



UNIVERSITI PUTRA MALAYSIA

***DETERMINANTS OF ECONOMIC WELL-BEING AMONG SRI LANKAN
COCONUT GROWERS AND THE ROLE OF TECHNOLOGY ADOPTION***

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THILAL**

FEM 2022 21



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By

WIJEKOON KURUPPU MUDIYANSELAGE RUSITHA THILAL

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

January 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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January 2022

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Economic well-being level of Sri Lankan coconut growers' is still low due to lower level of income, and leads to greater financial vulnerabilities. Hence, Ministry of Plantation is establishing national programs to increase the economic well-being of Sri Lankan coconut growers which refers to an economic status that has sustainably adequate economic resources to live a comfortable life. However, the concept of economic well-being is still in its infancy, with only a few models established for the developing countries. Therefore, it is identified as a goal of public policy, and argued that governments should use measures of economic well-being rather than of economic activity to assess national progress and formulate policies accordingly. Therefore, identification of the determinants of economic well-being is the prerequisite to get the appropriate decisions. Hence the major objective of the current study is to examine the major determinants of economic well-being of the coconut growers in Sri Lanka. Further, it examined the mediation effect of technology adoption on the relationship between the economic well-being determinants and economic well-being, and moderation effect of age on the relationship between technology adoption and economic well-being. The theoretical framework was developed based on the reasoned linkages between the variables and the theoretical foundations of the Family Resource Management Theory, Theory of Planned Behavior, and Unified Theory of Acceptance and Use of Technology. A cross-sectional survey method using questionnaire form was conducted in the selected areas in Sri Lanka, and a sample of 416 respondents at the Coconut Triangle was initially selected using the multi-stage random sampling method. The data collected were analyzed descriptively and inferentially using SPSS and Smart-PLS software. The basic analyzes such as, descriptive analyzes were performed by using SPSS, while the inferential analyzes for instance, path coefficient analyzes, mediation analyzes, and moderation analysis were carried out by PLS-SEM. The results discovered that there were significant relationships between nine determinants (financial knowledge, financial behavior, money attitude, family members, growers' educational qualifications, growers' years of experience, willingness to change, effort expectancy, and technology adoption) and economic well-being. The 93.5% variance of economic

well-being was explained by the significant determinants of the model. Moreover, the effects of the above determinants on the variable; technology adoption were also examined. Based on the results seven determinants; financial knowledge, subjective norms (i.e. family members, peer growers, and Coconut Development Officers), willingness to change, performance expectancy, subsidies/loans were detected to have a significant positive effects on growers' agricultural technology adoption, and 94% of the variance of technology adoption was clarified. Furthermore, the technology adoption mediated the relationships between eight economic well-being determinants, such as, financial knowledge, money attitude, family members, peer growers, Coconut Development Officers, willingness to change, performance expectancy, subsidies/loans, and economic well-being. As for the moderator of age, the result displayed a non-moderated effect with regards the technology adoption and economic well-being relationship. Moreover, a significantly higher ($p < 0.01$) economic well-being was found for technology adopted coconut growers than non-technology adopted coconut growers. This study has contributed to the existing body of knowledge by providing support for the importance of the economic well-being determinants towards the economic well-being, based on theoretical reasoning and empirical findings. Further, understanding the paths that lead to better individual economic well-being has the potential to aid in successful policymaking and curriculum design to assist individuals' efforts to achieve greater economic well-being.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PENENTU KESEJAHTERAAN EKONOMI DALAM KALANGAN PENANAM
KELAPA SRI LANKAN DAN PERANAN APLIKASI TEKNOLOGI**

Oleh

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Tahap kesejahteraan ekonomi penanam kelapa Sri Lanka masih rendah disebabkan tahap pendapatan yang lebih rendah, dan membawa kepada kelemahan kewangan yang lebih besar. Justeru, Kementerian Perladangan sedang mewujudkan program nasional untuk meningkatkan kesejahteraan ekonomi penanam kelapa Sri Lanka yang merujuk kepada status ekonomi yang mempunyai sumber ekonomi mencukupi secara mampan untuk menjalani kehidupan yang selesa. Walau bagaimanapun, konsep kesejahteraan ekonomi masih di peringkat awal, dengan hanya beberapa model yang ditubuhkan untuk negara membangun. Oleh itu, ia dikenal pasti sebagai matlamat dasar awam, dan berpendapat bahawa kerajaan harus menggunakan ukuran kesejahteraan ekonomi dan bukannya aktiviti ekonomi untuk menilai kemajuan negara dan menggubal dasar dengan sewajarnya. Oleh itu, pengenalpastian penentu kesejahteraan ekonomi adalah prasyarat untuk mendapatkan keputusan yang sesuai. Oleh itu, objektif utama kajian semasa adalah untuk mengkaji penentu utama kesejahteraan ekonomi penanam kelapa di Sri Lanka. Selanjutnya, ia mengkaji kesan pengantaraan penggunaan teknologi terhadap hubungan antara penentu kesejahteraan ekonomi dan kesejahteraan ekonomi, dan kesan penyederhanaan umur terhadap hubungan antara penggunaan teknologi dan kesejahteraan ekonomi. Rangka kerja teori dibangunkan berdasarkan perkaitan yang beralasan antara pembolehubah dan asas teori Teori Pengurusan Sumber Keluarga, Teori Tingkah Laku Terancang, dan Teori Penerimaan dan Penggunaan Teknologi Bersepadu. Kaedah tinjauan keratan rentas menggunakan borang soal selidik telah dijalankan di kawasan terpilih di Sri Lanka, dan sampel 416 responden di Segitiga Kelapa telah dipilih pada mulanya menggunakan kaedah persampelan rawak berbilang peringkat. Data yang dikumpul dianalisis secara deskriptif dan inferensi menggunakan perisian SPSS dan Smart-PLS. Analisis asas seperti, analisis deskriptif dilakukan dengan menggunakan SPSS, manakala analisis inferensi misalnya, analisis pekali laluan, analisis pengantaraan, dan analisis penyederhanaan dijalankan oleh PLS-SEM. Keputusan mendapati bahawa terdapat hubungan yang signifikan antara sembilan penentu (pengetahuan kewangan, tingkah laku kewangan, sikap wang, ahli keluarga, kelayakan pendidikan penanam, pengalaman bertahun-tahun penanam, kesediaan untuk berubah,

