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A Theoretical Study on the Quality of Life of Middle-Aged and Elderly Women in Korea
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Letter from the Editor-in-Chief

The Korea Myanmar Research Institute (KOMYRA) has supported the ongoing projects on the mutual development of Myanmar and Korea in the entire field of society, economy, culture, education, science, and related industry. As a part of our efforts to provide convenient access to understand Myanmar and Korea worldwide, KOMYRA has co-published the Myanmar Journal with Yangon University of Economics (YUEco) since August 2014, and now we release the Myanmar Journal Vol. 4, No. 1.

This issue features various topics that may be of international interest, such as academic and industrial researches mainly concerning economic and social changes, labour reforms, cosmetics, tourism, etc.

We hope this journal continues to promote understanding about the present status and the potential capacities of Myanmar and Korea, and facilitate in-depth international exchange and cooperation.

I would like to express my deep gratitude to the Editorial Board and the Staff of KOMYRA who have contributed their valuable supports towards the publication of this issue of the Myanmar Journal.

Feb. 28, 2017

Youngjun Choi *yj choi*

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The Myanmar Journal (ISSN 2383-6563) is the official international journal co-published by Yangon University of Economics (YUEco) and Korea Myanmar Research Institute (KOMYRA).

This journal aims to promote the mutual cooperation and development of Myanmar and Korea through intensive researches in the entire field of society, economy, culture, and industry.

It will cover all general academic and industrial issues, and share ideas, problems and solution for development of Myanmar.

Articles for publication will be on-line released twice a year at the end of February and August every year on the Myanmar Journal webpage.

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Comparison between Maximum Likelihood Method and Robust Methods in Time Series Analysis

Maw Maw Khin

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ABSTRACT: This study attempts to compare the performance of Maximum Likelihood (ML) and Robust methods that are applied to export of maize data. The results point out that export of maize data set contains an AO outlier and the ARIMA(1,1,0) model is fitted to it. The ML estimates are extremely sensitive to the presence of AO. That is why the mean squares error (MSE) of ML method is much larger than MSE of robust methods. The RA estimates based on bisquare family have very good robustness properties for ARIMA(1,1,0) with AO outlier and they compare favorably with the *GM*-estimates. The results lead to the recommendation of the use of robust methods in time series analysis. Application of these robust methods provides outlier resistant estimates.

Key Words : Robust Estimators, Maximum Likelihood, Additive Outlier

I. Introduction

Maximum likelihood (ML) estimator has poor robustness properties and the performance of these approaches is sensitive to influential cases and the departure of the error distribution. Moreover, these procedures are affected adversely by the presence of outliers. In time series analysis, outliers can cause biases in parameter estimation as well as misspecification, resulting in misleading conclusion. For this reason, several outlier detection and robust estimation procedures have been proposed in the literature for time series analysis.

Robust estimation in the time series context is a difficult task because different types of outliers may occur in any data set. For instance, outliers can replace with or be added to some observations of the stochastic process. They can also be found in the innovation driving process. Furthermore, the configuration of time points in which the contaminations like isolated and patchy outliers occur gives different effects on

estimation of parameters of time series models. Outliers should be investigated carefully. Often they contain valuable information about the process under investigation or the data gathering and recording process. Before considering the possible elimination of these points from the data, one should try to understand why they appeared.

To overcome these shortcomings, several alternative robust estimators like M-estimators (Huber, 1981), L1-based estimators, GM-estimators (Denby and Martin, 1979), RA estimators (Bustos and Yohai, 1986) and ACM estimator (Martin, 1979) have been proposed. These estimators were applied to the export of maize data to estimate the parameters of ARIMA models and their performances were compared with the ML estimator in the presence of AO or IO.

II. Data and Methods

The secondary data were used to analyze in this study. The required data were obtained from the Statistical Year Books which are published by the Central Statistical Organization (CSO) over the period of 1976 to 2008. In this paper, the classical method namely maximum likelihood method and some robust methods such as M (Huber and Turkey Bisquare), GM, ACM and RA (Huber and Turkey Bisquare) were used to estimate the parameters of the autoregressive integrated moving average (ARIMA) model. The mean squares error (MSE) criterion was used to select the best estimator. Before analysis, the outliers and types of outliers in time series were discussed.

Outliers in Time Series

Outliers are aberrant observations that are away from the rest of the data. They can be caused by recurrent events such as recording errors or non-recurrent events such as changes in economic policies, wars, disasters and so on. They tend to occur if errors have fat-tailed distributions which might lead to large disturbances. Sometimes, outliers appear through misspecification of estimated relationships (linear instead of nonlinear relationships, omitted variables and so on).

There is no issue that outliers can cause problems with inference using the traditional methods. The only problem is that how outliers should be tackled, that is, whether they are excluded or included. According to Legendre (1805), he suggested to throw these observations out. So did Edgeworth (1887). However, if outliers are caused by misspecification of the relationships estimated, a proper course is to change the specification. If outliers are caused by fat-tailed error distributions, a proper course is to use robust methods (Maddala and Yong Yin, 1997). Thus, there are three courses

of action one can take:

- (i) throwing the rascals out.
- (ii) leaving them in but under control (robust methods) or
- (iii) changing the model.

For (i), it is required to identify the outliers.

In time series problem, because successive observations are correlated, outliers can cause more problems for detection. Fox (1972) first addressed outlier problems in time series by classifying outliers as additive outliers (AO) and innovation outliers (IO). These two types of outliers and other robustness problems in time series were discussed extensively in the time series literature (Denby and Martin, 1979, and Hampel et al., 1986). Another types of disturbances were introduced by Chen and Tiao (1990). They are the level shift (LS) and temporary change in level (TC). In the following these types of outliers were described and their plots of AO, IO, LS and TC were shown in Figure 1.

(a) Additive Outlier

Additive outlier (AO) represents a disturbance which is committed to a particular observation. Mathematically, the observed time series is seen as

$$Y_t = Z_t + w_a I_t^{(d)} \quad (1)$$

where Y_t is a contaminated time series, Z_t is an outlier-free time series, w_a denotes the magnitude of the disturbance and $I_t^{(d)}$ is an indicator variable defined by

$$I_t^{(d)} = \begin{cases} 1 & \text{if } t=d \\ 0 & \text{if } t \neq d. \end{cases}$$

In other words, for an AO model

$$Y_t = Z_t \text{ if } t \neq d \text{ and } Y_d = Z_d + w_a \text{ otherwise.}$$

The typical reason for an AO is a recording or measurement error. Outbreaks of wars, strikes, an abrupt change in the market structure of some group of commodities, a technical change or new equipment in a communication system, or simply unexpected geophysical phenomena (e.g., earthquakes) are all possible causes of AOs.

(b) Innovation Outlier

Another type of outlier is called an innovation outlier (IO), which is a disturbance in the innovational series $\{a_t\}$ and may affect every subsequent observation of the series. Mathematically, an IO model is

$$Y_t = \frac{\theta(B)}{\phi(B)}(a_t + w_v I_t^{(d)}) \quad (2)$$

where $I_t^{(d)}$ is defined as shown above and w_v denotes the magnitude of the disturbance. Rewriting the model as

$$Y_t = Z_t + \frac{\theta(B)}{\phi(B)} w_v I_t^{(d)}.$$

It can be seen that an IO effects the series through its own dynamic $\frac{\theta(B)}{\phi(B)}$ and it becomes part of the system thereafter. In practice, an IO often indicates an onset of certain changes in the system. Obviously, many other types of disturbance can occur in time series. The AO and IO models only two many possibilities.

(c) Level Shift

Mathematically, a level shift (LS) can be described by

$$Y_t = Z_t + \frac{w_s}{(1-B)} I_t^{(d)} \quad (3)$$

where w_s is the amount of shift in the level of Z_t . It can be written as

$$\frac{1}{(1-B)} = 1 + B + B^2 + \dots$$

The above model (3) can be seen as follows:

$$Y_t = \begin{cases} Z_t & \text{for } t < d \\ Z_t + w_s & \text{for } t \geq d. \end{cases}$$

Thus, the fixed constant w_s is added to every observation one or after d . Such a level shift is permanent.

(d) Temporary Change

In some cases, the effect of a level shift is only temporary. In a mathematical

model, such a shift is described as:

$$Y_t = Z_t + \frac{w_c}{(1 - \delta B)} I_t^{(d)}, \quad 0 < \delta < 1. \quad (4)$$

Since

$$\frac{1}{(1 - \delta B)} = 1 + \delta B + \delta^2 B^2 + \dots$$

the magnitudes of level shift at times $d, d+1, d+2, \dots$ are $w_c, \delta w_c, \delta^2 w_c, \dots$.

Thus, the initial shift is w_c and the subsequent shifts are discounted at the rate δ . With $0 < \delta < 1$, the shift decays exponentially to zero. Such a temporary level shift refers to a transient change model. In practice, the values of δ are a predetermined constant. Its value may be 0.8 or 0.7.

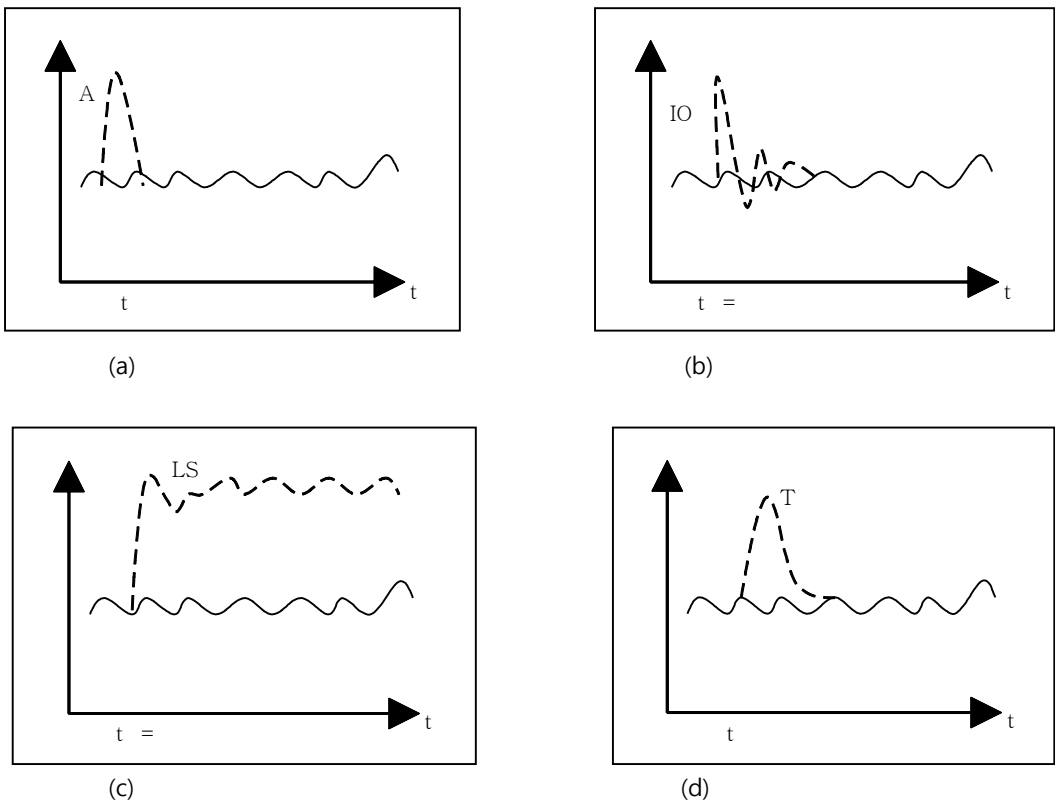


Figure 1. Types of Outliers (a) the plot of additive outlier; (b) the plot of innovation outlier; (c) the plot of level shift; and (d) the plot of temporary change

The difference between AO and IO is that in fact an AO is interpreted as an outlying observation added after the realization to affect a single observation and an IO as an outlying observation added during the realization with influence on all succeeding observations. In autoregressive models, AOs are a cause of much greater concern than IOs because leverage points (outliers in the x-direction) create bigger problems than outliers in the y-direction. For example, in the case of an AR(1) model, one IO yields one outlier in the response variable and a number of "good" leverage points ("good" refers to the fact that the leverage points lie close to the fitted line determined by the majority of the data), which actually improve the accuracy of the parameter estimate. Therefore, one IO only affects one residual.

On the other hand, one AO results in one outlier in the vertical direction and one "bad" leverage point ("bad" refers to the fact that the leverage point does not lie close to the fitted line determined by the majority of the data). Thus, AO also affects the next residual inflating two consecutive residuals.

The important point with IO is that the ARMA(p, q) model is still the exact model for the observations. However, if an outlier occurs at t_0 , then a_{t_0} will affect not only Z_{t_0} , but many future observations. Meanwhile, the effect disappears. Bustos and Yohai (1986) give several results showing that IO does not affect too seriously the OLS estimators of autoregressive and moving average parameters of an ARMA model. To improve this sensitivity to outliers, statisticians began to develop robust estimation methods starting around 1960 (Hampel, 1971).

III. Results and Discussion

The performance of ML and robust procedures in the presence of outlier in an ARIMA model was evaluated in this paper. So, the outlier contaminated series had to be selected. Besides, the performances of robust estimates and ML estimates were compared based on the mean squares error (MSE) criterion.

Most of the export series may contain the outlying observations. Thus, the series such as a yearly export of maize in Myanmar was chosen to analyze the effect of outliers in estimation of parameters of time series model. In this regard, the data were also obtained from the Statistical Year Books which are published by the Central Statistical Organization (CSO) over the period of 1976 to 2008. The plot were shown in Appendix. It can be easily seen from the Appendix Figure A.1 indicates that the

series is nonstationary both in the mean and the variance. First, this series was transformed by taking a logarithmic transformation. Then, the transformed data are plotted in Appendix Figure A.2 and it shows a trend with a constant variance. This trend has to be removed by differencing before a model can be identified. The very slowly decaying sacf was shown in Appendix Table (A.1) and Figure 2 further support to need for differencing. Hence, the sample sacf and spacf for the differenced series are calculated and shown in Appendix Table (A.2) with their plots in Appendix Figure A.3. The sacf tails off and the spacf cuts off after lag 1. It suggests that an ARIMA(1, 1, 0) or ARI(1, 1) is a possible model. Whether the deterministic trend term θ_0 is needed or not, the t-ratio is examined $t = \bar{W} / S_w = 0.09195 / 0.08942 = 1.0283$, which is not significant. Hence, the following ARIMA(1, 1, 0) model is considered as our proposed model:

$$(1 - \phi B)(1 - B)(\ln Z_t - \mu) = a_t \quad (5)$$

and the estimated model is

$$(1 + 0.56 B)(1 - B)(\ln Z_t - 3.69) = a_t \\ (0.1486) \quad (6)$$

where the value in the parenthesis under the estimate refers to the standard error of this estimate.

The residual acf of this fitted model as shown in Appendix Table (A.3) are small and exhibit no patterns. In other words, the residuals from this modified model are white noise. Thus, the fitted ARIMA(1, 1, 0) model is adequate. Although the results all indicate a white noise phenomenon, a white noise series is itself an outlier contaminated series¹⁾. Appendix Figure A.2 shows a single outlier (AO) occurs at time $t = 1988$. So, the ML estimate as shown in (6) is not robust in the presence of AO. Therefore, the robust procedures are used to estimate the parameters of the ARIMA(1, 1, 0) model and results are shown in Table (1). Due to the presence of a single AO outlier, the ML and robust estimates differ substantially. The MSE of ML and robust estimates are greatly different. Besides, the robust estimates are not markedly affected by outlier, whereas the ML procedure is. The ML estimate has the largest MSE among the robust methods in the presence of a single AO outlier. The MSE of RA estimate

1) Wei (1990), Time Series Analysis Univariate and Multivariate Methods, U.S.A: Addison-Wesley Publishing Co., Chapter 9, section 9.5, pp. 203

based on bisquare family (RAB) is the smallest, followed by the MSE of RA estimate based on Huber family (RAH), ACM, GM and M-estimate based on Huber and bisquare respectively. In this study, RAB-estimate is more robust for ARIMA(1, 1, 0) model with a single AO outlier. Therefore, the estimated model becomes

$$(1 + 0.58B)(1 - B)(\ln Z_t - 3.69) = a_t \tag{7}$$

(0.1468)

where the value in the parenthesis under the estimate refers to the standard error of this estimate.

To check model adequacy, the residual acf and pacf and of the fitted model as shown in Appendix Table (A.4) are small and exhibit no patterns. Moreover, the values of Box-Ljung statistic are not significant at 5% level for all lags. So, the fitted ARIMA (1, 1, 0) model in (7) is adequate for the data using RA procedure based on bisquare family. In this study, it is observed that the RAB-estimate is more robust for ARIMA(1, 1, 0) model.

