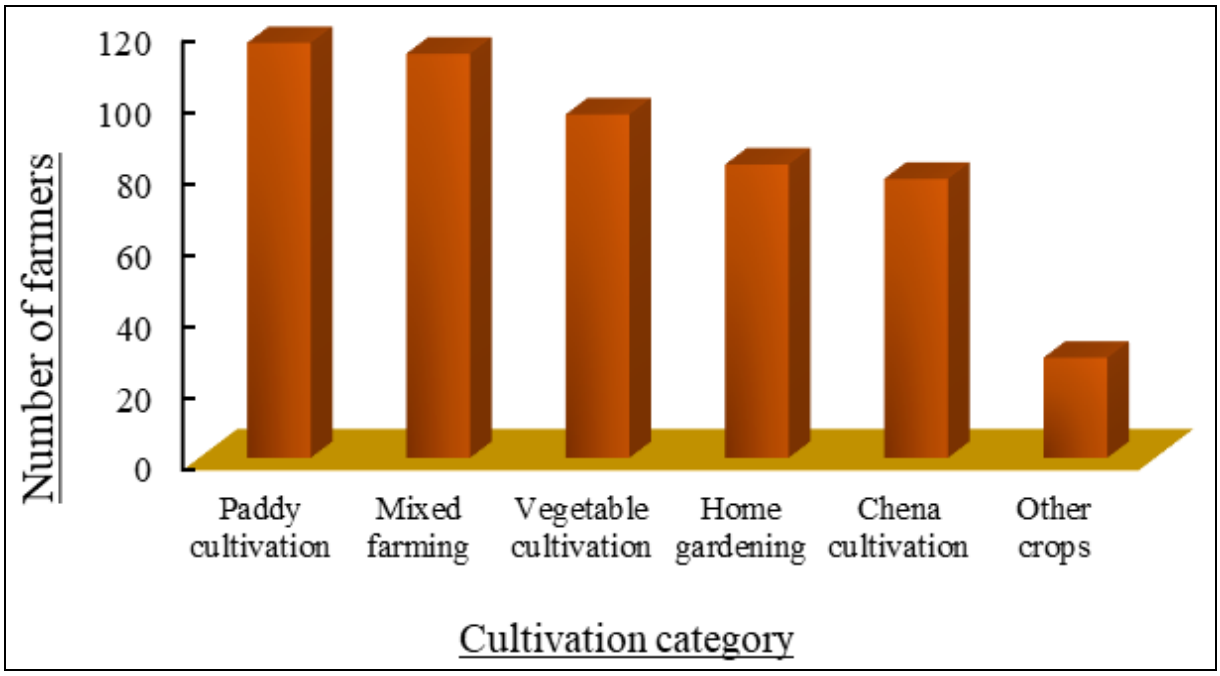
With reference to the data shows in Table 02, few conclusions can be drawn. More than 100 women do engage in activities such as winnowing and sun drying (125), planting/transplanting (122), manual weeding (114), grain selection and protection for the next season (112), grain cleaning (109), harvesting other crops such as black lentils, ground nuts, finger millet (107), fertilizer/manure application (106) and nursery management (103). These activities have been identified as women specific in accordance with the prevailing socio-cultural norms of the Sri Lankan agricultural society. It is the main reason for the high level of engagements in such activities.

Another important conclusion can be drawn from the data presented in Table 02. That is, there are comparatively low frequencies reported by the agricultural activities that are performed by both men and women. Accordingly, land clearing, preparation and tilling (94), labor sharing (92), food storage (71), seed bed preparation (69), watering/irrigation (69) and seed application and sowing (54) are such activities. The data presented in Table 02 also reveals that some activities mainly performed by male farmers are carrying out by a limited number of women. Due to the scarcity of the chemical fertilizer in Sri Lanka, there is a contemporary tendency towards the production and application of organic fertilizers. Accordingly, there are 28 women who either produce or support to produce composts. Even though paddy harvesting (both manual and mechanical) and threshing are male dominated tasks in the rural agricultural societies there are 21, 16 and 11 women who participate in such activities. Respective number of women who perform other related activities such as irrigation cannel cleaning, application of chemicals including weedicides, pesticides and insecticides are 17 and 14. There are 08 women who do not cultivate on their own land or engage in their own farming activities. Consequently, they work on hiring basis for daily wages. Apart from this, there are another 08 women who engage in some activities that are rarely performed by women. That is due to different reasons such as the labor scarcity, widowhood, matriarchal family status and female headed nature of the families. Accordingly, there are 06 and 02 women who engaged in crop protection and fencing that are strictly male dominated agricultural activities.