jangkaan usaha, dan penggunaan teknologi) dan ekonomi yang baik- menjadi. Varians 93.5% kesejahteraan ekonomi dijelaskan oleh penentu penting model tersebut. Selain itu, kesan penentu di atas ke atas pembolehubah; penggunaan teknologi juga telah diteliti. Berdasarkan keputusan tujuh penentu; pengetahuan kewangan, norma subjektif (iaitu ahli keluarga, penanam rakan sebaya, dan Pegawai Kemajuan Kelapa), kesediaan untuk berubah, jangkauan prestasi, subsidi/pinjaman dikesan mempunyai kesan positif yang ketara ke atas penggunaan teknologi pertanian penanam, dan 94% daripada varians penggunaan teknologi telah dijelaskan. Tambahan pula, penggunaan teknologi menjadi pengantara hubungan antara lapan penentu kesejahteraan ekonomi, seperti, pengetahuan kewangan, sikap wang, ahli keluarga, penanam rakan sebaya, Pegawai Kemajuan Kelapa, kesanggupan untuk berubah, jangkauan prestasi, subsidi/pinjaman, dan kesejahteraan ekonomi- menjadi. Bagi moderator umur, keputusan menunjukkan kesan tidak sederhana berkaitan penggunaan teknologi dan hubungan kesejahteraan ekonomi. Selain itu, kesejahteraan ekonomi yang jauh lebih tinggi ($p < 0.01$) didapati bagi penanam kelapa pakai teknologi berbanding penanam kelapa pakai bukan teknologi. Kajian ini telah menyumbang kepada badan pengetahuan sedia ada dengan memberikan sokongan terhadap kepentingan penentu kesejahteraan ekonomi ke arah kesejahteraan ekonomi, berdasarkan penaakulan teori dan penemuan empirikal. Selanjutnya, memahami laluan yang membawa kepada kesejahteraan ekonomi individu yang lebih baik berpotensi untuk membantu dalam penggubalan dasar dan reka bentuk kurikulum yang berjaya untuk membantu usaha individu untuk mencapai kesejahteraan ekonomi yang lebih baik.

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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- the research conducted and the writing of this thesis was under our supervision;
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LIST OF ABBREVIATIONS

AANA	American Association of Nurse Anesthetists
AVE	Average Variance Extracted
CB-SEM	Covariance Based Structural Equation Modelling
CCB	Coconut Cultivation Board
CDO	Coconut Development Officer
CFA	Confirmatory Factor Analysis
CFPB	Consumer Financial Protection Bureau
CRISL	Coconut Research Institute Sri Lanka
C-TAM-TPB	Combined Technology Acceptance Model and Theory of Planned Behavior
DEWB	Determinants of Economic Well-Being
EE	Effort Expectancy
EQ	Educational Qualifications
ETA	Experience in Agricultural Technology Adoption
EWB	Economic Well-being
FB	Financial Behavior
FinTech	Financial Technology
FK	Financial Knowledge
FM	Family Members
FRMT	Family Resource Management Theory
GCE/AL	General Certificate of Education (Advanced Level)
GCE/OL	General Certificate of Education (Ordinary Level)
GDP	Gross Domestic Product

GE	Growers' Experience
GFE	General Farming Experience
HTMT	Heterotrait-Monotrait Ratio
ICT	Information and Communication Technologies
IDT	Innovation Diffusion Theory
LL	Lower Confidence Interval
MA	Money Attitude
MCAR	Missing Completely at Random
MM	Motivational Model
MPCU	Model of PC Utilization
NTA	Non-technology Adopted
OECD	Organization for Economic Co-operation and Development
PE	Performance Expectancy
PG	Peer Growers
PLS-SEM	Partial Linear Square-Structural Equation Modelling
SCT	Social Cognitive Theory
SD	Standard Deviation
SEM	Structural Equation Modelling
SL	Subsidies/Loans
SLR	Sri Lankan Rupees
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
TA	Technology Adoption
TAM	Technology Acceptance Model

TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UL	Upper Confidence Interval
US	United States
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
WTC	Willingness to Change



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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Coconut has a significant impact on Sri Lanka's livelihood and economy. In 2019, it generated Rs. 108.9 billion (US \$ 609.77 million) foreign exchange which was contributed for 0.8% of GDP of the country. Coconut sector provides livelihood directly and indirectly for around 700,000 persons; directly 100,000 in cultivation and 35,000 in the industry (Central Bank of Sri Lanka, 2019). The coconut was originally a major plantation crop throughout the humid tropics, including Sri Lanka, but now the coconut cultivation in Sri Lanka is dominated by the smallholders, and current extent of coconut in Sri Lanka is 443,538 ha. Based on the census and statistics of Central Bank of Sri Lanka (2014), the smallholding sector accounts for 83.7% of Sri Lanka's coconut cultivating lands, indicating the importance of the smallholding sector to the national coconut production. Smallholdings could be considered as coconut lands which are less than 20 acres (8.1 ha), that includes home gardens with scattered coconut palms.

The genetic makeup, the environment, and the agricultural technologies/practices are the three major factors which are majorly determined the coconut yield (Magat, 1978). Moreover, adoption of Coconut Research Institute's (CRI) recommended technologies was found to be another factor that increased 40% the yield of coconut (Liyanage, 1999), but the major problem which is associated with those smallholding coconut growers are the lower productivity in comparison to the other coconut growing countries specially due to less adoption of recommended technologies (Diagnostic Survey, 2017). Yet, the country has much-required potential to compete with those coconut growing countries, by adopting standard management practices.

Due to the lower productivity levels majority of the small holding coconut growers in Sri Lanka are poor and their economic well-being level is low (Central Bank of Sri Lanka, 2019). According to Ahmad et al. (2016), economic well-being is evaluation of both objective, and subjective components of life of a person. McGillivray and Clarke (2006, p. 4) stated that "subjective economic well-being involves a multidimensional evaluation of life, including cognitive judgments of life satisfaction, and affective evaluations of emotions, and moods". Meanwhile, assessing living conditions of people and quality of life is considered as objective economic well-being (Ahmad et al., 2016). The Organization for Economic Co-operation and Development (OECD, 2015) stated that "economic well-being is multidimensional, covering aspects of life ranging from civic engagement to housing, from household income to work-life-balance, and from skills to health status" (p. 1). Due to absence of a vastly accepted proper definition of economic well-being, OECD (2011) "argues that most experts and ordinary people around the world would agree that it requires meeting various human needs, some of which are essential (e.g. being in good health), and includes the ability to pursue one's goals, to thrive and feel satisfied with their life" (p. 2). OECD (2011) also stated that

“since economic well-being is a complex phenomenon and many of its determinants are strongly correlated with each other, assessing economic well-being requires a comprehensive framework that includes a large number of components and that, ideally, allows gauging how their interrelations shape people’s lives” (p. 2). Moreover, the OECD (2013) report has clearly mentioned that the economic well-being is a vital parameter for overall well-being. Moreover, not only the increments in income fulfill a great number of needs in life, but also it plays a vital role in achieving higher standard of economic well-being (Ahmad et al., 2016).

Economic well-being status of people fluctuates throughout their lives, from community to community, and even within households. Researchers in the context of family economics use the term “economic well-being” to describe the macroeconomic status of all households in a community at times, while at other times, they use it to describe specific micro family situations (Bauer et al., 2012). Economic well-being is concerned with how families live and earn a living, and it could be monitored in different ways. Researchers suggest class, race, place, and family structure as significant features of living and working in communities when they use statistics to explain the conditions, for instance, living below the poverty line, inner-city households, rural poor households, minority households, and single parents. In reality, researchers strive to improve the financial stability of all households over the course of their lives so that they can meet their basic needs, and those of their families (Bauer et al., 2012). As a result, it is critical to think more broadly about family economic well-being and the factors that influence it.

Hence, identification of determinants of economic well-being of Sri Lankan coconut growers’ is essential for policy makers and other coconut related organizations to develop policy prescriptions that will be needed to enhance the levels of economic well-being and hence reduce the poverty among them, because poverty is one of the biggest social problems in the developing nations like Sri Lanka. Furthermore, poverty and economic well-being are interlinked, which would reflect each other (Ahmad & Paim, 2012).

To reduce the poverty and increase the economic well-being level, Sri Lankan coconut growers should enhance their productivity in their palms, because their household income that they received is gained by selling coconut and related products, and it is highly depended on the farm gate nut price of the coconut. Due to the inconsistent nature of farm gate nut price of coconut, at any time of the year coconut growers’ income could also be vary (Diagnostic Survey, 2017), and level of economic well-being also fluctuated accordingly. Hence, to maintain a stable high income, they have to maintain their estates efficiently, and productively by adopting the technologies given by Coconut Research Institute of Sri Lanka (Diagnostic Survey, 2017).