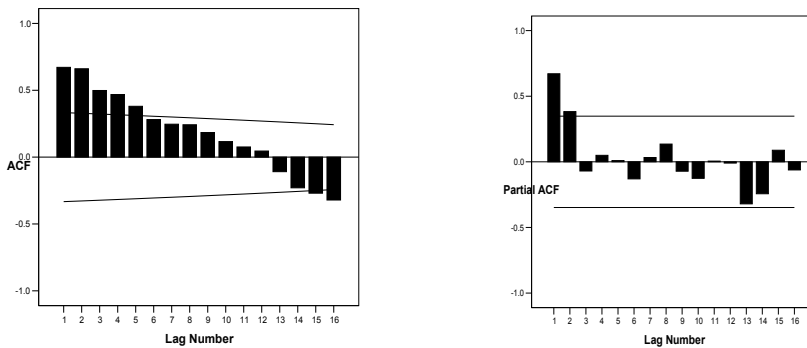


Figure 2. The sacf and spacf for Natural Logarithms of the Export Maize

Table (1) Summary Results of the Maize Export Series

Estimates	$\hat{\phi}$	$Se(\hat{\phi})$	MSE
ML	-0.5597	0.1488	0.6025

MH	-0.6887	0.0984	0.2104
MB	-0.7648	0.0875	0.2283
RAH	-0.5651	0.1494	0.1268
RAB	-0.5758	0.1468	0.1249
GM	-0.7068	0.6283	0.2065
ACM	-0.6794	0.5610	0.1727

Source: Based on calculation

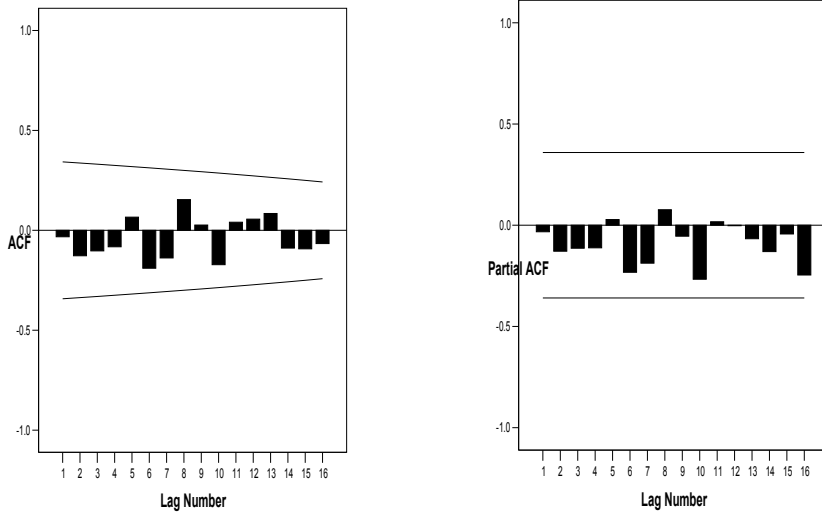


Figure 3. The sacf and spacf for the Residual of the RAB-ARIMA(1, 1, 0) Model
 Source: Appendix Table (A.4)

IV. Conclusion

The present paper tries to explore suitable methods for contaminated data sets in time series analysis. In order to analyze the effect of outliers on the estimation of parameters in times series model, the classical and the robust estimation techniques are used. The performances of these estimators are analyzed by export of maize data. It is found that, this data set contains an AO outlier and the ARIMA(1,1,0) model is fitted to it. Due to the presence of a single AO outlier, it is found that the ML and robust estimates differed substantially. The ML estimate has the largest MSE among the robust methods in the presence of a single AO outlier. The MSE of RA estimate based on bisquare family (RAB) is found to be the smallest; it is followed by the MSE of RA estimate based on Huber family (RAH), ACM, GM and M-estimate based on Huber and bisquare respectively. In this study, the RA estimate based on bisquare family is found to be more robust under the ARIMA(1,1,0) model with a single AO outlier. To sum up, when there are outliers in the data, the robust methods perform better than the classical method.

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Appendix

Table (A.1) The sacf and spacf for Natural Logarithms of the Export of Maize

k	1	2	3	4	5	6	7	8	9	10
$\hat{\rho}_k$	.672	.661	.498	.468	.380	.281	.246	.242	.184	.116
Std Err	.166	.164	.161	.158	.156	.153	.150	.147	.144	.141
$\hat{\phi}_{kk}$	.672	.383	-.070	.050	.010	-.130	.033	.135	-.071	-.126
Std Err	.174	.174	.174	.174	.174	.174	.174	.174	.174	.174

Source: Based on CSO Data

Table (A.2) The sacf and spacf for the Differenced Series of Natural Logarithms of the Export of Maize

k	1	2	3	4	5	6	7	8	9	10
$\hat{\rho}_k$	-.557	.256	-.169	.000	.090	-.112	-.070	.105	.009	-.112
Std Err	.169	.166	.163	.160	.158	.155	.152	.149	.145	.142
$\hat{\phi}_{kk}$	-.557	-.079	-.086	-.172	.025	-.051	-.273	-.065	.106	-.202
Std Err	.177	.177	.177	.177	.177	.177	.177	.177	.177	.177

Source: Based on CSO Data

Table (A.3) Residual acf and pacf of the ARIMA(1,1,0) Model

k	1	2	3	4	5	6	7	8	9	10
$\hat{\rho}_k$	-.045	-.108	-.111	-.077	.077	-.195	-.136	.149	.016	-.171
Std Err	.169	.166	.163	.160	.158	.155	.152	.149	.145	.142
$\hat{\phi}_{kk}$	-.045	-.110	-.123	-.105	.040	-.231	-.188	.084	-.058	-.274
Std Err	.177	.177	.177	.177	.177	.177	.177	.177	.177	.177

Source: Based on CSO Data

Table (A.4) Residual acf and pacf of the RAB-ARIMA(1,1,0) Model

k	1	2	3	4	5	6	7	8
$\hat{\rho}_k$	-.032	-.127	-.103	-.083	.066	-.190	-.138	.154
Std Err	.171	.168	.165	.162	.159	.156	.153	.150
$\hat{\phi}_{kk}$	-.032	-.128	-.114	-.112	.028	-.232	-.187	.077
Std Err	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
k	9	10	11	12	13	14	15	16
$\hat{\rho}_k$	.027	-.172	.041	.056	.084	-.089	-.093	-.066
Std Err	.147	.143	.140	.136	.133	.129	.125	.121
$\hat{\phi}_{kk}$	-.054	-.267	.017	-.002	-.067	-.130	-.043	-.246
Std Err	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180

Source: Based on CSO Data

Table (A.5) Box-Ljung Statistic of the RAB-ARIMA(1,1,0) Model

k	Box-Ljung Statistic	
	Value	Sig. p value
1	0.035	0.851
2	0.607	0.738
3	0.994	0.803
4	1.252	0.870
5	1.424	0.922
6	2.894	0.822
7	3.711	0.812
8	4.762	0.783
9	4.795	0.852
10	6.234	0.795
11	6.318	0.851
12	6.487	0.890
13	6.891	0.908
14	7.366	0.920
15	7.917	0.927
16	8.218	0.942

Source: Based on Calculation

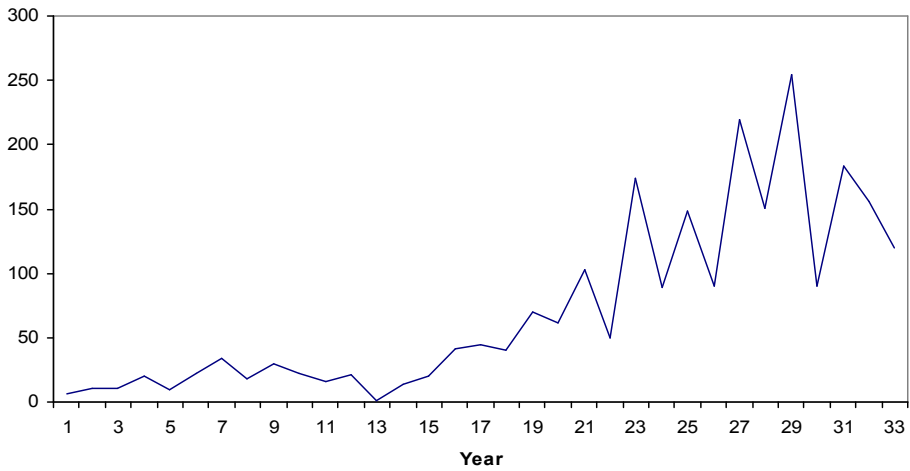


Figure A.1 The Yearly Export of Maize from 1976 to 2008

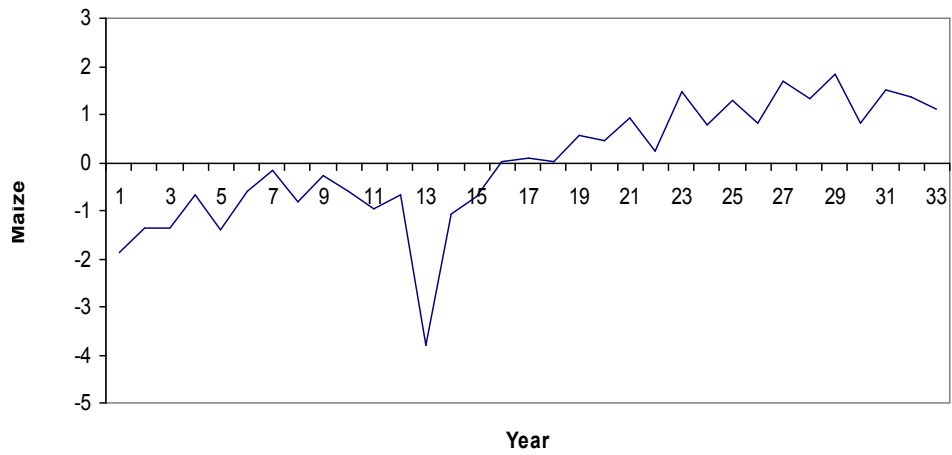


Figure A.2 Natural Logarithms of the Export Maize from 1976 to 2008

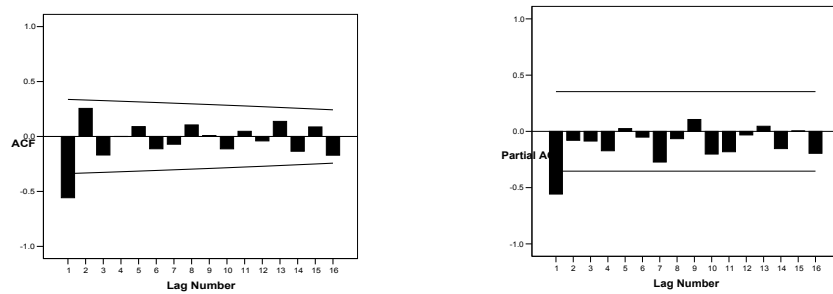


Figure A.3 The sacf and spacf for the Differenced Natural Logarithms of the Export Maize

Source: Appendix Table (A.2)

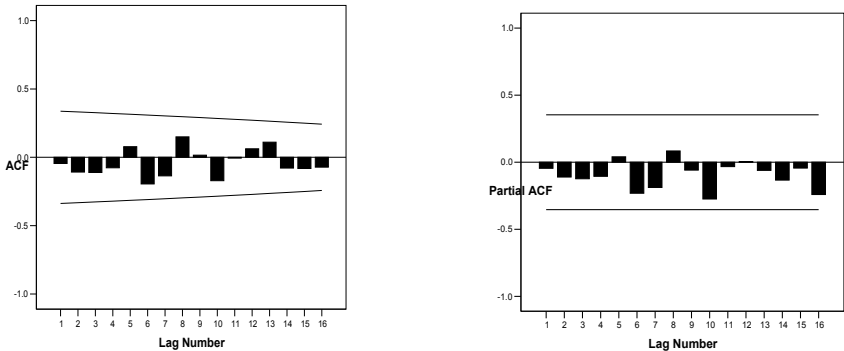


Figure A.4: The sacf and spacf for the Residual of the Fitted RAB-ARIMA(1,1,0) Model
Source: Appendix Table (A.4)

Impact of Mobile Telephones on Rural Livelihoods in Northern Myanmar: A Study of Patheingyi and Madaya Townships, Mandalay Division

Mya Kay Khaing and John Walsh

Shinawatra University

ABSTRACT: The topic of this research is the impact of Mobile telephones on Rural Livelihoods in Northern Myanmar: A Study of Patheingyi and Madaya Townships, Mandalay Division. Survey Questionnaires forms were conducted with 494 respondents from 600 sample size actively involved in and were analyzed using PSPP. The findings of this study are that on telecommunications use, benefits, and constraints in Mandalay Division - has helped illuminate the economic and social impacts of telecommunications market liberalization. Modes of communication are changing, new business ventures are emerging, and mobile phones are becoming a part of everyday life. In this report focuses on not only by exploring the ongoing impacts of increasing telephone access, but also by investigating the constraints imposed by complementary infrastructure, and patterns of internet uptake.

Key Words : Impact, Mobile Phones, Rural Livelihoods, Assets, information Communications Technology, Myanmar

I. Introduction

The advent of Information Communication Technology (ICT) and its subsequent adoption by both the developed and developing countries ushered in the information age. Consequently, information has become a valuable commodity in the global world. Thus, nations that have acquired the necessary ICT infrastructure have been moving rapidly into the post-industrial information-based economy (Alleman, 2005). ICTs are major catalyst for information and knowledge that can create development opportunities and choices for rural communities. These can under certain conditions help to improve the living conditions of the rural poor through better and more sustainable livelihoods strategies (UN, 2004). The application of ICT in different areas of human endeavor has brought about many benefits not only to the individual but also to the community whether in urban or rural areas. Mobile phone which is an

integral part of ICT has become one of the most important media of information communication of our time.

1. Mobile Telephone Usage in Myanmar

The recent introduction of mobile communication in Myanmar is a potentially life-changing prospect for the country, one of the poorest in Southeast Asia. A quarter of its population is estimated to live in poverty, while the country as a whole performs poorly on most socio-economic indicators. There is much potential for mobile phones to play a role in socio-economic development, be it through access to services such as mobile money, or simply the access to information a mobile phone provides. It is estimated that 90% of wards and villages in the country already have a mobile signal.

The Ministry of Posts and Telecom (MPT) began offering mobile services in 2013. In January 2014, the Mobile Telecom Operators which are Ooredoo and Telenor were granted licenses to provide mobile services, with commitments to provide 85% voice coverage within five years. It is expected these new networks will first cover the densely populated urban centers and gradually move outwards to rural areas, which do not currently have coverage.

Myanmar's mobile phone penetration reached 10 percent of the population in 2012-13 while 2013-2014 saw a penetration of 27 percent. The penetration for 2014-2015 is expected to reach 50 percent and continue its growth to 80 percent 2015-2016, according to data from the Ministry of Telecommunications and Information Technology. Using High Speed Packet Access (HSPA)¹ and Long Term Evolution (LTE)² technologies to install mobile communication (GSM) network providers which is operating on the 3G (900MHz spectrum) and 4G LTE (the most advanced Universal Mobile Telecommunications System (UMTS)³ 900 technology).

Myanmar's mobile subscription count grew 87 percent year-on-year, to 10.7 million at end-September 2014, pushing mobile penetration to 19.9 percent, up from 12.5 percent at end-2013, according to global analyst firm Ovum in a press release on March 12. According to Compound Annual Growth Rate (CAGR) of the latest forecast report, mobile subscriptions will grow at a 21 percent, to reach 38.5 million at end-2019, up from 14.8 million at end-2014, as operators expand their networks to new cities and rural areas. Overall, Myanmar's mobile phone penetration rate is now about 60% of the population.

1) HSPA - a 3rd Generation (3G) mobile communication technology offering faster data download speeds at the cost of upload speeds.

2) LTE - a fourth generation (4G) mobile communications standard offering data speeds that are up to 10 times faster than the current 3G network"

3) UMTS - Universal Mobile Telecommunications System is another 3rd Generation (3G) technology that is commonly called W-CDMA (Wideband CDMA). UMTS delivers faster data rates than EDGE due to how the data is coded and the spectral bandwidth used.

