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Time poverty and food production of women farmers: Case of Imbulpe DS division in Sri Lanka

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Abstract

Gender equity has been emphasized as a considerable aspect regarding sustainable development in any nation of the world. Thus, this study was conducted to assess the level of time poverty of women farmers and its impact for food production in the Imbulpe Divisional Secretariat (DS) division in Rathnapura district in Sri Lanka. The objectives were to identify the time allocation of women farmers and to assess the time poverty and the effect of time poverty on food production in the study area. A sample of 300 women farmers was randomly selected through the simple random sampling method from five selected Grama Niladhari (GN) divisions of the Imbulpe DS division. A self-administered questionnaire survey was used with the help of a pre-tested questionnaire, in data collection from April to July 2019. The model of Harvey and Mukhopadhyay (2007) was used as the measurement of time poverty with necessary modifications based on the situation of the study area. Descriptive statistics and regression analysis were used in data analysis. The findings revealed that the respondents have obtained a considerably high headcount index of time poverty (0.79)

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in their efforts in food production. Therefore, it can be concluded that women farmers who live in the Imbulpe area consist of a low level of time for their farming and leisure activities. Therefore, conducting extension programs related to the application of modern farming technologies and enhance market information accessibility to reduce the time consume when marketing their agricultural products and enhance the participation in stress management programs are timely important activities to help these women farmers.

Keywords: farming activities, food production, gender equity, time poverty, women farmers

INTRODUCTION

Currently, time is gradually becoming a significant determinant of the overall capacities and wellbeing of human beings (Mogilner *et al.,* 2018). When consider the present status of developed as well as developing countries, time poverty acts as a conspicuous issue rather than the poverty associated with income and other physical assets (UNDP, 2014). Because most of the workers are paying much more attention to the paid and unpaid care work of family members and they have not adequate time for leisure activities (Glynn, 2019; Rusu, 2015; UN, 2019).

Generally, time poverty is defined as the situation that individuals do not have adequate time for rest and leisure after allocating their time for working, domestic activities, or for any other activity such as caring and sharing with family members (Irani and Vemireddy, 2020; Zilanawala, 2014). Most of the economists showed that, time is a limited resource and if any person allocates a considerable amount of time for a paid or an unpaid work-related activity that means less leisure is available for their lives. It causes a high level of tiredness and time poverty for that individual (Matulevich and Viollaz, 2019).

Recent research findings demonstrate the variations in time poverty in the gender basis. According to the findings, women are more time-poor than men because child caring, household activities, and some other income generating activities are performed by the women (Arora and Rada, 2016; Bardasi and Wodon, 2010; Jabeen *et al.,* 2020; Urakawa *et al.,* 2020). Further, the findings of previous studies proved that women have a higher level of work intensity index than men. This higher level of work intensity index leads to an enhanced level of time poverty of women by increasing

physical and mental stress and also the higher working hours due to higher level of the workload of women than men. Therefore, a higher level of time poverty causes to reduce their working efficiency and capabilities of women farmers than men (Arora, 2015; Arora and Rada, 2016).

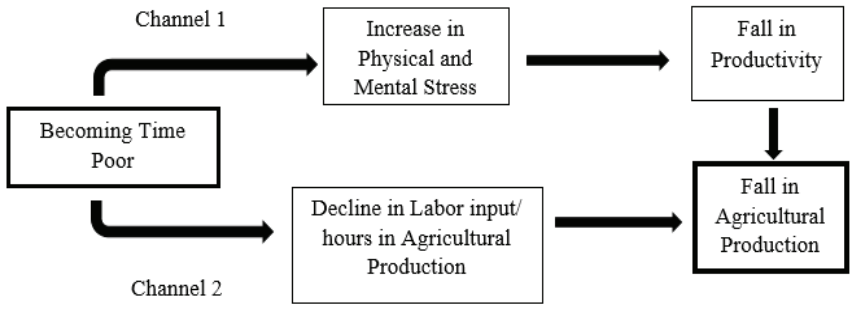

Figure 1: Impact of time poverty on agricultural production (Source: Arora and Rada, 2016).