Socioeconomic factors influence technology adoption, and these factors may have a direct influence on farmers, economic well-being (Ahmed et al., 2017). If farmers’ economic well-being is positively correlated with technology adoption, it is impossible

to differentiate whether the adoption enhances growers' well-being or whether better-off growers are more likely to accept the technologies (Wu et al., 2010). As a result, the effect of technology adoption should be distinguished from other socioeconomic factors that influence the economic well-being of technology-adopted coconut growers at the same time. Further, to improve the technology adoption efficient extension programs could be used (Wu et al., 2010). According to the observations of Wu et al. (2010), the adoption of agricultural technologies and farmers' economic well-being has a complicated relationship, and evaluating the impact of agricultural technology at the micro household level is challenging due to the complications in distinguishing the effects between technology adoption and socioeconomic characteristics.

Behaviors, in general, lead to outcomes (Ajzen & Fishbein, 1980), and favorable economic behaviors, as expected, contribute to the economic well-being. "Any human behavior that generates and manages economic resources to improve economic well-being" is referred to as economic behavior (Xiao, 2008, p. 31), and earning, budgeting, spending, borrowing, and saving are the common economic behaviors. In addition to earning, other behaviors are categorized under financial behaviors (Xiao, 2008), and nowadays, policy makers encourage certain financial behaviors, for example, retirement plans and consumer debt control. Further, other than the financial behavior, financial literacy related parameters like financial knowledge and money attitudes also play a significant role in enhancing the economic well-being of the individuals (Xiao, 2013). Therefore, for the considering population; Sri Lankan coconut growers, showing of economic behaviors is essential for them to achieve higher level of economic well-being. Moreover, subjective norms (Verma & Sinha, 2018), characteristics of the technology (Melesse, 2018), characteristics of the growers (Ramsey et al., 2008), and governmental and institutional policies (Shiferaw et al., 2009) are also directly affected on technology adoption and hence the increment of the level of the coconut growers economic well-being (Alene et al., 2016).

Therefore, the current research is designed to examine several unanswered questions about the determinants of coconut growers' economic well-being, and how the technology adoption would affect for uplifting the level of economic well-being of the coconut growers in Sri Lanka. The data in this study were collected from coconut growers at the coconut triangle in Sri Lanka, and they might allow us to identify the determinants that influence the level of economic well-being, and how technology adoption positively correlate with the level of Sri Lankan coconut growers' economic well-being. Further, it would give the opportunity to investigate the mediation effect of technology adoption between the determinants and the level of economic well-being, moderation effect of age between technology adoption and the level of economic well-being of Sri Lankan coconut growers. Clear understanding of those determinants that are vital to form a positive intention towards higher levels of economic well-being would provide an additional insight into the association between technology adoption, and the level of economic well-being.

In summary, the sound understanding of the possible underlying determinants of coconut growers' economic well-being are a pre-requisite for decision making in designing new strategies, and approaches for the improvement of coconut sector in Sri Lanka, and reduce the poverty among them. Therefore, this study aims to examine the key influencing determinants of Sri Lankan coconut growers' behavioral change towards higher levels of economic well-being, the influence of technology adoption as a mediating factor, and the influence of age as a moderating factor.

1.2 Statement of Problem

The coconut cultivation provides occupations for about 8% of the population in Sri Lanka and its contribution to the export earnings was Rs. 108.9 billion (US \$ 609.77 million) in 2019 (Central Bank of Sri Lanka, 2019). However, smallholders possess the majority of coconut holdings in Sri Lanka (almost 83.7%), while the rest is owned by estates, which include both private and government corporations. Despite the fact that the smallholding sector accounts for 83.7% of total annual coconut production, it is not properly organized and hence managed at far below the optimal levels. Hence, their productivity level is also low.

Among the several reasons that affect for the low productivity of coconut lands, the major one is the lower rate of technology adoption and according to the Coconut Research Institute's Diagnostic survey (2017), it was around 15%. The technology adoption plays a vital role to increase the productivity of a crop and it increases income of Sri Lankan coconut growers. Therefore, their major income completely depends on the crop yield and farm-gate nut price, and the technology adoption is considered as a significant indicator of yield. Hence, the technology adoption has attracted substantial attention from researchers and policy makers to comprehend the reasons for less adoption of technologies by the growers.

Moreover, new technology adopted coconut growers are less vulnerable to poverty due to high yield and income. In 2013, Xiao showed that income has a direct impact on one's economic well-being. Further, the economic well-being has a strong negative relationship with poverty and can be used as an indicator to understand and measure the poverty (Laily, 1995). Thus, the present study aims to examine the association between technology adoption and economic well-being of Sri Lankan coconut growers as well as the effect of financial factors, subjective norms, characteristics of the technology, farmer characteristics, and government/ institutional policies on economic well-being.