Provision of current and up-to-date information to the rural populace on the various activities such as current market prices of goods, market locations, simple food processing, weaving, dyeing, fashion and designing, agricultural practices, etc. for increased productivity and income growth. Generally, information provision increases the resourcefulness of the local users as well as their standard of living. Health Rural tele-density in Myanmar is quite low and this has been attributed to the scarcity of communication infrastructure in most parts of rural Myanmar a scenario that has created the digital divide between the urban and rural areas in Myanmar. This situation has demonstrated the need for extension of ICT infrastructure especially mobile phones to many rural areas in Myanmar with a view to enhancing rural populace access to the benefits of telecommunication infrastructure.

2. About Mobile Telecom Operators in Myanmar

(1) Myanmar Post and Telecommunication (MPT)

According to GSMA Intelligence, MPT, the largest 3G Network in Myanmar, announced a nationwide 3G network expansion upgrade, increasing its 3G coverage to more than 90% of the country's population by early February 2016. According to their reports (Q1 2016), there are 18 million mobile subscriptions with license in the 900MHz and 2.1GHz bands. MPT had a 46 percent market share, while number two Telenor had a 37 percent share and three Ooredoo had a 16.5 percent market share.

(2) Telenor Myanmar

Telenor Myanmar is the second largest mobile subscriptions of the mobile telecom operators in Myanmar. On 30 January 2014, Telenor Group, ready to bring world class telecom services to Myanmar, signed an agreement with Myanmar for a nationwide telecommunications license. According to their reports (Q2 2016), there are 16.889 million mobile subscriptions with license in the 900MHz and 2.1GHz bands, valid for 15 years. Telenor build mobile network using HSPA and LTE-ready technologies and provide network coverage for 94% of the country's population by the end of April, 2016. They launched in Myanmar by switching on the mobile network in Mandalay, the cultural city, on September 27, 2014 and the network is now expanding into other cities and rural areas. And Telenor 4G services is available in Nay Pyi Taw since 7th July 2016 and not available in Yangon, Mandalay and the rest of Myanmar. Voice and data services over 2G and 3G commercially launched as initial offering.

(3) Ooredoo Myanmar

Ooredoo Myanmar, the country's third largest operator, launched 4G service in parts of the country's three major cities — Yangon, Nay Pyi Taw and Mandalay — making it the first to offer the high-speed service. In August, 2014, Ooredoo, the availability of its life-enriching services, signed an agreement with Myanmar for a

nationwide telecommunications license. According to their reports (Q1 2016), there are 6.9 millions mobile subscriptions. Ooredoo's world-class network covered more than 85% of the Myanmar population by the end of April 2016, driven by the company's record investment in 3G and 4G technologies. The plan is to reach 100% coverage until 2019.

3. Mobile Phone and Rural Livelihoods

Understanding people's livelihoods, their motivations behind adoption, and their perceived relative advantage derived from ICTs is vital in understanding the adaptability of these technologies to social, cultural, and economic practices (Kaba, Diallo, Plaisent, Bernard, & N'Da, 2006; Michiels & Van Crowder, 2001). To achieve successful implementation of ICTs in development efforts, it is critical to understand both the impact of the social structure on how technology is adopted and used, and who derives the greatest benefit from its use.

4. Statement of the Problem

Although many researchers see mobile phones in developing countries in a chiefly positive light, the impact of mobile phones on poor people in Myanmar has not been substantiated empirically. That is, there is still a gap in our knowledge on whether mobile phone ownership reduces or increases income poverty, especially among the rural poor. This study takes a critical stance towards the impact of mobile phone ownership on income poverty among the rural area in Patheingyi, Madaya Township, Mandalay. Emphasis is placed on mobile phone related spending among the rural residents and whether or not they forego various development activities for phones. The study is aimed at substantiating whether mobile phones can be said to reduce or increase poverty and mobile phone usage's knowledge in rural areas of Myanmar.

5. Purpose of the study

The purpose of this study is to find out whether the perceived highly publicized mobile phones related growth matches the reality on the ground as economic driver in rural areas or not.

6. Objectives of the study

In pursuant of the above goal, the following specific objective has been raised.

- ✓ To identify the socio-economic characteristics of the respondents;
- ✓ To increase their capability to combine different livelihood assets.

7. Scope of the Study

This study was carried out from the villages in Patheingyi and Madaya Township, Mandalay Division as a representation of Myanmar rural areas.

II. Literature Review

Numerous studies have documented the capability of mobile phones to aid in the achievement of development objectives (see Donner, 2006; Hudson, 2006; Saunders et al., 1994). The following section highlights some of the research that has focused on the uses of mobile phones for rural development in developing countries. The adoption of mobile phones in rural area highlighted the ability of mobile phones to provide information advantage and encourage greater efficiency.

1. Linkage between ICTs such as mobile phone, livelihoods and poverty reduction in developing countries

The link between ICTs such as mobile phones, livelihoods and poverty stems from the recognition that information is a critical factor for development purposes. Mobile phones have the potential to amplify the speed and ease, and to introduce new modes with which information is communicated. Accelerated communication of information, in the interplay with other factors, can increase productivity; enhance access to services; widen markets; simplify transactions; substitute for physical transport; prevent crime; improve governance. Since there are many ways in which mobile phones can contribute to people's livelihoods and poverty reduction, understanding these linkages depends greatly on, among other things, how poverty and livelihoods are conceptualized and defined (Souter et al., 2005; Braun and Torero, 2006; McNamara, 2008). Being poor also means lack of necessary information and communication channels to convert one's own resources into value-creating activities (McNamara, 2003). Livelihoods also entail the means, activities, entitlements and assets by which people make a living (Chambers, 1995).

This study reported that mobile phones were being used to maintain social networks and provide access to information on socio-economic opportunities and were reducing travel needs, assisting job searching, improving access to business information, and contacts with families and friends as more evident in emergencies, social networks, and saving costs and time. Moreover, many farmers were able to exploit new mobile phone-based services to seek information on market prices.

Considering the importance of local conditions and realities in this kind of research,

this study was necessary to understand the extent to which mobile phones contribute to rural livelihoods in Mandalay region. It is important to note that this was a cross-sectional study that measured people's experiences with the usage of mobile phones for their livelihoods at one point in time. Because of the complex and multidimensional nature of livelihoods, this study employed the Sustainable Livelihood Framework (Fig. 1), which served as a checklist of poverty and livelihood issues that were considered in the study.

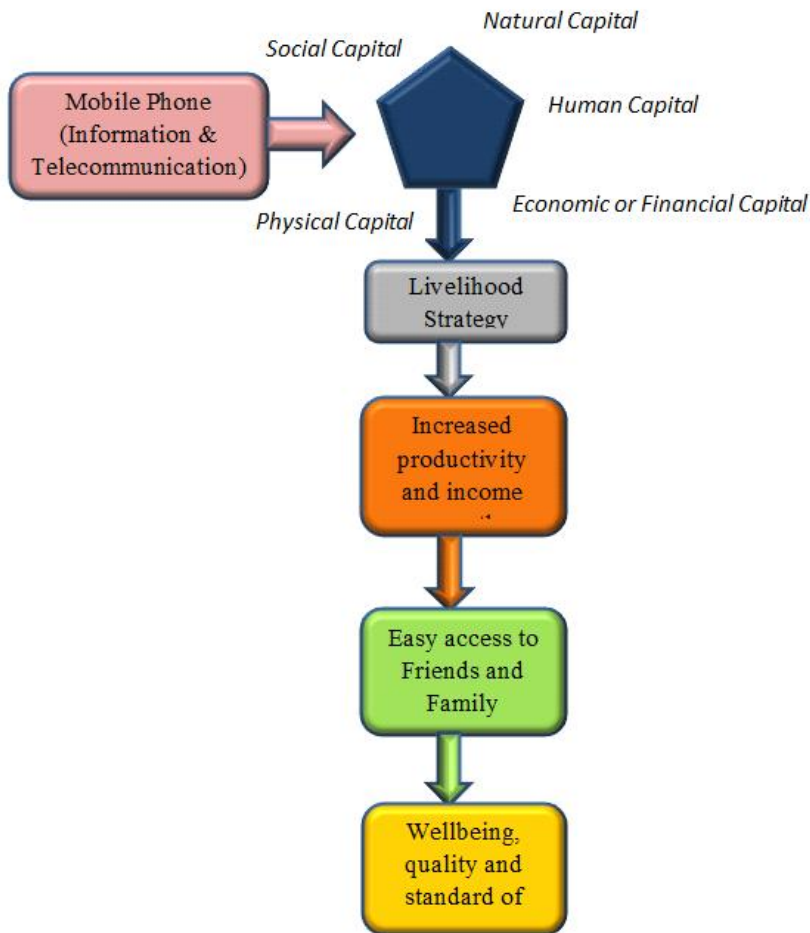


Fig. 1 - Sustainable Livelihood Framework

2. Livelihood Framework or Theoretical Framework

The livelihood model as propounded by *Soussan et al.*, (2000) captures the factors

that influence the livelihood strategies of the rural poor as shown in Figure 1. These livelihood assets represent a potential, a set of possibilities for the household to secure a livelihood but they do not automatically define that livelihood because the extent to which their potential is realized depend upon the way that they are used. This is reflected in a set of decisions on what assets to utilize, when, decisions that together constitute the livelihood strategy of the household. The choices made in the strategy will in turn determine the livelihood activities of each rural household. Rural household's members thus earn increasing productivity. This income is growth in turn allocated through a second key set of decisions called the income strategy. Income can be allocated to easily access to friends and family connection and then this sustainable livelihood strategy can be supported to get wellbeing, quality and standard of living. This process is affected by the wider natural context including the natural resources, environment and climate. This in turn influenced the vulnerability context which defines the specific impact of external forces on the livelihood system of particular households.

The technological environment is a fundamental factor that can affect the livelihood strategies of any community whether in the urban or rural community. I propose that the current model of livelihood framework is non-specific and did not recognize the importance of the technological environment as a major factor influencing rural livelihoods. The scenario is connected with the regency in the adoption and utilization of mobiles telephones in both the urban and rural areas in Myanmar. The few available studies were carried out in other countries where the use of the technology has spanned some decades. Most of these studies attempt to establish a causal link between mobile communication adoption and usage and economic growth. Only one of the studies focuses on social capital and economical capital, which are just two aspects of livelihood assets.

3. Conceptual Framework

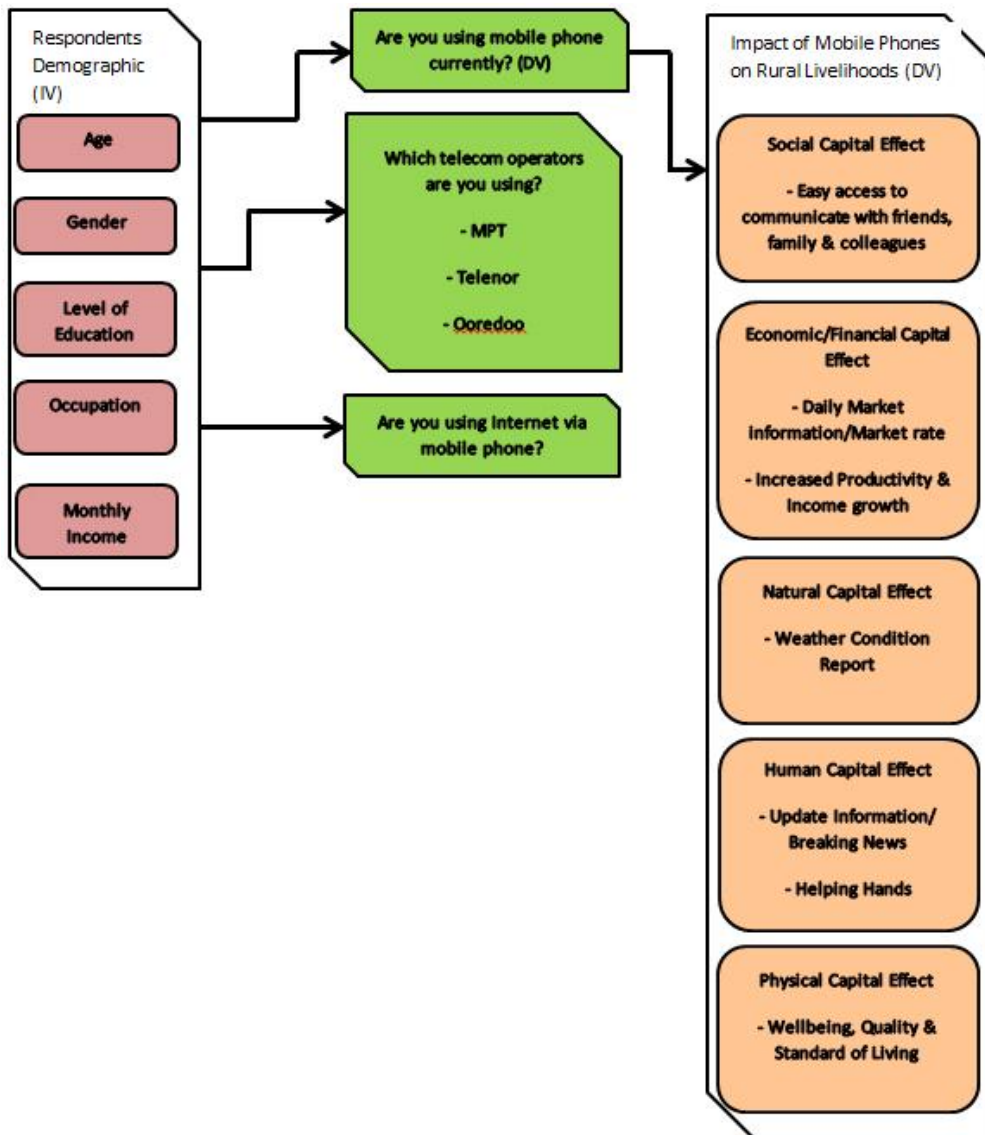


Fig. 2 – Conceptual Framework

III. Research Methodology

1. Data Collection

The data was collected for mobile phone users in the rural areas Mandalay Division of Myanmar with the help of Department of Rural Development of the Ministry of Agriculture, Livestock and Irrigation visited 5 villages in two rural area townships, namely Patheingyi and Madaya Townships which are nearby Mandalay. These villages were selected based on the fact that economic and social activities flourish in them. The rural dwellers always use the GSM to communicate with those of their friends and relatives in far places to give them current information concerning about each of them. In the same manner, in economic activities also communicate with their customers on how to sell their products, contact others for market prices.

Using convenience sampling technique, participants who willingly agreed to be answered in an interview as a survey questionnaire's form were selected. In total, 494 respondents voluntarily agreed to participate in the study. The total survey forms lasted for about one week. Some open-ended questions were used in survey form. Survey Questionnaire method was chosen to collect data because in the rural areas not every person that owns a phone can read and write, but also most of them cannot read English version of survey questionnaire form so that using the form of Myanmar version but they know how to tick which answers will be appropriate with them.

2. Population of the Study

The study was conducted in Bant Tin, Lat Thit, Zee Cho Kone in Patheingyi Township, Mandalay District and Myaung Thit, Tha Phane Kine Village in Madaya Township, Pyin Oo Lwin District. Total populations of these five villages are 8,596 people. They are a Farming (Agriculture) district and the major source of income is rice farming, where products are transported to the whole country. Myanmar Post and Telecommunication (MPT), Telenor Myanmar and Ooredoo Myanmar as Mobile service providers dominate the area with approximately 90% mobile network coverage each.

3. Sample size and Sampling technique

This study is approached by Quantitative research technique and analyzed by PSPP software which is provided by Prof. Dr. John Walsh. The breakdown of the respondents by village is as follows:

- 105 respondents from Bant Tin village in Patheingyi Township, Mandalay District
- 100 respondents from Lat Thit village in Patheingyi Township, Mandalay District
- 98 respondents from Zee Cho Kone village in Patheingyi Township, Mandalay District
- 96 respondents from Myaung Thit village in Madaya Township, Pyin Oo Lwin District
- 95 respondents from Tha Phane Kine village in Madaya Township, Pyin Oo Lwin District

According to collected data, Male respondents are 293 persons (59.31%), Female respondents are 199 persons (40.28%) and others are 2 persons (0.40%) respectively. Among the respondents that participated in the survey data, many women are not using mobile phones because of the cost of making a phone call and their lack of knowledge of how to use the devices, men are more likely than women to use mobile phones for business purposes, and that women are more likely to use mobile phones for kinship maintenance.