As discussed above, women farmers of the study area perform multifaceted roles. Although it is difficult to quantify and measure accurately they play an immeasurable role and their contribution in rural agriculture is undoubtedly significant.

Nature of the cultivations

Nature of the cultivations carrying out by women farmers is another important aspect considered in this study. Similar findings related this aspect have been highlighted by different authors. SOFA Team and Cheryl Doss (2011) [15] referred Gupta (2009) and stated that between 60 and 80 percent of food crops grow from seeds that are planted by the women farmers in developing countries. Similar to this aspect, Ajadi *et al*. (2015) [1] in their research referred Hirose and Wakatsuki (2002) and stated that the crops cultivated by women on the highlands and flood plains are millets, yam, cassava, maize, groundnut, sugarcane and rice. Carr (2008) [6] has conducted a research and identified gender patterns of cropping in central region of Ghana. Similarly, the crops cultivated by women farmers of the study area can be categorized into 06 categories (Figure 04).



Source: Filed Survey, 2022.

Fig 4: Nature of the cultivation carrying out by women farmers

The data depicts in Figure 04 show different categories of the cultivations in which women farmers are engaged in. Accordingly, paddy that is cultivated by 116 women is the most famous category followed by mixed farming that is carrying out by113 women. Cultivation of crops such as maize, black lentil, cassava, ground nut, water melon and banana in a same plot of land is the most prominent feature of this method. A total of 96 women are engaged in vegetable cultivation which include most of the dray zone vegetable varieties such as okra, marrow, tomato, bitter gourd and spine gourd. Winged bean, brinjal, cowpea, long bean and sweet potato are the most famous crops cultivated under home gardening and there are 82 women who engaged in this method. Chena cultivation is considered as the oldest farming practice in the study area. There are 78 women who undertake different activities related to chena cultivation. Finger millet, green gram, mustered, millet and sesame are mostly grown crops in chenas. Cultivation of crops such as green leaves (*Gotukola - Centella asiatica* and *Mukunuwenna - Alternanthera sessilis*), spinach, turmeric, ginger and green chili for household consumption is also a common feature of the rural agriculture in Sri Lanka. At the same time, there is a village level social norm that these cultivations need to be undertaken by females. Accordingly, there are 28 women farmers who engage in this category. According to this context, it is very clear that women in the study area cultivate diverse crop varieties in the lands.

Reasons to engage in agriculture

This aspect is a much studied theme in the research field of women in agriculture. Consistent to the findings of this research Ishaq and Memon (2016) [10] have conducted a study and found that women are engaged in agricultural activities due to different reasons. They include personal interest, desire to support the economy of the family, since it is the family profession and no availability of any other work. A similar conclusion was reached by Henry (2021) [9]. According to this research the primary reason for Guyana's rural women going into agriculture is for income generation primarily to maintain their families. Similarly, women farmers of the study area too have been motivated to engage in agricultural activities by different reasons (Table 03).

Table 3: Reasons affected to engage in agriculture

Reason	Number	Percentage
Since it is the hereditary occupation	21	16.8
Personal interest	17	13.6
Limited access to other jobs	16	12.8
Low level of education	16	12.8
Availability of space for cultivation	15	12.0
Limited professional skills	13	10.4
Ambition to contribute to the family economy	11	08.8
Influence of parents and spouse	08	06.4
Reluctance to allow family lands to fallow	08	06.4
Total	125	100.0

Source: Filed Survey, 2022.