Figure 1 shows the basic relationship between time poverty and agricultural production. This figure demonstrated the mental stress related to time poverty. An illness condition of a family member causes maximum demand for a woman's work time duration within the household. Further, the reduction of labor input or hours in agricultural production leads to minimizing the total amount of agricultural production (Arora and Rada, 2016). When consider the demand for gender division of labor in domestic activities and the agricultural sector, it reduces women's leisure time and minimizes the working capacity on the farm (Arora and Rada, 2019). As per the Channel 2 of figure 1, the reduction of women's leisure time by increasing the day length of working of women farmers has happened (Arora and Rada, 2016). According to channel 1, the high degree of women's time poverty generates negative consequences for their physical and mental stress. These factors can help to reduce agricultural production (Arora and Rada, 2016; FAO, 2013).

Some researchers and policymakers focus their attention on the use of time and time scarcity of workers. They use global measurement for the concept of time poverty, Vickery's (1977) has developed a two-dimensional demonstration of income poverty by adjusting the time based on the US

context. Douthitt (2000) developed a model, deviated from Vickery's model, by using the existing data from US Time Use Survey. Harvey and Mukhopadhyay (2007) made three adjustments to Vickery (1977) model, based on the comparison of allocatable time (TA) by making linkages between the paid work (TW) and the remaining time for the leisure (TL). If the actual allocatable time is lower than the expected allocated time for paid work, by creating the individuals being time poverty. Allocatable time is the aggregation of the estimated time that is used for paid work and available time for leisure. If the individuals are suffering from a lack of available leisure time and a low level of time for the physical and mental well-being, those individuals can be time-poor.

Time poverty has become a serious issue rather than income poverty (Giurge and Whillans, 2019; Urakawa *et al.,* 2020). Because it directly affects for the overall productivity and working efficiency of the food production of individuals. In addition to that, time poverty has influenced on the physical and mental health of people and their wellbeing (Arora and Rada, 2016). Further, in the case of women farmers who live in rural areas, they are suffering from a conspicuous level of time poverty as child caring, household activities, agricultural activities, and many other works regarding self-employment are performed by them.

Imbulpe DS division is a rural farming area where most of the women farmers are performing agricultural activities. In addition, a considerable share of men is working in urban areas. Therefore, lots of women are engaged in agriculture and allied activities. However, women farmers have to do both domestic activities and also agricultural activities in the study area. In addition to that, child caring and self-employment related activities cause to reduce the leisure time of women farmers in this area. Based on theories of time poverty, it may lead to minimize their food production by the impact of the increasing physical and mental stress of women farmers and also the decreasing of working hours related to the agricultural activities of women farmers in the study area.

Therefore, it is timely important to assess the level of time poverty of women farmers and identify the impact of time poverty on food production of them in the Imbulpe DS division, as it is hard to find literature on such type of a study yet.

MATERIALS AND METHODS

This research was conducted in the Imbulpe DS division of Sri Lanka where many agricultural activities are performed by women farmers. There are 50 Grama Niladhari (GN) divisions in the Imbulpe DS division and about 650 women farmers are living in this area. Based on a simple random sampling method, 300 women farmers were selected to conduct the study from five selected GN divisions of the study area. A pre-tested, self-administered questionnaire survey was conducted as the primary data collection method from April to July 2019. The survey was conducted as a field interview of women farmers. Descriptive statistics and regression analysis were used as the data analysis method of the study.

Areas of time allocation of women farmers were identified according to the piolet survey within the study area. Such as caring family members, household activities, agricultural activities, and different kinds of paid works.

In order to make a comparison among the two determinants of the time poverty, paid work (TW) and available time for leisure activities (TL) with the allocable time (TA) represent by the following formula,

Formula 1: Time comparison between the paid work and leisure with the allocable time.

Time for leisure (TL) = Allocatable time (TA) – Time for paid work (TW)
According to the model of Harvey and Mukhopadhyay (2007),

Formula 2: Remaining time period for the allocable time with the selected dimensions

Allocatable time (TA) = 24 - Time required to physical and mental well-being (TN) - Time required to domestic activities (T1)

These formulas 1 and 2 were used to assess the level of time poverty of women farmers with the necessary modifications according to the study. The headcount index of time poverty was assessed as follows.