4. The Interview Questionnaire

The interview questionnaire form included questions designed to secure information about:

- Individual characteristics (i.e., age, gender, education level, occupation and monthly income)
- Why Individual do not use mobile phone (i.e., extra money, extra time, unfamiliar with technology, share with other family members)
- Livelihood descriptors (i.e., Social, Economic, Natural, Human and Physical Capital effect)
- Individual use of mobile telephony for what purposes (i.e., social media, information update, phone calling/receiving and text message, weather forecast, listening music, photo taken)
- The condition of network coverage/mobile connection in area (i.e., Mobile telecom operators in Myanmar such as MPT, Telenor, Ooredoo)

IV. Results

1. Introduction

This section focuses on presentation and analysis of data from respondents. It also interprets findings of the study. The results of this study are derived from the questionnaire data using quantitative methods. Almost all questions were answered. The data obtained from the respondents was analyzed as presented below.

2. Demographic Information of the respondents

Table 1 Respondent's Personal Information

Age	Frequency	Percent
14-20	63	10.50
21-30	156	26.00
31-40	124	20.67
41-50	94	15.67
51-60	43	7.17
61 and above	14	2.33
Gender	Frequency	Percent
Male	293	48.83
Female	199	33.17
Other	2	0.33
Level of Education	Frequency	Percent
Non-education	14	2.33
Primary Level	151	25.17
Secondary Level	180	30.00
Higher Level	78	13.00
College/University Level	23	3.83
Graduated/Master Level	48	8.00
Occupation	Frequency	Percent
Agriculturist	225	37.50
Trader/Business man	17	2.83
Student/Teacher	57	9.50
Non-working	61	10.17
Government/Company Staff	44	7.33
Other	90	15.00
Monthly Income	Frequency	Percent
No income	92	15.33
Below 50,000Kyats	33	5.50
50,000- below200,000Kyats	309	51.50
200,000-	53	10.73

below400,000Kyats		
400,000- below600,000Kyats	7	1.17
600,000Kyats and above	0	0

Table 1 show total 494 respondents (82.3% out of 100%) who were surveyed during data collection process. In the sample, the largest age of respondents is the range of 21-30(26%) years old and about gender is Male (48.83%). In this gender, other means gay or tomboy. The highest level of education of respondents is secondary level (30.00%), the maximum monthly income of respondents is the range between 50,000 kyats and 200,000 kyats (51.50%) and nobody gets 600,000Kyats and above for monthly income (0%).

As we all know, in Myanmar, Agriculture is the main industry in the country so that most of the respondents' occupation is agriculturist (37.50%) that is nearly half population among all respondents. In this occupation, other occupations mean as masonry, carpenter, tailor, broker and vendor. According to level of education, in rural Myanmar, the lack of transportation and adequate roads makes access to many villages difficult. Teachers and students often have long and difficult journeys to get to school every day, so the result of level of education in rural villages could be effort only until secondary level.

3. Findings on Mobile Phone User and their demographics

Table 2 – Mobile Phone User and Age

Are you using mobile phone currently?						
Age	Yes		No		Last time used but not now	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
14-20	45	9.10%	15	3.04%	3	0.61%
21-30	148	29.96%	6	1.21%	2	0.40%
31-40	114	23.08%	7	1.42%	3	0.61%
41-50	89	18.02%	4	0.81%	1	0.20%
51-60	36	7.29%	6	1.21%	1	0.20%
61 and above	5	1.01%	9	1.83%	0	0%
N	437	88.46%	47	9.52%	10	2.02%
Value	79.98					
Assumption Sig.	0.000					

Table 3 – Mobile Phone User and Gender

Are you using mobile phone currently?						
	Yes		No		Last time used but not now	
Gender	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	271	54.86%	17	3.44%	5	1.01%
Female	164	33.20%	30	6.08%	5	1.01%
Other	2	0.40%	0	0%	0	0%
N	437	88.46%	47	9.52%	10	2.02%
Value	12.72					
Assumption Sig.	0.013					

Table 4 – Mobile Phone User and Level of Education

Are you using mobile phone currently?						
	Yes		No		Last time used but not now	
Level of Education	Frequency	Percent	Frequency	Percent	Frequency	Percent
Non-education	5	1.01%	8	1.64%	1	0.20%
Primary Level	133	26.92%	14	2.83%	4	0.81%
Secondary Level	164	33.20%	14	2.83%	2	0.40%
Higher Level	66	13.36%	9	1.82%	3	0.61%
College/University Level	21	4.25%	2	0.40%	0	0%
Graduated/Master Level	48	9.72%	0	0%	0	0%
N	437	88.46%	47	9.52%	10	2.02%
Value	49.86					
Assumption Sig.	0.000					

Table 5 – Mobile Phone User and Occupation

Are you using mobile phone currently?						
	Yes		No		Last time used but not now	
Occupation	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculturist	205	41.50%	15	3.04%	5	1.02%
Trader/Businessman	17	3.44%	0	0.00%	0	0.00%
Student/Teacher	47	9.51%	8	1.62%	2	0.40%
Non-working	38	7.69%	21	4.25%	2	0.40%
Government/Company Staff	44	8.91%	0	0.00%	0	0%
Others	86	17.41%	3	1%	1	0.20%
N	437	88.46%	47	9.52%	10	2.02%
Value	61.66					
Assumption Sig.	0.000					

Table 6 – Mobile Phone User and Monthly Income

Are you using mobile phone currently?						
Monthly Income	Yes		No		Last time used but not now	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No income	58	11.74%	29	5.87%	5	1.01%
Below 50,000Kyats	24	4.86%	6	1.23%	3	0.61%
50,000-below200,000Kyats	297	60.12%	10	2.02%	2	0.40%
200,000-below400,000Kyat	51	10.32%	2	0.40%	0	0.00%
400,000-below600,000Kyat	7	1.42%	0	0.00%	0	0%
600,000Kyats and above	0	0.00%	0	0%	0	0.00%
N	437	88.46%	47	9.52%	10	2.02%
Value	92.43					
Assumption Sig.	0.000					

For Q(F), most of the people are using mobile phone currently but not everyone and for some people, mobile phone was used last time in rural villages. From data analysis of their demographic information, the largest age of mobile phone users is 21-30 (29.96%) (Table 2). Although the study aimed at having an equal number of genders among respondents, it is noted that fewer females are sampled who own/use mobile phones than males who own/use mobile phones. From the findings 54.86% males are owning/using mobile phones while female are 33.20% (Table 3).

Of the mobile phone users in rural areas, the education level seems with secondary level leading with 33.20% (Table 4). In the occupation sample (Table 5), some of the villagers who have non-working do not use mobile phone as no monthly income for those people. And according to this data result, it is noted that for those using mobile phone who are living in rural villages, their monthly income ranging is 50,000 kyats to 200,000 kyats (60.12%) among all respondents (Table 6).

4 Findings on Mobile Telecom Operators and User's demographics

Table 7. Mobile Telecom Operators and User's Age

Which mobile telecom operators are you using?						
Age	MPT		Telenor		Ooredoo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
14-20	15	5.60%	30	11.58%	14	13.59%
21-30	88	32.83%	87	33.59%	40	38.83%
31-40	81	30.22%	70	27.03%	28	27.20%
41-50	57	21.27%	53	20.46%	17	16.50%
51-60	24	8.96%	16	6.18%	4	3.88%
61 and above	3	1.12%	3	1%	0	0.00%
N	268	100.00%	259	100.00%	103	100.00%
Value	88.39		74.02		87.46	
Assumption Sig.	0.000		0.000		0.000	

Table 8 – Mobile Telecom Operators and User's Gender

Which mobile telecom operators are you using?						
Gender	MPT		Telenor		Ooredoo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	172	64.18%	165	63.71%	55	53.40%
Female	96	35.82%	93	35.91%	47	45.63%
Other	0	0.00%	1	0.38%	1	0.97%
N	268	100.00%	259	100.00%	103	100.00%
Value	17.56		13.82		18.36	
Assumption Sig.	0.002		0.008		0.005	

Table 9 – Mobile Telecom Operators and User's Level of Education

Which mobile telecom operators are you using?						
Level of Education	MPT		Telenor		Ooredoo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Non-education	0	0.00%	3	1.16%	2	1.94%
Primary Level	79	29.48%	70	27.02%	20	19.42%
Secondary Level	88	32.40%	101	39.00%	40	38.83%
Higher Level	45	16.79%	46	17.76%	15	14.56%
College/University Level	15	5.60%	7	2.70%	10	9.72%
Graduated/Master Level	41	15.73%	32	12%	16	15.53%
N	268	100.00%	259	100.00%	103	100.00%
Value	73.33		63.12		67.83	
Assumption Sig.	0.000		0.000		0.000	

Table 10 – Mobile Telecom Operators and User's Occupation

Which mobile telecom operators are you using?						
Occupation	MPT		Telenor		Ooredoo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculturist	127	47.38%	116	44.74%	43	41.75%
Trader/Businessman	14	5.22%	11	4.30%	3	2.91%
Student/Teacher	34	12.69%	25	9.65%	17	16.50%
Non-working	15	5.60%	26	10.04%	11	10.68%
Staff	34	12.69%	28	10.81%	7	6.80%
Others	44	16.42%	53	20%	22	21.36%
N	268	100.00%	259	100.00%	103	100.00%
Value	76.75		58.51		63.88	
Assumption Sig.	0.000		0.000		0.000	

Table 11 – Mobile Telecom Operators and User's Monthly Income

Monthly Income	Which mobile telecom operators are you using?					
	MPT		Telenor		Ooredoo	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No income	28	10.45%	35	13.51%	17	16.50%
Below 50,000Kyats	8	2.99%	22	8.49%	3	2.91%
50,000-below200,000Kyats	182	67.91%	166	64.09%	75	72.82%
200,000-below400,000Kya	43	16.04%	32	12.36%	7	6.80%
400,000-below600,000Kya	7	2.61%	4	1.54%	1	0.97%
600,000Kyats and above	0	0.00%	0	0%	0	0.00%
N	268	100.00%	259	99.99%	103	100.00%
Value	108.12		88.15		85.69	
Assumption Sig.	0.000		0.000		0.000	

According to Q(J) versus respondent's demographics, MPT is the most using as mobile telecom operators in rural area. User's age which is using MPT is between 21-30, Male, Agriculturist and their income is ranging between 50,000 to below 200,000 kyats per month. Ooredoo's customer's age is not over 60. For user's level of education, secondary level is the most users who is using Telenor network. (see Table 7,8,9,10 and 11)

Table 12 – The relationship between network condition and mobile telecom operators

Mobile Telecom Operators	How is the condition of network coverage/mobile connection in your area? (Rs) Which mobile telecom operators are you using?							Assumpti on Sig.
	Good		Moderate		Bad		N	
	Frequency	Percent	Frequency	Percent	Frequency	Percent		
MPT	130	48.51%	138	51.49%	0	0%	268	0.000
Telenor	133	51.35%	122	47.10%	4	1.54%	259	0.000
Ooredoo	56	54.37%	46	44.66%	1	0.97%	103	0.000

For Q(I) and Q(J), overall network coverage in these rural areas might have been Good connection that means Myanmar's telecommunications industry has changed dramatically over the past two years, enabling millions to get connected. Moreover, MPT user is the most population (n=268) and the second most user is Telenor (n=259) (Table 12).

5. Findings on Internet User and their demographics

Table 13 – Internet User and their Age

Are you using Internet via mobile phone?						
Age	Yes		No		Do not know how to use	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
14-20	32	6.48%	13	2.63%	1	0.20%
21-30	132	26.72%	14	2.83%	2	0.40%
31-40	100	20.24%	13	2.63%	2	0.40%
41-50	69	13.97%	18	3.64%	3	0.61%
51-60	16	3.24%	16	3.24%	4	0.81%
61 and above	2	0.40%	0	0.00%	0	0.00%
N	351	71.05%	74	14.97%	12	2.42%
Value	116.99					
Assumption Sig.	0.000					

Table 14 – Internet User and their Gender

Are you using Internet via mobile phone?						
Gender	Yes		No		Do not know how to use	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	216	43.72%	45	9.72%	9	1.82%
Female	134	27.13%	28	5.66%	3	0.60%
Other	1	0.20%	1	0.20%	0	0.00%
N	351	71.05%	74	15.58%	12	2.42%
Value	15.61					
Assumption Sig.	0.016					

Table 15 – Internet User and their Level of Education

Are you using Internet via mobile phone?						
Level of Education	Yes		No		Do not know how to use	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Non-education	1	0.20%	4	0.81%	0	0.00%
Primary Level	99	20.04%	27	5.67%	8	1.62%
Secondary Level	130	26.32%	29	6.28%	4	0.80%
Higher Level	56	11.34%	10	2.02%	0	0.00%
College/University Level	19	3.85%	2	0.40%	0	0.00%
Graduated/Master Level	46	9.30%	2	0.40%	0	0.00%
N	351	71.05%	74	15.58%	12	2.42%
Value	74.54					
Assumption Sig.	0.000					

Table 16 – Internet User and their Occupation

Are you using Internet via mobile phone?						
Occupation	Yes		No		Do not know how to use	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculturist	155	31.38%	42	8.70%	9	1.82%
Trader/Businessman	17	3.44%	0	0.00%	0	0.00%
Student/Teacher	42	8.50%	5	1.01%	0	0.00%
Non-working	24	4.86%	11	2.63%	2	0.40%
Staff	39	7.89%	5	1.01%	0	0.00%
Others	74	14.98%	11	2.23%	1	0.20%
N	351	71.05%	74	15.58%	12	2.42%
Value	78.33					
Assumption Sig.	0.000					

Table 17 – Internet User and their monthly Income

Are you using Internet via mobile phone?						
Monthly Income	Yes		No		Do not know how to use	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No income	40	8.10%	17	3.64%	2	0.40%
Below 50,000Kyats	15	3.04%	7	1.82%	1	0.20%
50,000-below200,000Kyats	246	49.80%	45	9.11%	6	1.21%
200,000-below400,000Kyat	43	8.70%	5	1.01%	3	0.61%
400,000-below600,000Kyat	7	1.41%	0	0.00%	0	0.00%
600,000Kyats and above	0	0.00%	0	0.00%	0	0.00%
N	351	71.05%	74	15.58%	12	2.42%
Value	97.41					
Assumption Sig.	0.000					

According to this crosstab, Internet user is total 351 people out of mobile user 437. The rest do not use internet and some doesn't know how to use internet. The most internet users are the age of 21-30, Male, Agriculturist and their income is middle range 50,000- below 200,000 kyats per month. And they have the secondary level of education. (see Table 13,14,15,16 and 17)

Table 18. The relationship between using Internet and the reasons why using mobile phone in the most of the times

Are you using Internet via mobile phone? (Rs) What are the reasons why you are using mobile phones in the most of the times?							
	Yes		No		Do not know how to use		
The reasons why using mobile phones in most of the times	Frequency	Percent	Frequency	Percent	Frequency	Percent	N
Social media	272	100%	0	0%	0	0%	272
Information Update	193	99.48%	0	0.52%	0	0%	193
Weather forecast	72	98.63%	1	1.37%	0	0%	73
Phone calling/receiving and Text message	316	78.02%	77	19.01%	12	2.96%	405
Listening Music	132	85.71%	19	12.34%	3	1.95%	154
Photo Taking	130	87.84%	17	11.49%	1	0.68%	148

Although the respondents are using mobile phone, some of them did not use internet by phone and they are just using mobile phone especially for phone calling/receiving and text message (n=405) (Table 18). The relationship between using Internet Q(K) and the reasons why using mobile phone in the most of the times Q(L), it is noted that for those respondents using internet is for social media (n= 272) and information update (breaking news) (n=193). The least reason is that they did not choose for weather forecasting even most to them are agriculturists. It might be assumed that they are not familiar with how to check the weather forecast by internet.