Table 03 outlined the factors that influenced the respondents to choose agriculture as their main livelihood. Being it is hereditary occupation or family profession found to be the most common reason for a large majority (21 or 16.8%) of women farmers. Another 17 (13.6%) women have been inspired by their personal interest. Limited access to other formal jobs (no other work is available) and low level of education are the reasons for 16 (12.8%) women respectively. Number of women who have encouraged to select agriculture on the availability of space for cultivation, lack of professional skills to engage in a formal employment and the desire to contribute to the family economy are 15 (12.0%), 13 (10.4%) and 11 (08.8%) respectively. A very small minority of women (08 by each) have selected agriculture as their occupation either due to the influence of parents and spouse or due to the reluctance to allow family lands to be fallowed.

Time allocation on agricultural activities

The implications of the findings related to this section is in agreement with previous research study by Ugwu (2019) [17]. As she argued, one of the most accurate way of analyzing female contributions in agriculture is the evaluation of the time they spend in the field. Accordingly, time contribution by women on agricultural activities vary significantly and their roles may differ by crop, location, management structure, age and ethnicity. According to the information gleaned through the field survey, it is notable that time allocation on agricultural activities of the respondents provides a vivid picture (Table 04).

Table 4: Time allocation on agricultural activities

Nature of the time allocation	Number	Percentage
Weekly basis		
All seven days of the week	18	14.4
04 - 06 days per week	22	17.6
01 - 03 days per week	19	15.2
Hourly basis		
08 hours per day	08	06.4
05-07 hours per day	42	33.6
02-04 hours per day	12	09.6
Less than 02 hours per day	04	03.2
Total	125	100.0%

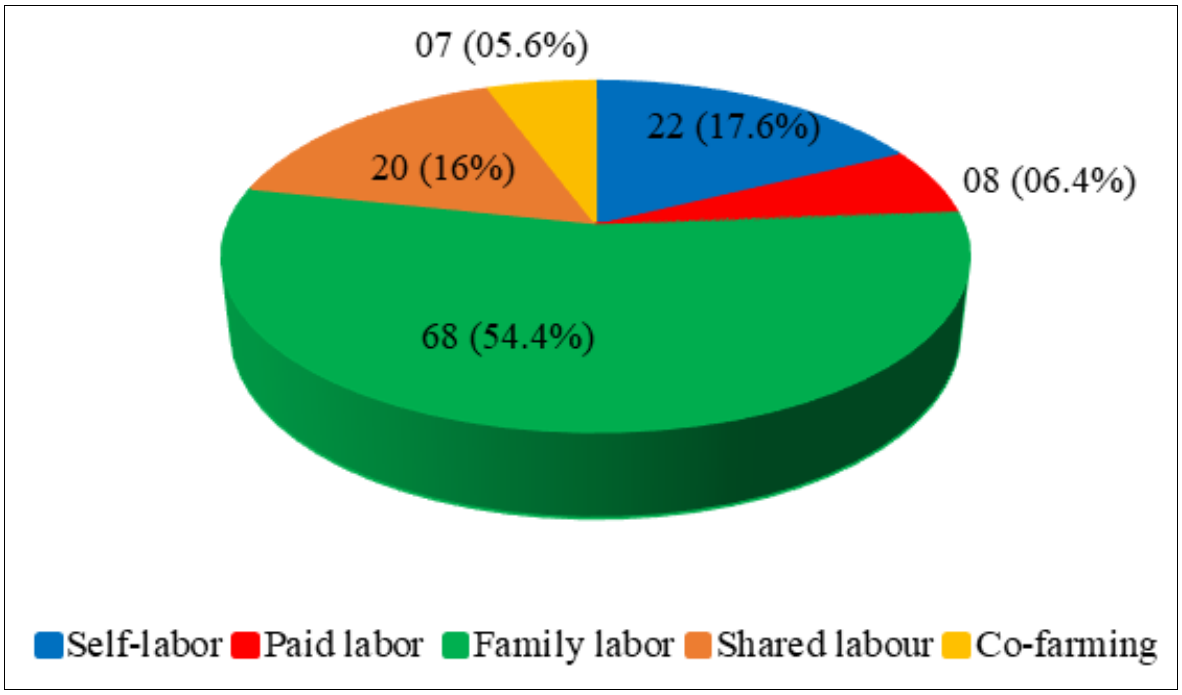
Source: Filed Survey, 2022.