Formula 3: Headcount index of time poverty (Elena and Quentin, 2006)

$$\text{Headcount index of time poverty} = \frac{\text{Individuals who are time-poor (q)}}{\text{Population size (n)}}$$

"Individuals which are time poor (q)" was calculated by identifying who are the individuals time-poor considering about the upper level of 70% of time poverty within the study area. Beyond the 70% of time poverty was taken as the marginal group of time-poor (Elena and Quentin, 2006). In addition to that, 300 of the respondents were considered as the population size of the study area.

The impact of time poverty on food production was measured by using the model of Arora and Rada (2016) with necessary modifications according to the study area. The independent variable was the time poverty of women farmers and food production was considered as the dependent variable of the study. The level of time poverty of each respondent was assessed by the model of Harvey and Mukhopadhyay 2007 with necessary modifications and based on the study of Elena and Quentin (2006). The food production of individuals was calculated as kg/acre. Because the level of food production of the study area may differ based on the size of the farmland. Primary data were analyzed with the use of descriptive statistics and regression analysis using SPSS software version 23.

RESULTS AND DISCUSSION

Socio-demographic profile of respondents

The socio-demographic factors of the women farmers are presented in Table 1. All the respondents were women; therefore, the gender variable was missed in the data. Based on the results of Table 1, the mean age range of the respondents was 40 - 49 years indicating that they were obtained in middle age category. Therefore, they have adequate power of decision-taking related to household matters and farming activities (Ibharhokanrhowa, 2016). A share of 19.7% of the respondents was reported as below 40 years whereas 4.7% of women farmers belonged to the age group of 20-29 years. The young age category (less than 30 years) constituted 4.7% of respondents and 46% of women farmers were in the middle age range (30- 50 years). In addition, 49.3% of respondents were in the age of more than 50 years. Therefore, these findings concluded that the majority of the respondents are in adult age range. According to the results of the study, 2.7% of respondents were single in their marital status, while the majority of the respondents (93%) were married.

Table 1: Socio-demographic profile of respondents (n = 300)

Selected variable	Freq.	%	Selected variable	Freq.	%
Age			No. of children		
20 – 29	14	04.7	0 child	09	03.0
30 – 39	45	15.0	1 child	56	18.7
40 – 49	93	31.0	2 children	133	44.3
50 – 59	81	27.0	3 children	85	28.3
60 – 69	54	18.0	4 children	27	09.0
70 – 79	13	04.3	5 children	05	01.7
Marital status			Level of education		
Single	08	02.7	No formal education	06	02.0
Married	279	93.0	Primary education	47	15.7
Widowed	13	04.3	Secondary education	242	80.7
Divorced	00	0.0	Tertiary education	05	01.7
Farmland size (acres)			Family size		
0 – 0.5	73	24.3	Less than 3	158	52.7
0.5 - 1	56	18.6	4 - 6	135	45.0
1 – 1.5	95	31.7	more than 6	07	02.3
1.5 - 2	76	25.3			
Monthly income			Monthly income from agriculture		
0 - 20000	25	08.3	0 – 20000	27	09.0
20001 – 40000	208	69.3	20001 – 40000	273	91.0
40001 - 60000	67	22.3	40001 - 60000	00	0.0
Number of trainings participated			Savings (to purchase inputs for next cultivation)		
0 - 10	101	33.7	0 - 1500	09	03.0
11 - 20	168	56.0	1501 – 3000	13	04.3
21 - 30	69	23.0	3001 – 4500	187	62.3
31 - 40	52	17.3	4501 - 6000	91	30.3

(Source: Field survey, April-July 2019)

The majority of the women farmers have only 2 or 3 children. Only 3% of respondents were reported that they do not have children. When respondents' level of education is concerned, while 80.7% of women farmers had gained secondary education as their level of education, there were 2% of the respondents without having any formal education. When consider the family size of the respondents, 29.7% of them had only 4 family members, 10.3% of the respondents had 5 members and 5% of respondents had 6 members in their family. Furthermore, 91% of the respondents were earning LKR in between 20001-40000 as the monthly average income while 9% of them were receiving LKR in between 0-20000.

Time allocation of the women farmers

The time allocation of women farmers for different activities is presented in Table 2. Basically, respondents allocated time according to the requirements for the day to day lives such as caring family members, household activities, agricultural activities, and different kinds of paid works.