6. Findings on Impact of mobile phones on Rural Livelihoods

Table 19. The relationship between Mobile Phone using and impact of it on rural livelihoods

Impact of Rural Livelihoods						
		Social Capital Effect	Economic/Fi nancial Capital Effect	Natural Capital Effect	Human Capital Effect	Physical Capital Effect
Mobile Phone Using	Frequency	427	110	88	113	183
	Percentage	46%	12%	10%	12%	20%
	Assmption Sig.	0.000	0.000	0.000	0.000	0.000

- Social Capital Effect ~ Easy access to communicate with friends, family and colleagues
- Economic/Financial Capital Effect ~ Receive daily market information/ market rate
- Natural Capital Effect ~ Report weather condition for farmers/fishers and others who is travelling to urban areas by daily
- Human Capital Effect ~ Information Updates, Breaking news updates
- Physical Capital Effect ~ Helping Hands

For Q(M), social capital effect (46%) is the maximum impact of mobile phone usage in their rural daily life. Rural dwellers are using mobile phone in most of the times for easy access to communicate with friends, family and colleagues. And the second most useful is for physical capital effect (20%) especially for their health (Helping Hands). The rest percentages are for economic capital effect (Receive daily market information/ market rate) (12%), natural capital effect (Report weather condition for farmers/fishers and others who is travelling to urban areas by daily) (10%) and human capital effect (Information Updates, Breaking news updates) (12%) respectively (Table 19 and Fig. 3)

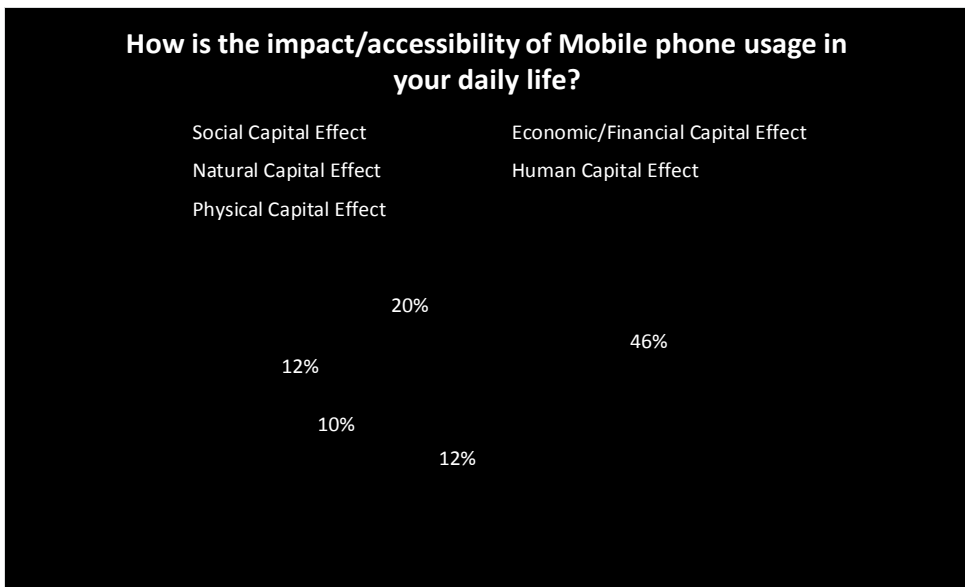


Fig. 3 - Percentage of impact of mobile phone usage in daily life

7. Findings on other questionnaires

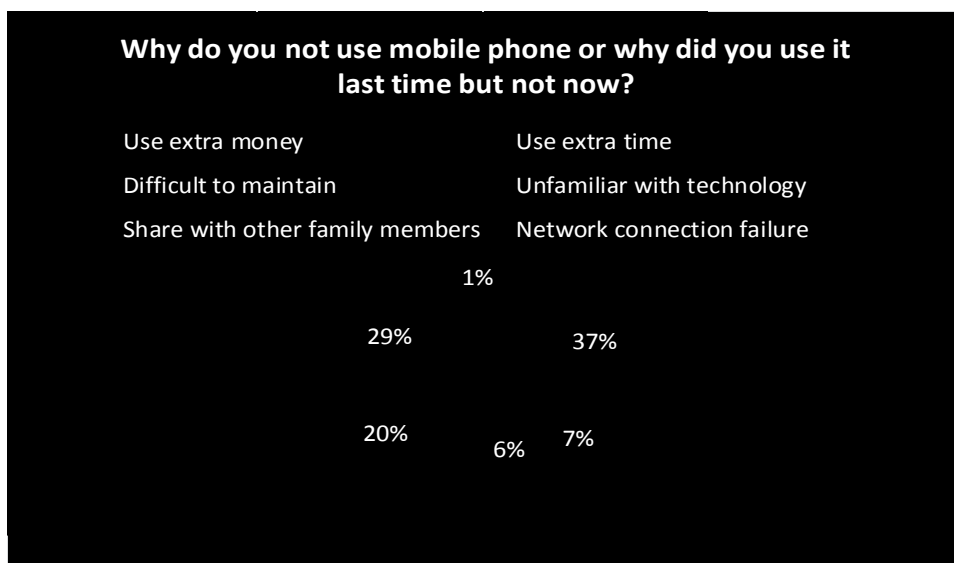


Fig. 4 – Percentage of why not use mobile phone

For Q(G), according to the respondents' answers, some villagers do not use mobile phone because they are reasoning about these facts such as using extra money and

time, difficult to maintain mobile phone and unfamiliar with its technology. 37% of them are they do not want to use extra money and they could share with other family members which they support mobile phone is not necessary for their life what they answered. The least reason is the network connection failure (1%) (Fig. 4).

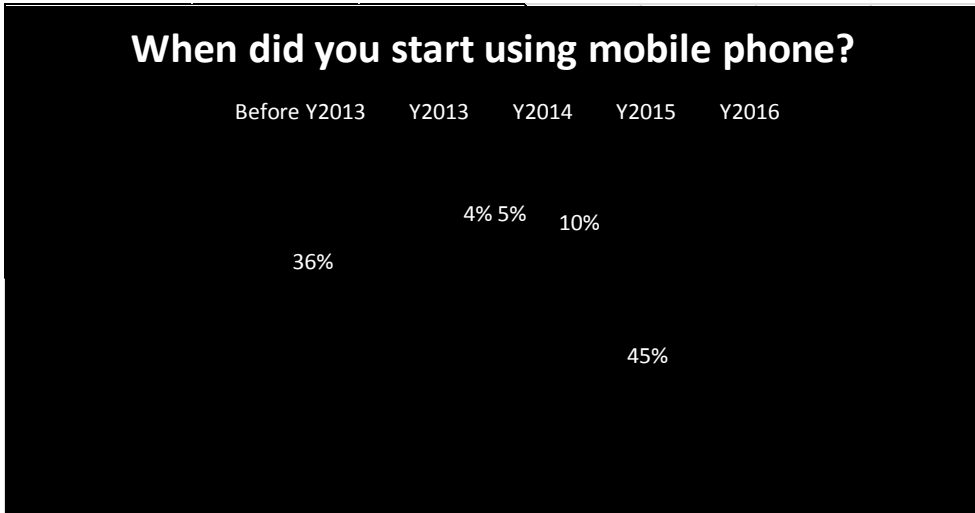


Fig. 5 – Percentage of when mobile phone users start using

For Q(H), according to the survey questionnaires, most of the mobile phone owners started using mobile phone in Year 2014 (45%). As mentioned above that the Ministry of Posts and Telecom (MPT) began offering mobile services in 2013 and in January 2014, the Mobile Telecom Operators which are Ooredoo and Telenor were granted licenses to provide mobile services. Myanmar’s mobile subscription count grew 87 percent year-on-year, to 10.7 million at end-September 2014.

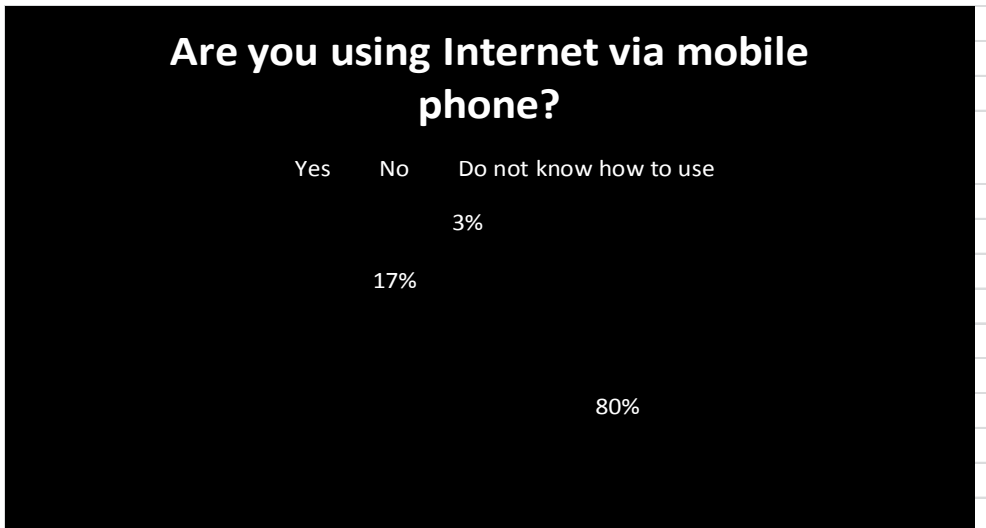


Fig. 6 – Percentage of using Internet by phone

For Q(K), the 80% of mobile phone owners are using internet by phone. The reason why some people do not use internet will be continued to discuss in below and some answered “do not know how to use internet” (Fig. 6).

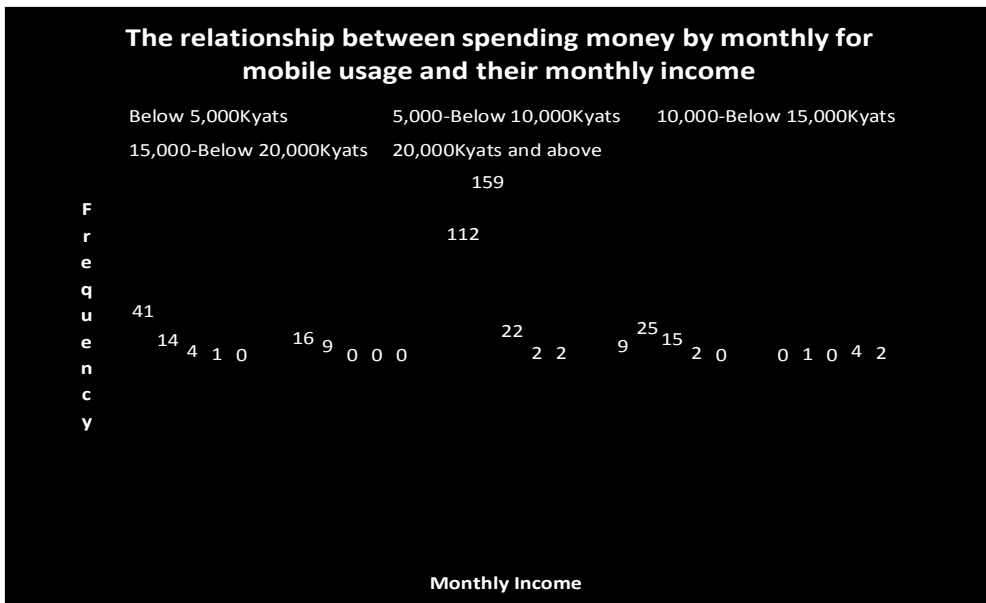


Fig. 7. The relationship between spending money by monthly for mobile usage and their monthly income

For Q(N), as mentioned above, monthly income for most of rural dwellers is ranging between 50,000 and below 200,000 kyats and they use to spend the maximum amount for mobile usage from 5,000 kyats to 10,000 kyats by monthly. Then the second maximum amount for it is below 5,000 kyats.

Work as overtime	64				
Save from daily expenditure	185				
Wait for promotion that is supported by mobile telecom operators	193				
Do the other ways	66				

Fig. 8 – Percentage of how to earn to get extra money for mobile usage

For Q(O), most of the respondents think they need to find out extra money to get mobile usage amount by monthly and how they try to earn to get this using amount for mobile phone is wait for promotion that is supported by mobile telecom operators (38%) and save from daily expenditure (36%). The percentage of work as overtime and do the other ways are equal (13%).

V. Conclusion and Suggestion

The findings in this study have shown that mobile phones provide rural households with fast and easy modes of communication, thereby increasing their ability to access livelihood assets, undertake diverse livelihoods strategies, and overcome their vulnerabilities. The phones contribute to reduce poverty and improve rural livelihoods through a number of ways. First, by expanding and strengthening social networks; increase people’s ability to deal with emergencies and to work together thereby reducing costs and increasing productivity. Secondly, mobile phones enable rural people to cut down travel costs; easy access to communicate with their other family

members who are working in other cities. Thirdly, mobile phones help rural traders and farmers to secure better markets and prices; save time and money; and promptly communicate business-related information. However, mobile phones have not made important contributions to improve incomes of rural households.

Mobile phone services have come to stay and will remain to boost the economy, attract foreign direct investment as well as encourage the local private sector, growth business productivity, enhance social interactions and family relationships and create job opportunities. Mobile has become the most easily accessible and ubiquitous communications device in rural areas. Easy availability of low priced new handsets with basic features and emergence of secondary markets for used devices, whose prices are even lower, make them within reach for even the poorest of the poor. Challenges such as absence of electricity in the rural areas, uneasy to buy billing cards, and high charges by mobile telecom operators who are those should have to reduce price as long as every people could use it were mentioned as some problems facing the use of mobile phones in the rural villagers in Myanmar.

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An Analysis of the Investment Environment in Myanmar*

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ABSTRACT: Myanmar has a geopolitical strategic position with borders with China and India. With low labor force and abundant natural resources, it is a country with a great potential for development due to its close proximity to neighboring countries. Agricultural production has great potential as well as potential for natural resource development. The country also has abundant resources, large areas and about 60 million consumers. Therefore, the possibility of domestic economic development is very high. And also, Myanmar has become a promising market and investment area by mitigating economic sanctions by the international community and by major nations. Korea is a mutually complementary relationship between successful industrial experience and Myanmar 's abundant natural resources and development potential. Korea is interested in Myanmar 's energy resources, and Myanmar also wants greater Korean investment. In this study, the investment environment of Myanmar is analyzed and implications for investment in Myanmar are derived.

Key words : Myanmar Economic Environment, Foreign Investment Law, Economic Sanctions, Managed Floating Exchange Rate Regime, Investment Environment, Mutual Cooperation

I. Introduction

Myanmar is located in a geopolitically strategic position as it borders China, India, Thailand, Laos, Bangladesh and other countries. It is a nation with great development potential due to its proximity to the market advancements of nearby countries brought about by an inexpensive labor force and abundant natural resources. Its agricultural production has great potential, as well as a high possibility of natural

* This paper is the development of the paper presented at the 3rd YUE-KOMYRA International Conference in October, 2014.

resource development. The country also has plentiful resources, a wide territory and some 60 million consumers. Therefore, the possibility of expansive domestic economic development is very high.¹⁾

After the inauguration of new government in 2011, investments in construction, infrastructure and manufacture increased due to greater expectations in a more open economy, foreign investment expansion, lifting of Myanmar's economic sanctions, the Generalized Scheme of Preferences (GSP) and economic development. The United States' economic sanctions against Myanmar, which was the biggest obstacle for Myanmar's economic development, was lifted due to the US visit of Pres. Thein Sein and Mrs. Suu Kyi. However, arms and jewelry trade, the Most Favored Nation Tariff, individuals and countries belonging to Specially Designated Nationals (SDN) of United States, as well as organizations with possession of majority of shares by those belonging to SDN were still maintained, which in turn prohibits transacting with the United States.

Myanmar's economy is expected to continue to open and grow since the number of organizations and individuals in SDN is lessening. Prices of commodities experienced high inflation rates of above 20% the annual average in 2008, but it was stabilized to below 4% in 2009. However, after the inauguration of new government in 2011, inflation rate was at 6% and is expected to increase to 6.9% in 2014 as reported by the EIU. This is many due to the fact that money supply is expanding because of an increased expectation for economic recovery and foreign development. The manufacturing and agricultural sectors, which are supported by Myanmar's Generalized Scheme of Preferences (GSP), are expected to develop because of an increase in foreign investment, as well as the growth in electrical and petroleum gas sectors.

In 2012, the United States lifted its economic sanctions against Myanmar for every sector, with the exception of removal from Generalized Scheme of Preferences (GSP) and the inhibition of arms exports. The sanctions of the United States against Myanmar are shifting from comprehensive sanctions to selective sanctions for Specially Designated Nationals, as managed by the Bureau of Foreign Assets Statistics of the U.S Treasury Department (Oh Yun ah, November, 2012).

It is necessary to have a solution for the strategic improvement plan and review on the extension of exchange as Myanmar is expected to become a promising market and investment zone due to the countries lessening economic sanctions in international community. A more integrated economic relationship between Korea and Myanmar can be beneficial as Korea's successful experience with industrialization and Myanmar's plentiful natural resources and development potential are complementary.

1) For October 2011, current population is total of 60.38 million and size of the land area is 680,000km² which is about 6 times bigger than that of Korea (100,000km²)

Korea is interested in Myanmar's energy resources, and strengthening cooperation between the two countries. Myanmar also wants greater Korean investment. I would like to give an analysis on possible options by studying the investment environment of Myanmar in order to determine which structures will be able to help dominate market as Korea's good image through Korean Wave is being maintained.