Data shown in Table 04 indicate time allocation of women farmers on agricultural activities which can be divided into two categories as weekly and daily basis. Whatever the basis considered, it is clear that most of the women spend long hours in the fields. According to weekly base time allocation, a large majority of women (22 or 17.6%) work 04-06 days followed by 19 (15.2%) women who worked 01-03 days per week. There are 18 (14.4%) women who engage in agricultural activities throughout the week. With perusal of this information, a few important conclusions can be drawn. Women who spend more time the filed are full time farmers and agriculture is their main occupation. At the same time, women who work between 01 to 06 days per week do engage in other household activities such as purchasing of weekly needs from rural periodic markets.

Table 04 reveals the hourly basis time allocation also. Accordingly, there are 42 (33.6%) and 12 (09.6%) women who work between 05-07 hours and 02-04 hours per day respectively. Women who spend less hours in field pursuit agricultural activities on part time basis and do engage in other formal jobs too. There are 08 (06.4%) women who work more than 08 hours per day (the average working hours of a paid laborer) and they are labor suppliers of others fields and work on daily wages. However, the number of hours work by each woman depend on different factors such as age, marital status, distance of the field from home (location of the field), nature of cultivations, other sources of income, nature of labor supply, commitments on household activities, level of education and health conditions.

Type of labor usage

Coherent with the findings of this research, Pierotti *et al*. (2022) [13] identified five major types of labor used by married women farmers in Nigeria. They include self-labor, household labor (include spouse, children and other family members), cooperative labor, daily paid labor and yearly paid labor. Referring the work of Agarwal (1981), Baliyan (2018) [3] has categorized four types of female labor used in agricultural activities in Punjab *viz*. family, hired, permanent and casual. Simillarly, different types of agricultural labour usage of women surveyed in this research can be categorized into few categories (Figure 05).



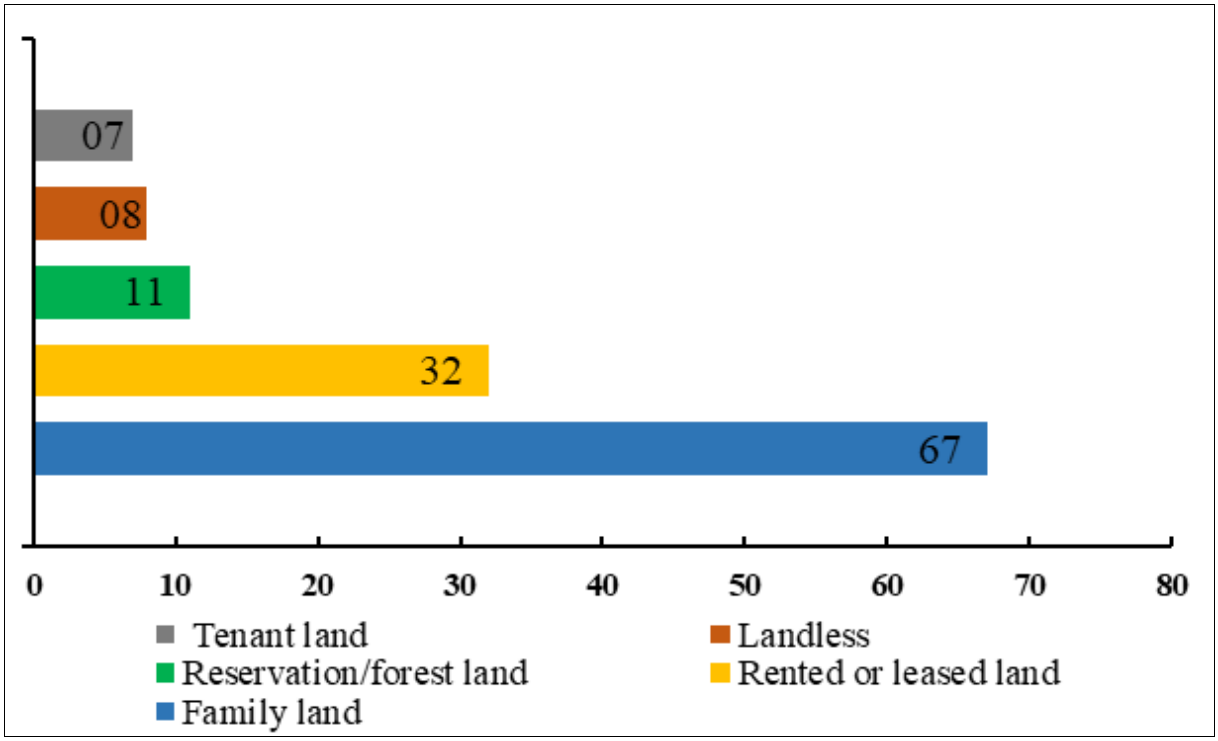
Source: Filed Survey, 2022.