Previous study (Chandio & Yuansheng, 2018) has proposed that technology adoption has an effect on the farmers' income and their economic well-being, thus influence researchers to investigate the underlying link between these variables. Previous studies that were conducted to determine the mediating effect of technology adoption on economic well-being were not reported, and therefore, current study consider technology adoption as the mediator of determinants of economic well-being and the level of economic well-being of Sri Lankan coconut growers. However, to the best of the

researcher's knowledge, none of them has looked in to technology adoption to mediate the relationship between above two variables.

Majority of the Sri Lankan coconut growers were reported to have their age above 55, and most of them were engaged in the coconut cultivation after their retirement (Herath & Wijekoon, 2013). Research on successful ageing at work suggests that employees' values, motives, emotional regulation, and coping strategies may differ across the lifespan in ways that meaningfully predict their success at attaining goals. Therefore, it is very important to examine the effect of growers' age (young and older growers) on the relationship between technology adoption and economic well-being. Furthermore, most studies have been examined the variable; age as a moderator in the adoption of different technologies, and well-being related studies, but it is not used as a moderator between technology adoption and economic well-being. For example, Wongwatkit et al. (2020) have found age was moderated the association between e-learning intention and learning performance. Further, in their study on "adoption of big data analytics in healthcare", Shahbaz et al. (2020) were observed that the age was moderated the relationship between big data analytics adoption intention and actual adoption of the technology. Another study was revealed that the age played an important role as a moderator between substance use in Uruguayan adolescents and subjective well-being (Fernandez et al., 2018). However, no research was found that to prove the moderation effect of age on the association technology adoption and economic well-being.

According to Xiao (2013), the economic well-being is a multidimensional concept and most studies have been inconsistently used its determinants in the context of family economics and management, for example, financial characteristics such as, income, expenditure, asset, debt, economic behavior (earning, spending, borrowing, saving), bankruptcy, money attitude, financial satisfaction, financial knowledge (Xiao, 2013), attitudes towards the money (Hayhoe et al., 1999), social connections and relationships like subjective norms (Jain & Hundal, (2007; Shim et al., 2009), characteristics of the technology; performance expectancy, effort expectancy (Verma & Sinha, 2018), farmer characteristics such as, education (Addai & Pokimica, 2010), experience (Herath & Wijekoon, 2013), willingness to change (Dessart et al., 2019), and government/institutional policies like, subsidy schemes and loans (Xiao, 2013). However, due to the inconsistencies that are existing as the determinants of growers' economic well-being which were adopted by the previous studies, current research applied financial factors (financial knowledge, financial behavior, money attitude), subjective norms (family members, peer growers, Coconut Development Officers), characteristics of the technology (performance expectancy, effort expectancy), farmer characteristics (educational qualifications, growers' experience, willingness to change), and government/institutional policies (subsidies/loans) as the determinants of Sri Lankan coconut growers' economic well-being, because applying these set of factors might give comprehensive understanding of the construct of Sri Lankan coconut growers' economic well-being, and how these determinants affect to enhance the level of economic well-being. Furthermore, according to OECD (2011), a comprehensive framework that comprises a several number of variables that assess economic well-being is required, and therefore, thirteen above mentioned determinants were included into the theoretical framework in order to examine the concept of economic well-being effectively.

1.3 Research Questions

Due to the above issues, several questions could be arisen concerning the adoption of technologies, and its effect on Sri Lankan coconut growers' economic well-being. Therefore, current study is going to be conducted to find scientific solutions to the below research questions.

1. How do the determinants of economic well-being; financial factors, subjective norms, farmer characteristics, characteristics of the technology, government/institutional policies, and technology adoption affect economic well-being of coconut growers' in Sri Lanka?
2. How do the determinants; financial factors, subjective norms, farmer characteristics, characteristics of the technology, and government/institutional policies, affect technology adoption of coconut growers' in Sri Lanka?
3. Is there a difference of level of economic well-being between the technology adopted and non-technology adopted coconut growers' in Sri Lanka?
4. Does technology adoption mediate the relationship between determinants of economic well-being (financial factors, subjective norms, farmer characteristics, characteristics of the technology, and government/institutional policies) and the economic well-being of coconut growers in Sri Lanka?
5. Does age moderate the relationship between technology adoption and the economic well-being of coconut growers in Sri Lanka?

1.4 Research Objectives

1. To determine the differences in economic well-being of Sri Lankan coconut growers based on the determinants of economic well-being.
2. To determine the differences in technology adoption of Sri Lankan coconut growers based on the determinants of technology adoption.
3. To determine the difference of economic well-being level between technology adopted and non-technology adopted coconut growers' in Sri Lanka based on the technology adoption.
4. To examine the mediating effect of technology adoption on the relationship between determinants of economic well-being and economic well-being of Sri Lankan coconut growers.
5. To examine the moderating effect of age on the relationship between technology adoption and economic well-being of Sri Lankan coconut growers.

1.5 Research Hypotheses

To find out the answers for raised research questions above, the below hypotheses were tested.