II. Economic indicator of Myanmar and Amendment of Foreign Investment Law

1. Economic Indicator of Myanmar and its Foreign Exchange Rate

1) Economic Indicator of Myanmar

Myanmar has had constant economic progress, and its growth rate will continue to increase as liberalization is accelerated. According to the IMF, Myanmar's expected GDP growth rate for 2014 is 7.75%, and a rapid constant growth rate (2012/13 7.3%, 2013/14 7.5%, 2014/15 7.75%) was expected after 2012. Expanding investments in the energy and communication sectors, a boom in the construction and service sectors, increased exports in basic raw materials, an influx of tourists and an increase in foreign investments are considered to be major engines for growth. An inflation rate of 6.9% is expected to be a side effect of rapid growth. Side effects also include an increase in wages for public sector, increase in electricity charges, and a rise in property price, rental fee and consumer price. This can also be attributed to an increase in the trade deficit and the limited management capability of government. Safeguards are needed because of the rapid inflow of foreign exchange (revenue from permission of mobile communication, FDI, loan and increased inflow of foreign exchange), increased trade deficit due to increased imports, as well as low foreign exchange reserves and increasing exchange rate instability due to the lack of foreign exchange management capability of the central bank.

Table 1. Key Economic Indicators in Myanmar

	Economic Indicators	Unit	2010	2011	2012	2013	2014(Ex pected)
Domestic Economy	GDP	One Hundred Million US	454	519	544	-	-

		Dollars					
	Per Capita GDP	Dollars	742	832	876	869	910
	Economic Growth	%	5.3	5.5	7.3	7.5	7.8
	Industrial Production Growth Rate	%	4.3	5.8	8.6	-	-
	Gross Domestic Investment/GDP	%	15.4	13.1	18.4	-	-
	Unemployment	%	4.0	4.0	4.2	4.02	4.02
	Financial Balance/GDP	%	-4.5	-4.2	-3.4	-	-
	Consumer Price Index	%	8.2	4.2	5.8	5.8	6.6
Foreign trade	Rates (US Dollars, Year-Round)	Kt	970	815	853	930	997
	Current account	Million USD	-392	-1,366	-2,325	-	-
	Current Account/GDP	%	-0.9	-2.6	-4.3	-	-
	Goods Balance	Million USD	3,455	2,224	1,552	-	-
	Goods Balance/GDP	%	7.6	4.3	2.9	-	-
	Export	Million USD	7,831	8,206	8,611	-	-
	Import	Million USD	4,376	5,982	7,059	-	-
	Service Balance	Million USD	-430	-399	-411	-	-
	Import(Credit)	Million USD	367	-	-	-	-
	Pay(Debit)	Million USD	979	-	-	-	-
	Capital Balance	Million USD	1,129	-	-	-	-
	FDI Net inflow	Million USD	910	-	-	-	-
	Foreign Reserves	Million USD	3,763	3,931	4,107	-	-
Loan Interest Rate	%	17	16.3	13.0	13.0	13.0	
Central Bank Interest Rates	%	12.0	12.0	10.0	10.0	10.0	
D e b t Status	Total Debt Balance	Million USD	6352	5956	5379	-	-
	Short-term Debt	Million USD	881	851	-	-	-
	Total Debt Balance/GDP	%	18.3	13.2	10.8	-	-
	Debt Payments/Total Exports	%	8.4	3.8	5.1	-	-

Source: Korea Export-Import Bank, IMF, Myanmar Central Statistical Office

Myanmar also suffered from supply shortages under the economic sanctions of the United States. Because of this, the government over-issued the currency, which also contributed to the high inflation rate. The smuggling of drugs is a serious problem and government consent, along with corporate monopolization, is serious corruption.

However, trade and FDI are increasing. As Foreign Direct Investment (FDI) on electricity (41.7%) and petroleum gas (31.1%) make up around 72% of total FDI, investments in the manufacturing industry (8.6%), hotel tourism (3.9%), estate property (3.2%) are rapidly increasing as economic sanctions were lifted after the change of government in 2011. Approval of foreign investment until April 2012 has reached to 707 cases, which amount to around 46.4 billion and 85 million dollar. Meanwhile for the locals, the manufacturing (27.7%) and construction (16.3%) sectors are leading total

investments, and hotel tourism (13.4%), transportation (8.9%), electricity (10.1%), industrial estate (6.7%) and estate property (3.31%) have significant values as well. Investment in construction and infrastructure is generally the biggest among all the sectors.

Currently, Myanmar's trade balance maintains a surplus thanks to the successful exports of natural resources (i.e. natural gas), and strong import restrictions despite economic sanctions from West. However, Myanmar's export reached 11.2 billion dollars, which was an increase of 24.8% compared to same period last year. It was also after the new government took office in 2011 that imports reached 13.7 billion dollars, an increase of 51.7%, because of import alleviation. The trade balance figures were around -25 billion to 55 billion dollars, which lead to a greater deficit compared to the 2013-2014 fiscal year. Myanmar's main exports are natural gas, beans, clothing, seafood, teak, and hardwood, among others. Its imported goods are ethereal oil, machinery and transportation equipment, metal goods, electric appliances and accessories, plastic, among others. Export income from natural gas is 3.3 billion dollars, which is 29.4% of total, export income, and exports from natural gas, beans, teak and hardwood occupy around half of the total export. Export income from clothing rapidly increased 27.3% to 0.885 billion dollars, which is 7.9% of total export income, due to an increase of investments in the sewing industry caused by the Generalized Scheme of Preferences (GSP), approval of new investments, and an inexpensive abundant labor force. The importation of automobiles increased due to the fact that the government opened the market for secondhand vehicles. The importation of metals and metal goods also increased.

2) Implementation of managed floating exchange rate system and establishment of stock market.

Myanmar abolished the problematic fixed exchange rate system and imposed a managed floating exchange rate system beginning April 1, 2012 (Jeong Jae Wan/ Park Na Ri, April 2012). Changes in the exchange rate system were part of the new government's reformation and modernization for the economic system, as well as the alleviation of international capital transaction and overseeing the remittance restriction after unifying the complex fixed exchange rate system that had existed for 35 years. Myanmar's finance and exchange rate reformation will be accelerated by the imposed managed floating exchange rate system, and foreign investment system will also improve. The Central Bank of Myanmar sets an average excluding maximum and minimum values among the suggested exchange rates in the auction market, supply and demand in the foreign exchange market. It also sets the exchange rate after considering foreign exchange reserves and international prices, as well as finalizes and notifies the reference rate of the Kyat through process of application of $\pm 0.8\%$ band.

The dollar exchange rate was 818 (basic exchange rate) MMK on April 2, 2012 when the managed floating exchange rate system was first imposed, and it was 857.9 MMK last February 21, 2013.²⁾

Meanwhile, Myanmar legislated the Securities and Exchange Act which provided the basis for the establishment of the stock market, along with the imposition of the managed floating exchange rate system to promote reformation/opening policies after the inauguration of the new government. Myanmar is planning to establish its first stock market in 2015 to support this. The state-owned Myanmar Economic Bank is in charge of the Yangon stock market management, and the Japan Tokyo Stock Exchange and Daiwa Securities Group will help the Myanmar Economic Bank and sign a contract for joint venture. Six highly profitable private enterprises are recommended, however there will be only few listed companies when the stock market opens.

2. The lifting of Myanmar's economic sanctions

Myanmar was included in world's poorest countries after 1989. After the United States lifted its economic sanctions against Myanmar, the country prepared for democratization in order to resolve its economic problems. The present Thein Sein government was established in March 30, 2011 after the November 2012 election (Korean Trade Association, November, 2012).

Myanmar shifted to an open-door policy to make an effort for self-rehabilitation, and this shift resulted in opportunities, like foreign direct investment inflow, for economic growth (You Jae Won et al. December, 2010). The Myanmar government amended the unnecessary regulations in Foreign Investment Promotion Act for economic development vitalization, and the National Assembly approved the amendments in November 2011 (Kang Seon Gu, January 2013). Myanmar also approves foreign investors through the One Stop service, and it is practicing reformation actions such as the release of political prisoners, and developing peace treaties with minority rebels.

Countries are currently in the process of lifting economic sanctions against Myanmar, beginning with Australia in 2012. Major countries will begin to actively invest in the country, mostly because of the recovered diplomatic relations between Myanmar and the US after 22 years. The renewal of diplomatic ties is seen as a response to Myanmar's reformation actions. The US State Department also lifted the Trafficking Victims Protection Act, which prohibited the giving of financial support to Myanmar. The US also shifted its Specially Designated Nationals policy on Myanmar from comprehensive sanctions to selective sanctions (Oh Yun ah, November, 2012).

2) <http://usd.fxexchangerate.com/mmk/>

Financials transactions, investments, and trade made with Myanmar were allowed after the US lifted sanctions. However, transactions with organizations or individuals listed under the Specially Designated Nationals list are still prohibited.³⁾

The Office of Foreign Assets Control said that economic transactions with Myanmar and new investment permission policies were main issues regarding the lifting of economic sanctions. This was the same office that announced the policies regarding the lifting of economic sanctions against Myanmar in July 11, 2012(Jung Yu Jin, 2012.7).⁴⁾

Table 2. Lifting of economic sanctions in different fields and its current state

Fields	Contents	Relevant laws and regulations		Starting Year	Lifting of Sanctions (Present. November, 2012)
		Law	Executive Order		
Economic Transaction Prohibition	Prohibition on every economic transactions with U.S or American citizen	JADE Act	Executive Order 13047 and two other orders	1997	(Lifted in July 2012)
Investment Prohibition	Prohibition on new investments in Myanmar	1997 Government Procurement Act	Executive Order 13047	1997	(Lifted in July 2012)
Visa Prohibition	Prohibition on issuance of Visa and entrance for Myanmar government, military leaders, supporters and their family	JADE Act and other two acts	Executive Order 6925 and one other order	1996	(Partly lifted in September 2012)
Freezing of Assets	Freezing of assets of Myanmar government and government	JADE Act and one other act	Executive Order 13310 and three other orders	1997	(Partially lifted in September 2012)

3) <http://www.treasury.gov/resource-center/sanctions/Programs/pages/burma.aspx>

4) OFAC is an organization in charge of economic and trade sanctions towards particular countries, regimes and terrorists going against United States' diplomatic policy and security policy direction.

	personnel				
Aid Prohibition	Prohibition on supporting Myanmar through bilateral aid and international organization	Foreign Assistance Act and other six acts	-	1995	(Lifted in October 2012)
Prohibition on Import of products from Myanmar	Prohibition on imports of products from Myanmar (expanded to every product from 2003)	Burmese Freedom and Democracy Act and one other act	Executive Order 13310	1990	(Lifted in November 2012)
Prohibition on Applying Generalized Scheme of Preferences	Suspension of applying GSP through presidential proclamation based on 1974 Trade Reform Act	-	Executive Order 5955	1989	Continues
Prohibition on Arms Export	Prohibition on export of every war supplies and services to Myanmar	Arms Export Control Act	-	1993	Continues

Source: Oh Yun Ah (November 2012)

3. Myanmar Foreign Investment Promotion Act Amendment

The Foreign Investment Promotion Act (SLORC Act No. 88/10), which was legislated in November 30, 1988, changed Myanmar's market economy system. In 1990, the Law of Establishment of the Socialist Economic System from 1965 was withdrawn and the Private Industrial Enterprise Law, SLORC Act No. 90/22 was legislated. The Foreign Investment Promotion Act, which was amended in November 2012, included government insurance for foreign investors, guaranteed fruitage remittance, guaranteed return of investment after the end of contract. Essentially, it endeavored to dispel worries of investments from foreign companies.

Table 3. Foreign Investment (in millions of dollars)

Country name	2010.3.31.	2011.3.31.	2011.4.31.	2011.12.31.	2012.7.31
China	1,849	9,603	9,603	13,947	14064
Thailand	7,422	9,568	9,568	9,568	9568
Hong Kong	510	6,308	6,308	6,308	6371
Korea	239	2,915	2,930	2,939	2959
England	1,861	2,659	2,660	2,661	2246
Singapore	1,592	1,809	1,809	1,804	1515

Source: KOTRA & globalwindow.org 및 CSO, Selected Monthly Economic Indicators.

The Foreign Investment Promotion Act Amendment was passed in a joint session last November 2, 2012 and was finally approved with the president's signature. This was done because of the government's eagerness to open the market and attract foreign investment. In response, the US and the EU lifted their economic sanctions (Sein Shwe Tun, November 2012). In July 2012, foreign investment in Myanmar was worth 41 billion dollars, with China investing 14 billion. Thailand, Hong Kong, and Korea also made significant investments.

Ambiguous language and standards about restrictions for foreign investments, as well as the protection of small companies, were clarified by clearer language and added regulations. Language regarding restrictions for foreign investments such as 'livestock industry which does not cooperate with government and public enterprise' was unclear in scope, and it was revised to read 'livestock industry which only local residents can carry out under the regulations and guidelines' to reflect clearer legal interpretations.

Table 4. Comparison between the original Foreign Investment Promotion Act (1988) and newly amended Foreign Investment Promotion Act (November 2012)

Contents	Original Foreign Investment Promotion Law	New Foreign Investment Promotion Law Amendment (March November 3, 2012)
Land lease	Basically 30 years, can be extended to 5 or 10 years	Basically 50 years, could be extended to 10 and 10 more years (Could be extended continuously according to scale of investment)
Possible portion for land lease	Owned properties and buildings of government/public enterprise	Owned properties and buildings of government/public enterprise, civilian's land properties and buildings can be leased.
Land rent fee		Proceed after consultation on rent fee from both sides (Decide rent fee within 365 days as a standard)

Foreign Exchange Remittance and Exchange		<ul style="list-style-type: none"> - Investors are allowed to have dollar accounts from banks which can remit foreign currency in Myanmar - Investors have to inform the Myanmar Investment Commission (MIC) for inflow schedule of foreign currency needed to be brought to the country for invested business - Investors have to remit to the MIC the bank name, address, account number, and signature of the person who can receive money with the copy of the bankbook in 1 week after opening the foreign currency account. Investors can transfer the account to a domestic partner or local business related to their investment or if they have to pay in foreign currency by their account. - Foreign currency received by Account Transfer is set equal to Earning Money for export - Investors have to report amount of foreign currency for investment expansion to the MIC. Investors have to be inspected for each business by legitimate audit office in a year, and should report the result to MIC in 30 days. - Investors can remit abroad the business profit, collectable money with approval from MIC, and grant for encouragement.
Reference		Investor needs to inform within 6 months before withdrawal by damage from business

Source: Sein Shwe Tun (2012.11).

III. Expansion direction of Myanmar and Investment Environment issues

1. Expansion direction of major countries towards Myanmar

Myanmar’s foreign investment will increase due to the expansion on the open-policy of its economy. Multinational companies that are expanding are expected to consider Myanmar’s geopolitical and geo-economic characteristics. Myanmar’s geographic location between China and India is a strategic point that connects the east and the west. The country is also blessed with plentiful natural resources a great development potential (Go Seok Min December 2012). The expansion of multinational corporations into Myanmar is expected as the US begins to invest in and transact with Myanmar by lifting import restrictions.

Many countries recognized the strategic significance of Myanmar—China, the US, and Japan, among others, are rapidly expanding. The US is strengthening its influence by lifting economic sanctions and is reinforcing the relatively slower expansion of American multinational companies. Thailand’s Deway Deep-sea Port Project will be back

on track because of initiatives from the government, though its original developer, the Italian-Thai Development Company, is struggling due to the financial crisis.

China is shifting from its hard strategy to a soft one, as the country is aware of the increasing support from the west and the swelling anti-Chinese sentiment in Myanmar. China is supporting the development of the railway system, roads, and industrial complexes, as well as cooperating with the Kyauk Phyu natural gas project. China is also using the common socialist background as a means to strengthen economic cooperation, even when Myanmar was under economic sanctions of the US. China's investment in Myanmar has reached up to 14 billion, and combined with Hong Kong will amount to half of the total current foreign investment in Myanmar. National investment projects such as the construction of an oil and natural gas pipeline was completed in 2013. A high-speed railway between Muse and Kyauk Phyu worth 20 billion dollar also began in early 2012 (Korea International Trade Association, 2012.11).

Japan is investing in infrastructure, electricity, and natural resources development, Yangon development, among others. It is also supporting the economic development of Thilawar, a maintenance project for the Ywama complex chemical power plan. The country is also determined to strengthen its relations with Myanmar after freezing economic aid and investment through cancelling a loan worth 300 billion Yen. It also allowed to loan to Myanmar during the Tokyo summit conference last April 2012, and it is also encouraging Japanese companies to invest in Myanmar.