Table 2: Time allocation of women farmers (hours per day) (n = 300)

Pattern of time allocation	Category (hours)	Frequency	Percentage
Domestic activities	5 – 10	281	93.7
	11 - 15	19	6.3
Family caring activities	5 – 10	30	10.0
	11 – 15	65	21.7
	16 – 20	205	68.3
Agricultural activities	0 – 4	47	15.7
	5 – 10	169	63.0
	11 – 15	64	21.3
Paid work	0 – 4	171	57.0
	5 – 10	129	43.0
Leisure activities	0 – 4	196	65.3
	5 – 10	104	34.7

(Source: Field survey, April-July 2019)

As per the results of Table 2, most of the respondents (93.7%) have allocated 5-10 hours per day for domestic activities. Also, a least number of women farmers (6.3%) have allocated 11 – 15 hours per day for domestic activities. When consider the family caring activities, the majority of the respondents (68%) has devoted 16 – 20 hours per day, whereas, 30% of the respondents have devoted 5 – 10 hours per day to the family caring activities. Thus, they perform fewer amounts of family caring activities, because 5 – 10 hours per day for the family caring activities were reported by most of the respondents who are widowed or adults among other respondents of the study area.

The time allocation for the agricultural activities has come under 5 – 10 hours per day by the majority of the women farmers. Also, the lowest percentage of women farmers (15.7%) has spent 1 – 4 hours per day for their agricultural activities. Because they have a higher degree of family caring and household activities. Most of the respondents have carried out self-employment activities as economic activity. Moreover, 57% of women farmers have spent 1–4 hours per day for paid work or economic activity. When consider the time allocation for leisure activities by the women farmers in the study area, the majority of the respondents (65.3%) reported that they have 0 – 4 hours per day for the leisure activities.

When consider the marginal group of time poverty, 239 respondents were selected as individuals who were time poor within the study area. According to the findings of the study, calculation of Head Count Index of Time Poverty in this area is as follows,

$$\text{Head count index of time poverty} = \frac{\text{Individuals which are time-poor (q)}}{\text{Population size (n)}}$$

$$= 0.79$$

This study reveals that women farmers in Imbulpe DS division have obtained a considerably higher headcount index of time poverty (0.79) in their efforts in food production. Therefore, it can be concluded that women farmers who lived in the Imbulpe DS division consist of a low level of time for their leisure activities. Further, the average level of time poverty was represented as 78.9% among these women farmers.

According to the studies of Bardasi and Wodon (2010), 0.735 is the level of time poverty of the rural women farmers in Guinea. When consider the women farmers in Guinea, generally allocated their time for self-

employment, paid work and unpaid work, domestic activities, and also agricultural activities. Therefore, they were showed a considerable level of time poverty than the women who lived in developed countries.

As per the results of Williams *et al.* (2015) and Zilanawala (2014), medium discretionary time was noted as 60% in relative terms of threshold time poverty of women farmers. But this study revealed that 78.9% of threshold time poverty in relative terms. However, 60% of the time poverty is represented by the studies conducted in the United States of America and the United Kingdom. Those countries were developed in their economic and social status. Most of the agricultural operations are mechanized and women's involvement in farming activities is at a considerably lower level. Therefore, women who lived in developed countries, usually perform activities in the service sector rather than the agricultural sector. The findings of Arora and Rada (2016) demonstrated that 0.72 is the level of headcount index of time poverty in rural Mozambique area. This figure little bit closer to the value of the time poverty index of the Imbulpe DS division. As Sri Lanka is a still developing country, the agricultural activities are not adequately mechanized, and a considerable level of women who lived in rural areas are engaging in farming activities rather than the service sector. In addition to that, rural women who live in Sri Lanka have to perform self-employment, paid work and un-paid work, domestic activities, and also agricultural activities generally. Therefore, women, farmers showed a higher value of time poverty within the study area.

Impact of time poverty on food production

The impact of time poverty of women farmers on food production was analyzed through the regression analysis and the related results are presented through Table 3 and 4. In here, food production was considered as the dependent variable, and time-poverty was utilized as the independent variable of the study.