Fig 5: Type of labour usage of women farmers

Type of labour usage in women operated agricultural activities depict in Figure 05 reveal considerable variations among different categories. Accordingly, the overall agricultural labour usage falls into 05 main categories. Out of which using of family labour (68 women or 54.4%) dominates all other types. Under this category, all of the family members including head of the household, spouse, own parents, father and mother in-low and children are collaboratively engaged in agricultural activities. According to the marital status of the respondents, there are 18 single women and 04 widows and they individually complete all the agricultural activities of their own. Thus, there are 22 (17.6%) women who use self-labouring and majority of them perform women specific agricultural activities such as winnowing and sun drying, planting/transplanting, manual weeding, grain cleaning, seed selection and protection, fertilizer/manure application and nursery management. Labour sharing is a unique feature of the rural agricultural societies of Sri Lanka. There are some labour sharing methods such as *Aththama* and *Kayiya* (traditional labour to labour sharing methods used in rural agricultural activities). Number of women who use these methods is 20 (16.0%). Paid female labour is accounted only for 06.4 percent of the total labour utilization in women operated agricultural activities of the study area. Co-farming also a type of traditional agricultural practice in rural Sri Lanka. Under this method, one selected plot of land is cultivated by several individuals collectively and there are 07 (05.6%) women who pursue their cultivations as co-farmers. Thus, it is clearly evident that women farmers of the study area employ different methods of labour sharing in their agricultural activities.

Nature of the land ownership

This study also focused the land ownership of women farmers. Accordingly, identified land ownerships were categorized into 05 categories such as family lands (freehold lands), rented or leased lands, reservations or forest lands and tenant lands (Figure 06).



Source: Filed Survey, 2022.

Fig 6: Nature of the land ownership

As shown in Figure 06, more than half (67 women) of the total respondents engage in agricultural activities on their own freehold lands. Some of the land owners have rented out or leased their lands for others to cultivate. Number of women farmers who carry on their agricultural activities on such rented/leased land is 32. Use of reservations or forest lands for chena cultivation is a noticeable feature in the agricultural land use of the study area. Even though there is a general tendency to prohibit chena cultivation on reservations or forest lands which belongs to the government, there are 11 women who have cultivated such lands. A least number of women farmers (07) do their cultivation on tenant lands and there are 08 landless women who provide paid labour for the agricultural activities of others.

Farming experience of women farmers

According to the literature survey, it was clearly evident that there is a dearth of research that highlight the importance of farming experience of women in rural agriculture. In general, many have made their attempt to emphasize time allocations on farming activities. Table 05 shows the farming experience of selected women farmers of the study area.

Table 5: Farming experience of women farmers

Experience (in years)	Number	Percentage
More than 20	38	30.4
15-19	34	27.2
10-14	27	21.6
05-09	17	13.6
Less the 05	09	07.2
Total	125	100.0

Source: Filed Survey, 2022.

As shown in Table 05, majority of the respondents (30.4%) having more than 20 years of experience as farmers followed by 34 (27.2%) women who possess farming experience which range between 15 to 19 years. Twenty seven (21.6%) of surveyed women reported that they are having experience in agriculture between 10 to 14 years. There are 17 (13.6%) women with 05-10 years of experience and 05 women with less than 05 years of experience. As a whole it could be noticed a steady decline in the number of farmers as per the declining in the year of farming experience.