On the other hand, rental fees of land and other real estate properties began to increase in 2011, and they have since become the greatest obstacle for companies to invest in Myanmar. Rental fees increased due to the expectation of an increase in foreign investment. This is because government once sold public property to private individuals before moving its capital to Naypyidaw. This increased in rental fees, however, is expected to decline if economic development projects for Thilawar, along with large-scaled industrial complexes, are completed despite the lack of government oversight. The biased view against foreigners is also seen as a disadvantage. Foreigners and foreign companies in Myanmar are charged with 5~70 times higher for electricity, communication, water, and other facilities (i.e. domestic airport, golf course) by collecting their dollars. Policies that are not in favor of foreigners are also being implemented; since 2012, Myanmar has prohibited the new registration and renewal of foreign corporate bodies, arguing that it could promote the illegal exportation of foreign currency.

The Investment Promotion and Protection Agreement between Korea and Myanmar has not yet been signed, as the process and the documents for remittance is extremely complex. Koreans are not treated equally. It is expected that the Investment Promotion and Protection Agreement will be signed in the near future, as governments have agreed to conclude the Korea-Myanmar grant aid basic agreement

and Investment Promotion and Protection Agreement when Pres. Thein Sein will be visiting Korea in October 9, 2012 for the expansion of investment opportunities of both countries. However, Myanmar's advantage is that its economy has a lot of potential.

2. Myanmar's Industry Environment

Myanmar is actively supporting the lifting of trade policies, the reinforcement of foreign investment, the new government's policies, economic reformation to generate economic growth, and the expansion of infrastructure construction. The government also encourages other reformation actions, such as the opening of a stock market with the cooperation of the World Bank and the international community. Foreign direct investment will increase due to the Foreign Investment Promotion Act Amendment, as well as the privatization of government-owned companies. The government of Myanmar is also initiating a five-year plan for national economic development, as well as reduces the number of the destitute poor from 26% to 16% through the agricultural development plan. The government also plans to seek for job-creating businesses, develop the secondary/tertiary industries, as well as expand policies for foreign investment. The agricultural sector's GDP dropped from 36.4% to 29.2%. For the industrial sector, its GDP increased from 26% to 32.1%, and the service industry is expecting an increase of 1.1% from 37.6% to 38.7% (Go Seok Min, December 2012).

Table 5. Myanmar GDP by Industry

	2001	2003	2006	2011
Agriculture	57.1	50.6	43.5	43
Industry	10.6	14.3	19.4	20.5
Service	32.4	35.1	37.1	36.6

Source: ADB.

Myanmar's industrial structure is that of a typical agricultural nation in which agriculture makes up 43% of the industry. However, industrialization has created a shift to secondary and tertiary industries. Secondary and tertiary industries include labor-intensive industries, like the sewing industry, as well as simple business like tourism.

There is much demand in Myanmar because of its developing country status. The country also has untapped natural and mineral resources and a potential to expand because of its strong 60 million population. It has the potential to become a key economic point for 3 billion people in the region, as Myanmar can provide

inexpensive and quality labor force at the right time (Jang Jun Young 2010).

For the agricultural sector, production is expected to increase from 16% due to improvements in facilities and production, and more land cultivation that is currently at 9.3%. Myanmar has great forest resources since it comprises 75% of the teak market. It is, however, prohibited to export forest resources, but the current foreign investment expansion into Myanmar might change that policy. For now, only some Chinese companies are allowed by the government to log in Myanmar.

Myanmar also has a variety of energy and mineral resources due to its complex geological structure. The country's main minerals are copper, nickel, iron ore, tungsten and antimony. Myanmar is also known for jewelries like jade, ruby, and sapphire. Gold deposits are at 5.6 million tons, and the government supports the gold mining industry to secure more financial resources.

Myanmar also has economic advantages in the energy sector, such as petroleum and natural oils (Jang Jun Young 2010). It is one of the oldest oil-producing countries in the world, which started the development of crude oil in 1853. Natural oil was Myanmar's greatest FDI product for 20 years, and currently remains to be worthy of additional research and drilling.

However, the Social Overhead Capital (SOC) is currently underdeveloped and poor due to the stagnation of Myanmar's industries (Jang Jun Young 2010). Goods needed for development are not easily affordable, and there are still energy security issues despite the good amount of mineral deposits. Furthermore, there are still additional costs despite the investment of multinational companies.

3. The challenge of Myanmar's investment environment

Myanmar currently has communication with China and India, two large-scale countries in the consumption market. This can be used as a production base that targets both China and India, and also has the potential to connect other regions in the east, west, and South America. The establishment of the roads and port that connects Myanmar to mainland China and the Indian Ocean, as well as the construction of the China-Myanmar-India and Thailand-Myanmar-India road networks will increase the value of Myanmar's geographic local and truly make the country a strategic area with major connections to highly populated areas.

The lifting of economic sanctions of major countries will affect the number of investments coming from said countries, as well as alter the investment environment for our company. The US remains to selectively regulate Myanmar through the SDN despite the fact that the US has already lifted most of its economic sanctions against Myanmar. It will be prudent to make investment and policy decisions based on this. The return of said economic sanctions is possible, as the lifting of sanctions was not

an actual amendment but was merely an administrative proclamation through a suspension.

There are several factors that would turn investment away from Myanmar. Since the country is currently in the process of economic reformation and democratization, there are still suspicions of military influence in the government despite the fact that a civilian government has already been put into power. There is still no detailed action plan for economic reformation, although there are changes brought in by the Foreign Investment Promotion Act. There should be an in-depth monitoring of mechanism to see the changes in the market environment in order to gauge the appropriate response for the rapidly changing systems of Myanmar's market environment.

Lagging road, electricity, and water infrastructures are obstacles of investment. Only half of the roads are paved, and only one-fifths are paved in the rural areas. Three-fourths of the population lives without electricity due to power shortages. The swelling of real estate property is worsening, which badly affects the investment environment. An underdeveloped foreign currency and financial market limit foreign investments, and domestic financing is hard to come since the financial market in Myanmar has not been developed.

Table 6. SWOT of Myanmar Investment Environment

Strengths	Opportunities
<ul style="list-style-type: none"> o Open-policy of government and expansion of policies for economic growth o Abundant demand for development and investment as an underdeveloped country o Abundant domestic market and natural resources o Low wage and abundant labor force o High development potential and is a strategic point situated between India and China 	<ul style="list-style-type: none"> o Government reformation and support of open-policy, large-scale development and privatization o Lifting of economic sanctions in international society and expansion of support o Opportunity to preoccupy underdeveloped country's market and a bridgehead to huge markets of China and India o Friendly relations towards Korea for demand for economic experience of Korea and Korean Wave o Expansion of business opportunities due to demand for development within ASEAN
Weaknesses	Risks
<ul style="list-style-type: none"> o Lacking investments in the legal system and transparency o Lacking social overhead capital and financial infrastructure o Lacking experience of market economy o Corruption and lacking skilled labor 	<ul style="list-style-type: none"> o Existing political/economic/social fear factors o Change in investment environment due to economic sanction of major countries o Offer of remittance and lacking

<p>force</p> <ul style="list-style-type: none">o Control in foreign exchange due to lacking foreign currency	<p>financial environment</p> <ul style="list-style-type: none">o Increased power of influence of China and Indiao Preoccupation of multinational companies and major competing countries
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A plentiful inexpensive labor force exists, but they are unskilled. The income of Myanmar's labor force can compete with those of its neighboring countries, however they remain to be unskilled. There can be competition due to the expansion of multinational companies, as well as the increasing influence of China and India. However, a potential domination of the market will not be possible because of its status as a potential market.

As a country with rich resources, Myanmar is expected to continue receiving international attention as the "land of opportunity" as it comes out with large-scale development projects. Various industrial infrastructure projects, such as resource development and securing the Social Overhead Capital, have been scheduled. This is a good opportunity to expand the investment portfolio, as well as advance other opportunities. A review is also needed before further expansion is done, especially since the US and other major countries have opened economic transactions with Myanmar, therefore increasing expectations of an acceleration of the market.

It is possible for Myanmar to reduce shipping fees as well as the waiting time to receive natural resources. It can also solve energy problems. Better relations with Korea due to the Korean Wave can work as a unique advantage for expansion, as both cultures have similar traits such as respect for elders and high national dignity. Myanmar looks highly at Korea's experience of achieving economic development in such a short period of time. In this light, Myanmar sees Korea as a development model and that can be seen as an advantage.

IV. Conclusion

Myanmar has a various number of elements for rapid growth: plentiful natural resources, fertile lands, an inexpensive and young labor force, and a strategic geopolitical location. However, institutional support for public investment and public expenditure expansions for infrastructure, health and education is still wanting at this growth rate.

Myanmar's international status improved when it hosted the South East Asian Games in 2013. It will also be the ASEAN chair in 2014. The ADB dubbed Myanmar as

“Asia’s Rising Star” with its Myanmar economic report in August 2012. The country is expected to reach 2000 to 3000 dollars per capita income until 2030.

Myanmar is expected to continue working as a producer and as a domestic market. It has strong elements as a domestic market (a population of 60 million, easier advancement opportunities, high economic growth) and as a producer. It has a great development potential.

Myanmar is known for historical Buddhist sites and its beautiful beaches. The country should also utilize these resources by investing in tourism and developing new programs.

Japan, China, and Thailand have discussed providing the government of Myanmar with support to increase its international competitiveness by urging their companies to expand in Myanmar. Japan is in the process of obtaining a large-scale public-private project. Japan’s activities should be observed as a better and more detailed strategy for cooperation still has not yet been developed fully in Korea.

There is a need to customize the expansion strategy after recognizing the potential of Myanmar. The following are suggestions:

First, it is more advantageous to approach credit assistance with likeability and awareness. Expansion solutions will be sought through credit assistance, as well as connecting with Korea’s superior infrastructure construction industry. The expansion of Korean companies in Myanmar will likely need better opportunities, such as compensation for credit assistance rather than energy resource induction.

Second, Korea should share its development experience as well as its development systems. This is needed in human resource education. An economic forum between Korea and Myanmar is a meaningful effort, and it requires expanded participation of experts and professionals. Korea’s sharing of its social and economic system will contribute greatly to the expansion of Myanmar’s economy.

Third, there should be a phased expansion strategy that can minimize the local investment risk. Investments in small businesses and the expansion of public companies are necessary, but require a significant amount of resources. The expansion strategy should also including choosing wise investments in sectors such as the green sector, manufacturing sector, the energy sector, as well as the communication industry. Thailand can be used as a great trade volume detour to Myanmar thanks to the Korea-ASEAN FTA. This could take a look at possible expansion strategies that can help acquire benefits from tariff and overcome cultural differences.

Fourth, there is a need for short-term expansion in labor-intensive field. These labor-intensive manufacturing industries utilize a low-wage labor force (i.e. clothing, sewing, wig, electronic products, and a raw material procurement type of business such as fishing and simple processing of marine products).

Fifth, there is a need for the establishment of an export or local factory for Korean

industrial products that will capture the Myanmar domestic market in the medium to long term. An increase in the number of upper middle class is expected, so the demand for high-quality goods is also expected. Korean second-hand vehicles will be center of market in the early stages, and local production will also be necessary in the medium to long term.

Sixth, there is a need for the development of long-term natural resources. Resources needed for the development of crude oil, natural gas, mining, hydroelectric power and other sources of energy are ideal in the long-term. This must be done simultaneously with the construction of various infrastructures. Infrastructure construction should proceed in the form of credit/grant assistance, thus there is a need to negotiate on a strategy to create the proper resource development rights as incentives.

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Factors Affecting Physicians' Satisfaction with the Clinical Laboratory Services of Private Laboratories in Mandalay

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Abstract: Physicians are primary customers of laboratory services and their perception of the provided services is considered an important measure of quality assurance. This study investigates the factors affecting the physicians' satisfaction with clinical laboratory services of 5-7 big and medium-sized private laboratories in Mandalay, to find out the problems causing dissatisfaction in different factors and identify the areas need to improve in laboratory process. The study measured satisfaction of laboratories' primary customer (physicians) of provided services in different aspects including the quality and reliability of the result, the efficiency of laboratory personnel, laboratory management responsiveness, phlebotomy service, turnaround time TAT and laboratory information system. Physician satisfaction paper-based survey of 5-Likert Scale, (1=very satisfied, 2=satisfied, 3=neither satisfied nor dissatisfied, 4= dissatisfied, and 5= very dissatisfied) was developed based on the CAP survey (College of American Pathologists) and related published studies. One hundred and five physicians complete the survey. The result shows that, there are significant correlations between physicians' satisfaction with the other four independent variables (service attitude of laboratory personnel, phlebotomy service, quality and reliability of results, and efficiency of laboratory personnel). More than half of the respondents were satisfied with overall laboratory services (N=62 (59.05%). Physicians were most satisfied with lab information system (easy & clear report and reference range reported). However, physicians were most dissatisfied with the test turnaround times (TAT) for urgent, and routine tests. Statistically significant association was mostly observed between physician satisfaction and service length. This study presented areas need to improve of laboratory services at the private laboratories in Mandalay, which mainly related to administration, communication, quality and delay in TAT. The efficiency and optimization of laboratory service need to be readdressed by the laboratory administration. Effective extra laboratory communication channels needed to be established to improve interaction between laboratory and physicians.

Keywords : Physician satisfaction, Laboratory services, TAT, Laboratory management, Results accuracy

I. Introduction

Clinical laboratories are essential component and one of the most important departments at any healthcare services where medical tests and investigations done in order to generate reliable and accurate information regarding patient's health (Hassemer DJ, 2003). Laboratory reports usually are the bases of medical decisions and possible management plans that considered by physicians. Therefore, laboratory results must be of the highest quality and reliability to insure that the course of action taken by physicians will almost lead to the best possible outcome for the patient (Hassemer DJ, 2003), (Teklemariam Z, Mekonnen A, Kedir H, Kabew G, 2013).

Customers' satisfactions of the provided services, such as in the healthcare institutes, are considered one of the essential key performance indicator of quality. (Kairys J, Zebiene E, Sapoka V, Zokas I, 2008), (Adulkader NM, Triana BE, 2013).The World Health Organization (WHO) indicates that evaluations of client satisfaction might address various aspects of the provided services: reliability and consistence of the services, the responsiveness of services, and the willingness of providers to meet client's expectations and needs. (Workbook 6,WHO,2000).Thus, the efficiency of laboratories could be measured from different perspective. Physicians are the primary customers of laboratory services and their satisfaction of provided services is an important quality measure in most quality assurances frameworks.(Adulkader NM, Triana BE, 2013), (Bruce JA, Bekeris LG, Raouf E. Nakhleh, Walsh MK, et al. ,2009).According to the American Pathologist (CAP) and the Joint Commission on Accreditation for Healthcare Organization's laboratory checklist, physicians are considered the primary customer of laboratories' services and measuring their satisfaction is an essential concept. (Bruce JA, Bekeris LG, Raouf E. Nakhleh, Walsh MK, et al. ,2009).In addition, physicians are the primary external customers of laboratory services and their opinions are essential components in providing laboratory managers with opportunities to identify areas for improvement. (Jones BA et al.;2009).Nowadays, assessing customer satisfaction with laboratory services is considered an important component of a laboratory quality assurance programme, and is required for accreditation by the College of American Pathologists and the Joint Commission on Accreditations for Healthcare Organizations. Both agencies are located in the United States of America and have power for accrediting laboratories. (Jones BA et al.;2009).Many aspects of the laboratory services could be investigated from the perspective of physicians including, courtesy of clinical laboratory staff, laboratory manager responsiveness, phlebotomy service, laboratory test turnaround time (routine and urgent turnaround times), full range of laboratory test services requested tests are available and quality and reliability of results (congruence between the clinical laboratory results and signs, symptoms and response to treatment),laboratory

information system (easier & clear clinical report format and reference range reported) and overall services of laboratory. In addition, one of the most obvious indications of laboratory service, which often used as a crucial performance indicator of laboratory performance, is turnaround time (TAT). (Hawkins RC, 2007). TAT is the time to return a test result. Assessment of TAT allows laboratory directors to understand whether local performance is adequate or need to be improved, and how it is compared with published norms. Delays in reporting laboratory results can lead to delay in the management, diagnosis, treatment and release of patients. (Elhoseeny TA, Mohammad EK, 2013),(Steindel SJ, Howanitz PJ, 2001).This study aimed to investigate physicians' satisfaction of hospital clinical laboratories' services. The study might be indicators of possible limitations and the bases of quality improvement, which would lead to efficient healthcare services.