As per the results of Table 3, R value denotes the higher degree of correlation which is expressed as 0.807. In addition to that, 65.2% of the total variation in the dependent variable is explained by the independent variable. The $P < 0.05$ indicates the relationship between time poverty and food production. Based on the results of the Table 4, the standard error (18.8) represents the degree of deviation of observed values from the regression line in 95% confidence interval. However, this value should

be below or approximately equal to 2.5 for the increment of the model preciseness. The coefficient was denoted as (-) 0.807 and it presents the strong, inverse relationship between the time poverty of women farmers and food production within the study area. Therefore, these findings conclude that when the time poverty of women farmers increased, food production goes down.

Table 3: Model summary of the impact analysis of the time poverty and food production

Model	R	R Square	Std. Error of the Estimate	Change Statistics		
				R Square Change	F Change	Sig. F Change
1	.807[a]	.652	899.202	.652	557.232	.000

Table 4: Coefficients of the impact analysis of the time poverty and food production

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10026.89	360.53		27.81	.000
	Time poverty of respondents	-444.75	18.84	-.807	-23.60	.000
a. Dependent Variable: What is your total food production?						

According to the studies of Arora and Rada (2016), time poverty of women farmers has an adverse effect on their agricultural production. Because they respond to increase domestic activities and family caring activities by minimizing the time duration for agricultural activities and leisure activities. Moreover, when the level of time poverty increases, it generates a negative effect on women's physical and mental status, which causes to reduce the productivity of the farm. Further, a study by Nichols (2016) revealed that time poverty creates a considerable negative impact on the food production of women farmers. In addition to that, according to FAO (2015), Women's triple working aspects of productive, reproductive, and social spheres buildup considerable impact on their food production, working efficiency, and well-being, and health. Women's reproductive and

productive workload creates a negative effect on their coffee production in Mexico based on the study of the impact of time poverty on women's participation in coffee producer organizations (Lyon *et al.,* 2017). Therefore, formulation of timely important policies to avoid time poverty of women farmers, educative approach to manage the stress conditions of the women farmers, enhance participation of family members to the farming activities, enhance market information accessibility and directed to use new farming technologies and empower women through diversification of employment activities to enhance the level of food production of women farmers in this area are highly important.

CONCLUSIONS

Most of the respondents represented an economically active range population and they have considerable educational level same as the male counterpart of the study area. The majority of the respondents were married. Therefore, they have to do child caring, household activities as well as agricultural activities. Respondents were showed about their lower level of leisure time duration due to the social responsibilities as a mother or housewife. Imbulpe area is based on rural culture and they have enough land area for the farming activities. Because their average farmland size was 1.25 acres. Most of the respondents mentioned LKR 25,000 as their average monthly income which is earning from farming activities. The time allocation for the agricultural activities has been categorized as 5 – 10 hours per day by the majority of the women farmers. Because they have a higher degree of family caring and household activities. Less than 4 hours per day was devoted by the majority of the women farmers as their time allocation for the paid performance because they have a higher degree of family caring activities and also the domestic activities. When consider the time allocation for the leisure activities of the women farmers, majority of them was prioritized domestic activities, family caring activities, agricultural activities, and paid work when allocating their time durations per day. The rest of the time duration per day was utilized for their leisure activities.

There is an impact of time poverty on food production of the women farmers because when the level of time poverty increases through physical and mental stress, and also the labor input reduction causes the lower productivity of the women farmers. Lower productivity of the respondents decreases the level of food production of the women farmers.

This study revealed that women farmers in the Imbulpe DS division obtain a considerably higher level of time poverty headcount index in their efforts in food production. Therefore, it can be concluded that women farmers who lived in the Imbulpe DS division consist with a lower level of time duration for their leisure activities and thus decreases their level of food production.

Therefore, the establishment of child daycare centers for caring for their children, allow to engaging the knowledge and skill development programs for the efficient utilization of time, conducting awareness programs for the family members especially husbands, about the time spend of women farmers to decentralize the workload of them, persuade to engaging in any kind of leisure activity by the women farmers and enhance the participation of stress management programs are timely important to enhance the women farmers lifestyle. And also, enhancement of participation of extension programs and workshops related to the application of modern farming technology and environmentally friendly farming activities and enhance market information accessibility to reduce the time consume when marketing of their agricultural products are the timely important activities that can be used to help these women farmers.

DECLARATION OF CONFLICT OF INTEREST

Authors have no conflict of interest to declare.

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