H₁: There is a significant relationship between determinants of economic well-being of Sri Lankan coconut growers; financial factors (financial knowledge, financial behavior, money attitudes), subjective norms (family members, peer growers, Coconut Development Officer), farmer characteristics (educational qualifications, growers' experience, willingness to change), characteristics of the technology (performance expectancy, effort expectancy), government/ institutional policies (subsidies/loans), technology adoption) and economic well-being.

H_{1a}: There is a significant relationship between Sri Lankan coconut growers' financial knowledge and economic well-being.

H_{1b}: There is a significant relationship between Sri Lankan coconut growers' financial behavior and economic well-being.

H_{1c}: There is a significant relationship between Sri Lankan coconut growers' money attitudes and economic well-being.

H_{1d}: There is a significant relationship between Sri Lankan coconut growers' family members and economic well-being.

H_{1e}: There is a significant relationship between peer growers and economic well-being.

H_{1f}: There is a significant relationship between Coconut Development Officer (CDO) and economic well-being.

H_{1g}: There is a significant relationship between Sri Lankan coconut growers' educational qualifications and economic well-being.

H_{1h}: There is a significant relationship between Sri Lankan coconut growers' experience and economic well-being.

H_{1i}: There is a significant relationship between Sri Lankan coconut growers' willingness to change and economic well-being.

H_{1j}: There is a significant relationship between performance expectancy and economic well-being.

H_{1k}: There is a significant relationship between effort expectancy and economic well-being.

H_{1l}: There is a significant relationship between government subsidies/loans and economic well-being.

H_{1m}: There is a significant relationship between Sri Lankan coconut growers' technology adoption and economic well-being.

H₂: There is a significant relationship between determinants of technology adoption; financial factors (financial knowledge, financial behavior, money attitudes), subjective norms (family members, peer growers, Coconut Development Officer), farmer characteristics (educational qualifications, growers' experience, willingness to change), characteristics of the technology (performance expectancy, effort expectancy), government/ institutional policies (subsidies/loans) and technology adoption.

H_{2a}: There is a significant relationship between Sri Lankan coconut growers' financial knowledge and technology adoption.

H_{2b}: There is a significant relationship between Sri Lankan coconut growers' financial behavior and technology adoption.

H_{2c}: There is a significant relationship between Sri Lankan coconut growers' money attitudes and technology adoption.

H_{2d}: There is a significant relationship between Sri Lankan coconut growers' family members and technology adoption.

H_{2e}: There is a significant relationship between peer growers and technology adoption.

H_{2f}: There is a significant relationship between Coconut Development Officer (CDO) and technology adoption.

H_{2g}: There is a significant relationship between Sri Lankan coconut growers' educational qualifications and technology adoption.

H_{2h}: There is a significant relationship between Sri Lankan coconut growers' experience and technology adoption.

H_{2i}: There is a significant relationship between Sri Lankan coconut growers' willingness to change and technology adoption.

H_{2j}: There is a significant relationship between performance expectancy and technology adoption.

H_{2k}: There is a significant relationship between effort expectancy and technology adoption.

H_{2l}: There is a significant relationship between government subsidies/loans and technology adoption.

H₃: There is a significant difference in level of economic well-being between technology adopted and non-technology adopted coconut growers in Sri Lanka.

H₄: Technology adoption mediates the relationship between determinants of economic well-being and level of economic well-being among coconut growers in Sri Lanka.

H_{4a}: Technology adoption mediates the relationship between Sri Lankan coconut growers' financial knowledge and economic well-being.

H_{4b}: Technology adoption mediates the relationship between Sri Lankan coconut growers' financial behavior and economic well-being.

- H_{4c}: Technology adoption mediates the relationship between Sri Lankan coconut growers' money attitudes and economic well-being.
- H_{4d}: Technology adoption mediates the relationship between Sri Lankan coconut growers' family members and economic well-being.
- H_{4e}: Technology adoption mediates the relationship between peer growers and economic well-being.
- H_{4f}: Technology adoption mediates the relationship between Coconut Development Officer (CDO) and economic well-being.
- H_{4g}: Technology adoption mediates the relationship between Sri Lankan coconut growers' educational qualifications and economic well-being.
- H_{4h}: Technology adoption mediates the relationship between Sri Lankan coconut growers' experience and economic well-being.
- H_{4i}: Technology adoption mediates the relationship between Sri Lankan coconut growers' willingness to change and economic well-being.
- H_{4j}: Technology adoption mediates the relationship between performance expectancy and economic well-being.
- H_{4k}: Technology adoption mediates the relationship between effort expectancy and economic well-being.
- H_{4l}: Technology adoption mediates the relationship between government subsidies/loans and economic well-being.
- H₅: Age moderates the relationship between technology adoption and level of economic well-being among coconut growers in Sri Lanka.