Constraints faced by women farmers in agricultural activities

As highlighted by several research studies women engaged in agriculture in the study area also face different constraints. This finding is in agreement with previous research conducted by UNCATD (2015) [19]. According to this report, rural women farmers in least developed countries (LDCs) face multiple constraints. Referring the

report of FAO (2011) [15], UNCATD (2015) [19] further highlights a series of difficulties faced by women in agriculture. As concluded by this report, women who work in agricultural sector as farmers, unpaid family workers, paid or unpaid labourers on other lands and in agro-enterprises face several gender-specific challenges and disadvantages. Butt *et al*. (2010) [5] cited the findings of Hassan (1987) [5]; Olawoye (1993) and World Bank (1995) and stated that rural women whose occupation is agriculture face a number of constraints. They have further emphasized that women in many parts of the world operate agricultural activities under greater constraints than men. Sing *et al*. (2019) [14] have elaborated a number of constraints faced by women farmers in Bihar region of India. Citing the research findings of Slathia (2015) they have mentioned that role of women farmers has not adequately been recognized in the male dominated society in Bihar. And also women in India still face extreme disadvantages in terms of pay, land rights and representation in farmer organizations despite their dominance of the labour force. Apart from this, women face many challenges due to limited access to productive resources in agricultural production which ultimately prevent them in enhancing their productivity. Table 06 illustrates a summary of women's views on constraints that they face in farming activities.

Table 6: Constraints faced by women farmers of the study area

Constraints	Number of respondents (out of 125)
Unmanageable workload due to family commitments	104
Cultural and ritualistic obligations	87
Unpaid workload	76
Traditional perceptions	72
Gender biased norms	69
Low payments compared to men	62
Discrimination	54
Less access to land, credit, information, extension services etc.	48

Source: Filed Survey, 2022.

As shown in Table 06, there are 08 main constraints identified by the respondents of the selected sample. Out of the total, 104 women reported that unmanageable workload due to family commitments is the major constraint. According to their opinion, it is very difficult to find time to engage in agriculture with day-to-day chores at home and caring of children. There are 84 women who have stated that the prevailing cultural and ritualistic obligations in the male dominated agricultural society is another problematic issue. As per the findings of many research, it has been identified that women farmers are routinely paid less than men for their agricultural labour. Accordingly, unpaid workload has been identified as another issue by 76 women farmers. Apart from above, 72 women have described that traditional perception towards their role is another constraint. This is followed by other constraints such as gender biased norms (69), low payments compared to men (62), discrimination (54) and less access to land, credit, information and extension services (48).

Above constraints that have been faced by women farmers of the study area are have also been contributed to generate many other socio-economic issues. Adverse impact on family economy, withdrawal of experienced women from agriculture, reduction of labour productivity, decrease in expected agricultural harvest, increase of rural household poverty are some of the possible negative impact that can be associated with the constraints discussed above. Therefore there is an insistent need to introduce some practical solutions to mitigate such negative impacts. Introduction of rural level small scale and low interest loan schemes, arising agricultural awareness, widen up the access to credit, information and technology, supporting to solve the issues related to land ownership, strengthening of village level farmer associations, rehabilitation of agricultural infrastructures, distribution of quality seed varieties that produce high yield, eradication of misperceptions on women and related agricultural activities are some the possible and practical solutions that can be implemented.

Conclusion and recommendations

Agriculture is considered as the main livelihood for a vast majority of the rural communities of the developing world. At the same time it is considered as the backbone of the rural economy of the most of the countries in Asia, Africa and Latin America. High level of women's engagement in agricultural activities is a key feature in the rural agricultural sector of the above countries. This background is also a noticeable aspect in the rural agricultural sector in Sri Lanka. Many of the striking features of the agricultural labour participation of women farmers can be identified in the dry zone low country agro-ecological region of the country. Consequently, this research was undertaken to investigate the existing nature of female labour participation in rural agriculture of the above agro-ecological region with a few specific objectives. Accordingly, the overall findings of this study were discussed under several sub sections i.e. the socio economic and demographic profile of the respondents, multi-dimensional roles of women in the farming process, type of labour usage, time allocation on agricultural activities, constraints faced by them and possible solutions to overcome the issues identified.