1.6 Scope and Limitations of the Study

Sri Lankan coconut growers are the target respondents of this study but the sample selected for the study only comprised the coconut growers in the coconut triangle which represents more than 80% of the coconut cultivation of Sri Lanka. It represents only four districts of Sri Lanka out of twenty-four. Further the list of growers was taken from the Coconut Cultivation Board (CCB) of Sri Lanka and it was used as the population for this study. Moreover, quantitative data were gathered using close ended questionnaire might force the respondents to select a given response rather than their actual response is not representing their actual output. Biasness could also be happened in the survey due to the usage of telephone interviews rather than face to face interviews. Hence, there is a probability to give either correct answer or any other answer that reflect their own idea rather than the real practice.

1.7 Significance of the Study

Significance of the study is discussed with the aspects of theoretical, and practical. The coconut growers, policymakers, academic researchers, governmental and non-governmental organizations in Sri Lanka would get the benefits from these findings. They also contribute to improve the technology adoption among Sri Lankan coconut growers. Further, it will enhance the economic well-being of the coconut growers in Sri Lanka.

1.7.1 Theoretical Significance

The research integrates Family Resource Management Theory (FRMT; Deacon & Firebaugh, 1988), Theory of Planned Behavior (TPB; Ajzen, 1991), and Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003) to explain the foundation of the theoretical framework.

There are few previous studies applied Family Resource Management Theory as the basic theory to explain well-being (Jorgensen & Savla, 2010; Mimura, 2014; Mokhtar & Husniyah, 2017). But, the application of a single theory is inadequate to develop a good theoretical framework, and thus, some constructs from another two theories; Theory of Planned Behavior, and Unified Theory of Acceptance and Use of Technology were also included. It increases the complexity of the theoretical framework and the explaining percentage variance (R^2) of the economic well-being.

Many researchers (Borges & Lansink, 2016; Lu et al., 2009; Morris et al., 2005; Shih & Fang, 2004) have applied Theory of Planned Behavior to serve as the basis of behavioral change. Further, Theory of Planned Behavior was used by several researchers to examine the adoption of different technologies, for instance, Pavlou and Fygenon (2006); Chu and Chen (2016) to predict the process of e-learning acceptance, Aboelmaged and Gebba (2013) to study mobile banking adoption, Nasri and Charfeddine (2012) to examine the influencing factors of internet banking, Dezdar (2017) for green information technology adoption. But, there are limited researchers (Shim et al., 2009) that applied Theory of Planned Behavior to explain financial behavior and well-being. Thus this research used Theory of Planned Behavior as a theoretical foundation to describe the technology adoption, as well as economic well-being.

To the best of the knowledge of the researcher there is no evidence for the use of Unified Theory of Acceptance and Use of Technology to study economic well-being. To date, there is no research done to incorporate above three theories into a study in the area of family economics and management context. Therefore, this study is beneficial for researchers to enhance their understanding on the effect of technology adoption towards the economic well-being.

Moreover, this study incorporates technology adoption to mediate the relationship between the determinants of economic well-being and Sri Lankan coconut growers' economic well-being. Further, in several past studies financial factors, subjective norms, farmer characteristics, characteristics of the technology, subsidies/loans were revealed as significant influencing factors of the technology adoption as well as growers' well-being. Therefore, in this study, technology adoption is assumed to be mediated the relationship between the determinants of economic well-being and Sri Lankan coconut growers' economic well-being. However, no known study has considered technology adoption as a mediator to explain the association between the determinants of economic well-being and economic well-being.

1.7.2 Practical Significance

1.7.2.1 Sri Lankan Coconut Growers

Sri Lankan coconut growers are the main stake holders of this study because the major subject of the research is them and the outputs are also implemented on them to enhance the technology adoption and their economic well-being. The major objective of this research is to identify the determinants of coconut grower's economic well-being and how technology adoption affects their economic well-being. The results would be able to offer a better understanding on the determinants of economic well-being, technology adoption, economic well-being and how these aspects interconnect each other. They are important for the coconut growers to minimize the barriers of technology adoption. Hence, they would be able to manage to get the optimal yield from their coconut lands and increase the level of economic well-being. Furthermore, it would reduce the poverty among coconut growers in Sri Lanka which is also contributed to better life satisfaction.

1.7.2.2 Policymakers

Sri Lankan policymakers are another group that could use the outcomes of this study, especially in the Ministry of Plantation Industries in addressing the issues related to lower level of technology adoption by the coconut growers. One of the major strategies of the Ministry of Plantation Industries is to achieve higher coconut yield from the existing lands and uplift the financial status of the coconut growers in Sri Lanka. The statistical data and the information that provided by this study would be able them to improve uplifting policies and design new policies by targeting coconut growers in Sri Lanka.

Apart from that, governmental organizations like Coconut Research Institute of Sri Lanka (CRISL), and Coconut Cultivation Board of Sri Lanka (CCBSL) could use the information for their extension programs to transfer new technologies to the grass root level efficiently. Furthermore, they can develop new technology transferring tools to address the growers' technology associated problems successfully.

1.7.2.3 Non-governmental Organizations

The Coconut Growers Association of Sri Lanka is the major non-governmental organization that supports Sri Lankan coconut growers to uplift the coconut cultivation and industry. They could use the outputs of the study as guidelines to force the government to implement policies related to the coconut industry in order to achieve better economic well-being and hence, the strong life satisfaction of Sri Lankan coconut growers.

1.8 Definition of Terminology

1.8.1 Financial Knowledge

Conceptual: “Increased knowledge of financial matters enhances an individual’s ability to make informed decisions about how to control and manage their finances. Financial knowledge has implications for how individuals spend, save, and invest money, as well as how they budget and set monetary goals” (Wikipedia, 2020a, p. 1).

Operational: How coconut growers use their money related knowledge to spend, save, and invest money, as well as how they budget and set monetary goals.

1.8.2 Financial Behavior

Conceptual: “A human behavior that is related to money management” (Xiao, 2008, p. 30).

Operational: Money management behaviors which are shown by the coconut growers.

1.8.3 Money Attitudes

Conceptual: “An individual’s attitude towards money is called money attitudes and it is learnt from the culture of society, and one’s childhood and adulthood experiences” (Tang & Chiu, 2003, p. 16).

Operational: coconut growers’ attitude towards money.

1.8.4 Subjective Norms

Conceptual: “An individual’s perception about the particular behavior, which is influenced by the judgment of significant others (e.g., parents, spouse, friends, teachers)” (Amjad & Wood, 2009, p. 516).

Operational: An individual’s perception about the economic well-being, which is influenced by the judgment of significant others.

1.8.5 Education

Conceptual: “The knowledge and development resulting from the process of being educated” (Merriam-Webster Dictionary, 2020b, p. 1).

Operational: The knowledge and development resulting from the process of being educated by the coconut growers.

1.8.6 Experience

Conceptual: “The fact or state of having been affected by or gained knowledge through direct observation or participation” (Merriam-Webster Dictionary, 2020a, p. 1).

Operational: Coconut growers’ gained knowledge through direct observation of coconut cultivation practices or participation to the training programs.

1.8.7 Willingness to Change

Conceptual: “Willingness to change is a measure of the cognitive and emotional buy-in to the change. It can be broken down into three stages: Understanding, accepting and desire” (Changing Minds, 2020, p. 1).

Operational: The measure of the cognitive and emotional status of the coconut growers towards the adoption of a technology.

1.8.8 Performance Expectancy

Conceptual: “The degree to which the user expects that using the system will help him or her to attain gains in job performance” (Venkatesh et al., 2003, p. 447).

Operational: The degree to which the coconut growers expect that using the technology will help them to gain a good coconut yield.

1.8.9 Effort Expectancy

Conceptual: “The degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).

Operational: The degree of ease associated with the use of the technologies recommended for the coconut growers.

1.8.10 Subsidy

Conceptual: “A subsidy or government incentive is a form of financial aid or support extended to an economic sector (business or individual) generally with the aim of promoting economic and social policy” (Myers & Kent, 2001, p. 43).

Operational: A form of financial aid or support extended to the coconut growers, generally with the aim of promoting of their coconut cultivation.

1.8.11 Loan

Conceptual: “In finance, a loan is the lending of money by one or more individuals, organizations, or other entities to other individuals, organizations etc. The recipient (i.e., the borrower) incurs a debt and is usually liable to pay interest on that debt until it is repaid as well as to repay the principal amount borrowed” (Wikipedia, 2020b, p. 1).

Operational: A loan is the lending of money by the government to the coconut growers to apply coconut technologies in their lands.

1.8.12 Technology Adoption

Conceptual: “The choice to acquire and use a new innovation by an individual or an organization” (Wikipedia, 2020c, p. 1).

Operational: The choice to acquire and use a new innovation by the coconut growers.

1.8.13 Economic Well-being

Conceptual and operational: “Economic well-being is defined as having present and future financial security. Present financial security includes the ability of individuals, families, and communities to consistently meet their basic needs (including food, housing, utilities, health care, transportation, education, child care, clothing, and paid taxes), and have control over their day-to-day finances. It also includes the ability to make economic choices and feel a sense of security, satisfaction, and personal fulfillment with one’s personal finances and employment pursuits. Future financial security includes the ability to absorb financial shocks, meet financial goals, build financial assets, and maintain adequate income throughout the life-span” (Council on Social Work Education, 2020, p. 3).

1.9 Organization of the Thesis

Five chapters are included in this thesis and the first chapter gives a brief introduction on Sri Lankan coconut industry, the statement of problem of the study, research questions, research objectives, research hypotheses, scope and limitations of the study, significance of the study, and definition of terminology which is used in the thesis.

Second chapter provides a literature review on independent variables, dependent variables, background variables, and theories that used to develop the theoretical framework. The theoretical framework of the study is also discussed under chapter two.

Third chapter contains the research methodology which gives the details about research design, sampling and data collection procedure, and the development of the research instrument.

Fourth and fifth chapters discuss the results and discussion and finally the major findings of the study and their implications. Further, the recommendations for the future studies are also mentioned.

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