From the results of this study, several important conclusions can be drawn. According to the age structures of the respondents a positive relationship could be identified. Accordingly, the number of farmers engaged in agricultural activities increases according to the age. Accordingly, a positive correlation do exist between the age and the number of women who engaged in agriculture. This pattern is a clear elucidation of the noticeable new

trend (withdrawal of youth groups out of agricultural activities) in the contemporary Sri Lankan agriculture. In a cross sectional analysis about the marital status and the nature of the engagement in agricultural activities, it could be noticed that widows are engaged as manual labour suppliers on daily wages and seven women are engaged in co-farming or supporting agricultural activities of family members. An overwhelming majority of female farmers (103 or 82.4%) do engage in their own agricultural activities. A vast majority (56 or 44.8%) of women whose main occupation is agriculture earns Rs. 75,000 or more per a cultivation season. Women of the sample who work as labours on daily wages receive a comparatively low seasonal income (25,000 rupees) while others seasonal income ranges between rupees 25,000 to 75,000.

Women in the study area generally perform a vast variety of agricultural activities that can be categorized into 23 major operations. Among them, there are some male dominant tasks such as crop protection from wild animals and fencing. Winnowing and sun drying, planting/transplanting, manual weeding, grain selection and protection for the next season, grain cleaning, harvesting other crops, fertilizer/manure application and nursery management are the activities that are exclusively performed by women farmers. It was also noticed that more than 100 women of the sample do frequently engage in each of the aforesaid activities. The reason that impact on such high participation is the prevailing socio-cultural norms of the Sri Lankan agricultural society. Apart from these activities, it could be identified some activities such as land clearing, preparation and tilling, labour sharing, food storage, seed bed preparation, watering/irrigation, seed application and sowing with moderate frequencies. Number of women who undertake such activities ranges from 54 to 94.

Nature of the cultivation is another important aspect considered in this study. Accordingly, paddy and mixed farming which are the most popular methods are undertaken by 116 and 113 women farmers respectively. Dry zone vegetable varieties such as okra, marrow, tomato, bitter gourd and spine gourd are cultivated by 96 women while winged bean, brinjal, cowpea, long beans and sweet potatoes are cultivated by 82 women. Chena cultivation (undertaken by 78 women) which is considered as the oldest mean of farming in the study area is dominated by the crops such as finger millet, green gram, mustered, millet and sesame. As per these findings, it is very clearly evident that women engagement in rural agriculture of the dry zone low country agro-ecological region depicts a vivid picture.

Despite the differences in the values represented, a number of key factors that led the women farmers to choose agriculture as the profession could also be identified. Accordingly, 21 (16.8%) women farmers have chosen agriculture as their main occupation being it is their hereditary/family occupation. Personal interest, limited access to other formal jobs, low level of education, availability of space for cultivation, lack of professional skills to engage in a formal employment, desire to contribute to the family economy, influence of parents and spouse, reluctance to allow family lands to be fallowed were found to be as other reasons.

Female contribution in agriculture can also be analyzed through the time allocated for agricultural activities. It is vary significantly on different reasons. As per the findings of the field survey, women whose main occupation is agriculture are routinely work maximum of 04-06 days per week. Hourly basis time allocation on agricultural activities vary according to different reasons such as age, marital status, distance of the fields from the home, nature of the cultivations, other sources of income, nature of labour supply, commitments on household activities, level of education and health conditions. Accordingly, women who spend less hours in field pursuit agricultural activities on part time basis and they do engage in other formal jobs too. The average number of hours work by women who work as paid labours is 08 per day. Overall agricultural labour usage of women farmers in the study area falls into 04 main categories such as family labour, self-labour, shared labour, paid labour and co-farming. This study also focused on the land ownership. Accordingly, women of the study area do engage in agricultural activities on their own family lands, rented or leased lands, reservations or forest lands and tenant lands. More than a half (67 women) of the total respondents engage in agricultural activities on their own freehold lands. Time duration allocated for agricultural activities is another important aspect considered in this research. Accordingly, 30.4 percent out of the total women are farmers with more than 20 years of experience. As a whole it could be noticed that there is a steady decline in the number of women farmers as per the declining in the year of farming experience.

Women engaged in agricultural activities of the study area face different constraints. In their view, these constrains have become a major problem in achieving their agricultural as well as everyday life aspirations. Conclusively, it can be emphasized that appropriate mitigatory measures are timely and significant to relieving women farmers from these problems to ensure a prosperous future.

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