1. Background of the study

In Myanmar, The country's healthcare industry is growing rapidly and is likely to cross the \$ 2 billion mark. This can be attributed to the increased focus of the government on this relatively neglected sector and also an increasing awareness among the locals to solicit better healthcare facilities than what they have been accustomed to, for decades. This rise in demand has led to private participation and new private hospitals and clinics mushrooming in big cities after the government opened its doors and initiated the liberalization process. International players have also appeared on the scene to set up diagnostic and testing laboratories. The healthcare industry involves players from the public sector which includes the Ministry of health, the private sector that runs hospitals and clinics, international NGOs, donor agencies and the military. Primary and specialist hospitals are located in the two main cities of Yangon and Mandalay which cater to the needs of the people from surrounding areas as well. Beyond these cities the facilities are quite basic and not equipped to handle emergencies and critical illnesses. Myanmar's 51 million have till recently, had access to basic treatments, having had to travel to Yangon and Mandalay for serious problems, resort to traditional medicine, seek advice of midwives in the absence of doctors, or if affordable, travel to neighboring Thailand, Singapore, Malaysia or India for treatment.

With governments spending 1-2.7% of GDP on healthcare, far below Vietnam's 6%, Indonesia's 3.1% and Malaysia's 4%. Per capita spending on healthcare is as low as \$ 35 which is less than half of the amount spent by Indonesia (\$ 107), Vietnam spending \$ 111 while Malaysia spends \$ 423. The current healthcare system is such that it entails out of pocket expenses with no external insurance agencies or even the government pitching in. out of pocket expenses 78% (down from 82-85% just five

years ago) of total medical spending on diagnostic, private clinic visits and also self-prescribed medicines. The small amount left is spent by the government and a few NGOs supporting primary healthcare in rural areas. Fifteen UN agencies operating in Myanmar support specific areas.

The present healthcare scenario even as improvements are witnessed and the two big cities are seeing new hospitals, some of the latest diagnostic equipment gets installed, more English speaking doctors join international clinics and emergency services become available 24x7, the ground reality about Myanmar's healthcare remains dismal. The World Health Organization has ranked Myanmar at 190th position out of a total of 191 countries in terms of 'overall health system performance'. This is because there is just one doctor for every 2,772 people, only one psychiatric hospital in the country, and there are vast expanses of rural terrains where no medical aid is available. Besides medical aid being extremely expensive, Myanmar has the highest individual out of pocket expenses, and also has the lowest level of government health expenditure.

The principal healthcare provider is the Ministry of Health that runs the 2,000 plus government hospitals with over 55,000 beds, as stated in (the Oxford Business Group's Myanmar Report 2016). Myanmar aspires to achieve Universal Health Coverage (UHC) as part of its Vision 2030 for a healthier and more productive population. In the implementation of National Health Policy, private sector plays a major role in Myanmar. They are regulated in conformity with the provisions of the law relating to Private Health Care Services.(August 2016, Myanmar insider). According to data by (source: Ministry of Health and Sports June 2016), the followings are registered health care services in private health care sector in Myanmar.

Table 1 Registered Private Health Care Services in Myanmar

Registered health care services	Quantity
Private Hospital	208
Specialist Clinics	524
Clinical diagnostic laboratories	182
Diagnostic Imaging (X ray)	135
Health care service provider	13
Labor room service	45

Private health care sector plays an important role in the current Myanmar Health care sector & role of clinical laboratory diagnostic services are increasing in Myanmar Health care. Concerning role of clinical laboratory services, it is estimated that approximately 80% of physician's diagnoses are a result of laboratory tests, and a fair number of these tests are sent to clinical lab service providers. In private sector, clinical laboratory service providers are of three types. They are Clinic-based laboratory, Hospital-based laboratory and Stand-alone laboratory. There are round about 6-7 big sized stand -alone laboratories in Mandalay. Some clinical laboratories attached with hospitals provide phlebotomy (blood collection) and analytical services 24 hours a day whereas stand-alone labs provide services 12 hours a day. Practically, blood specimens (samples) for both scheduled are taken by blood collectors (phlebotomists) who are well -trained nurse aids and tests are usually run & analyzed by medical laboratory technologists & the results are verified by consultant pathologists. Most of the laboratories have been providing a full range of laboratory tests whereas others provide clinical chemistry, hematology, microbiology etc.

Table 2. Registered Private Health Care Services in Mandalay

Health care services in Mandalay	Quantity
Government Hospital	11
Large-sized private hospital	8
Medium-sized private hospitals	12
Small specialist OPD(out-patient department) Clinic	28
Stand-alone laboratories	15



Figure 1 Map of Hospitals and Laboratories in Mandalay

2. Statement of problem

Most clinical laboratories in Mandalay are required to assess their customers' satisfaction in order to maintain their service quality. In daily practice, we have noticed that there are a numerous complaints about the quality of clinical laboratory services among physicians in Mandalay. However, no data have been published about these issues in private sector. This study may be the first study to investigate these matters. The findings of this study will be useful in designing and implementing measures to improve the quality of clinical laboratory services in Mandalay. Any resulting improvements could also be extended to other laboratories in Mandalay as well as in the country.

3. Objectives of the Study

- to assess physicians' satisfaction with the service provided by private laboratories (5-7 big & medium sized private laboratories in Mandalay.)
- to find out the problems causing dissatisfaction in different factors
- to identify the areas need to improve in laboratory process;

II. Literature Review

1. Customer Satisfaction

Measurement of customer satisfaction brings customer preferences into the quality

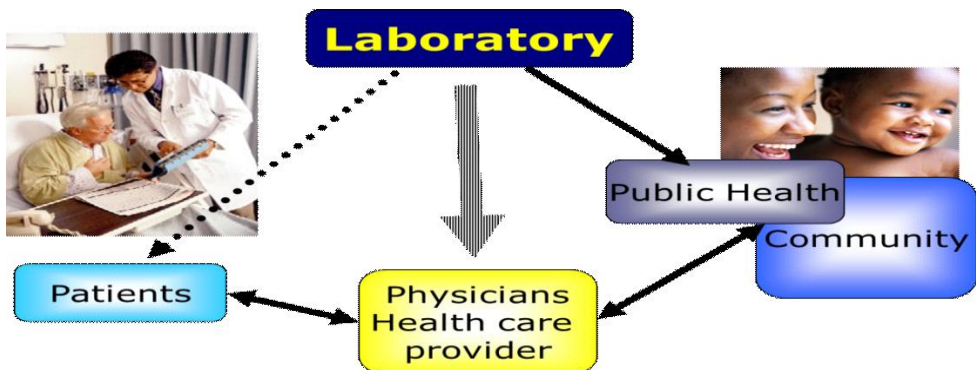
assessment process and corrects for mistaken assumptions about which particular aspects of service customers value most (Bruce JA, Bekeris LG, Raouf E, Nakhleh, Walsh MK, et al., 2009), (Oja PI, Kouri TT, Pakarinen AJ, 2006). Satisfaction is an important element of the quality of services, including health services: a high quality organization meets customer's needs. One approach assumes that, in the clinical laboratory, managers know what customers want and directly set out measures of laboratory performance in each specific area. Another approach considers that quality measurement is the assessment of customer satisfaction with the services provided by the laboratory. Each approach has its advantages for assessing quality. Direct assessment of local performance helps managers understand whether it is improving and how it compares to published norms. On the other hand, customer satisfaction assessment helps to better define the real expectations of the ordinary customers of a particular laboratory. (Mfinanga SG et al., 2008), (Workbook 6, WHO, 2000). Physicians are the primary external customers of laboratory services and their opinions are essential components in providing laboratory managers with opportunities to identify areas for improvement. (Jones BA et al., 2009)

Customer satisfaction is a major component of a quality management system, and a significant focus in the ISO standards. Ultimately, the laboratory produces a product – the test result – for its customers. If the customer is not well served, the laboratory is not achieving its primary function. Philip Crosby defined quality practice as meeting the requirements of the customer. He applied this practice to business and manufacturing, but it is equally important for a medical laboratory. The medical laboratory needs to know who its clients are and to understand clients' needs and requirements. It is the responsibility of the laboratory director to ensure that the customers' needs are met, and that there is customer satisfaction. The quality manager is responsible for measuring the degree of customer satisfaction, using surveys, indicators, and audits to take preventive and corrective action. All laboratory staff must understand the importance of customer satisfaction.

Laboratory personnel must always interact with customers in a way that is appropriate, providing needed information, and being courteous. Seeking customer satisfaction requires commitment from the laboratory management and staff. It is important to remember that technical competency is not the only goal for the laboratory. Meeting customer needs is a primary goal of the laboratory. Everyone in the laboratory is responsible for quality, and, therefore, for customer service. An active quality management system ensures laboratories meet all client requirements. A program for addressing customer satisfaction requires good planning, the development of appropriate monitoring tools, the knowledge to apply the tools to gain usable information. (Customer Service Module 13, WHO)

2. The laboratory and its clients

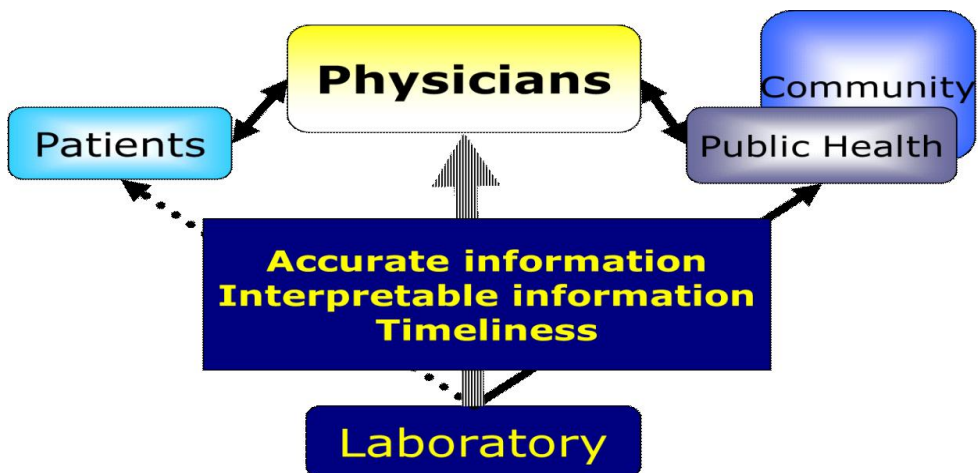
Medical laboratories have a range of customers including patients, physicians, public health agencies, and the community. The laboratory has many clients and the needs of all must be carefully addressed. A central figure in the client list is the physician or health care provider. The initial request for service originates with this person, and the laboratory staffs generally identify the ordering physician as the primary client. Remember that in a hospital setting, the health care provider will be assisted by many other people, including nurses, medical assistants, phlebotomists, and secretaries or clerks. These vital hospital personnel should also be considered clients of the laboratory, and their needs must be considered. Another important client for the laboratory is the patient, usually including his/her family. Family members may play a very important role in patient management, and may help with sample collection and transport. In many countries, laboratory tests can only be ordered by a licensed health care provider – a physician, or a nurse, or a dentist. In some countries, laboratory tests can be ordered by the patient directly without referral from a physician or nurse. Some patients do not have the knowledge or expertise to order the right test or to interpret results. Laboratory personnel may have to provide assistance in test selection and interpretation. In Myanmar, mostly physician order laboratory tests and refer patients to laboratory as well as some patients order laboratory tests directly without referral from a physician. (Customer Service Module13, WHO)



3 Physician/ health care provider requirements

The health care provider expects to have access to accurate clinically relevant information that can be understood and used in a timely manner. Health care professionals need assurance of laboratory responsibility throughout the testing

process, including pre examination steps, the testing process itself, and the post-examination process. In the re-examination phase, physicians will be particularly interested in the test menu. They benefit from an accurate collection manual, requisition forms that are complete but user-friendly, and a timely delivery system. For the testing or examination phase, physicians would like to be sure of working with competent personnel. They need to know that the test methods being used have been validated and that testing is done with good process control and with quality control procedures in place. Appropriate management of all adverse occurrences or errors will significantly affect physician laboratory use. The physician looks to the laboratory to do an excellent job in managing the post-examination steps, as these are critical to receiving the results of testing. A solid laboratory information system, a method for results verification and for delivering timely and interpretable results to the right place are all important.(Customer Service Module13,WHO)



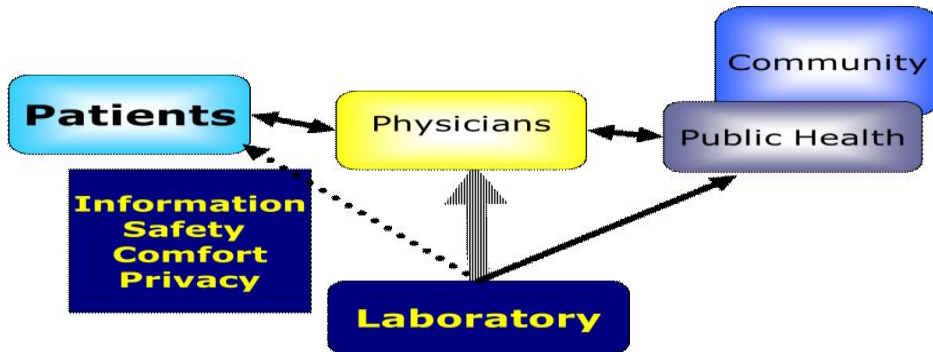
4. Patient requirements

The patient expects to receive personal care, keeping in mind comfort and privacy. He or she also expects to be assured that the testing has been done correctly and properly, and provided to the health care provider in a timely manner. The laboratory actions needed to meet the patient requirements include:

- providing adequate information, both for collection of a specimen, and also information about the laboratory;
- providing good collection facilities;
- having available trained and knowledgeable personnel; personnel should know how to collect a sample properly, and should be trained to be courteous to all

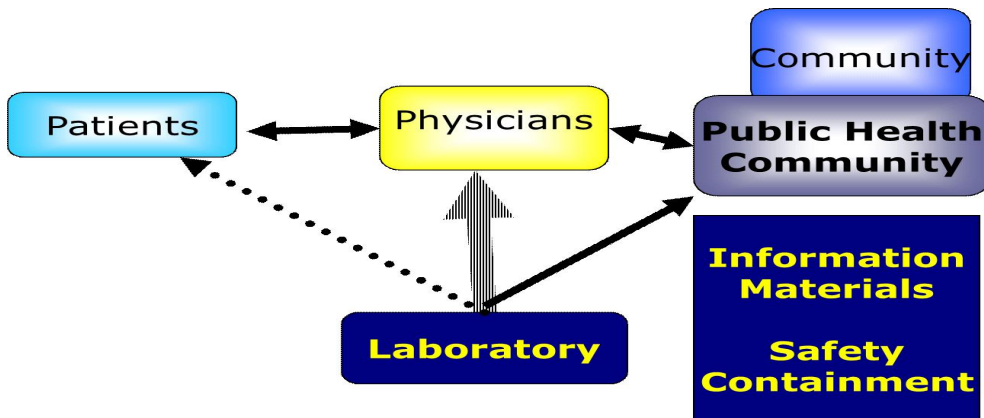
patients

- giving assurance that the laboratory records are maintained properly so that they can be easily retrieved, and also giving assurance of protection of the confidentiality of the records.



5. Public health requirements

Public health professionals have the same needs as health care providers, requiring that all parts of the pre-examination, examination, and post examination processes are carried out properly. They may need special kinds of information in dealing with an outbreak or epidemic, such as specific collection processes or forms designed for the particular project or investigation. Public health officials will also be particularly concerned with safety issues and containment of infectious material.



6. Community requirements

The community in which a laboratory does its work expects that dangerous materials will be kept within the confines of the facility, and that the laboratory will protect their own workers from risk. The laboratory is responsible for assuring safety and security, for containment of any infectious materials, for dealing appropriately with waste management, and for following all regulations for the transport of dangerous goods.

7. Serving all clients well

Customer service is an integral part of a quality management system. Good customer service provides:

- valuable information for best patient care;
- valuable information to improve surveillance and other public health actions;
- a professional image for the laboratory.

In order to understand whether client needs are being met, the laboratory will need to employ tools for gaining information. The laboratory needs to actively seek information from customers, rather than just waiting for customers to contact the laboratory with a complaint. The monitoring of customer service/satisfaction is part of the continual improvement performed by the laboratory. Important information on customer satisfaction may be obtained using: (Customer Service Module13,WHO)

- complaint monitoring
- quality indicators
- internal audit
- management review
- satisfaction surveys
- Interviews and focus groups.

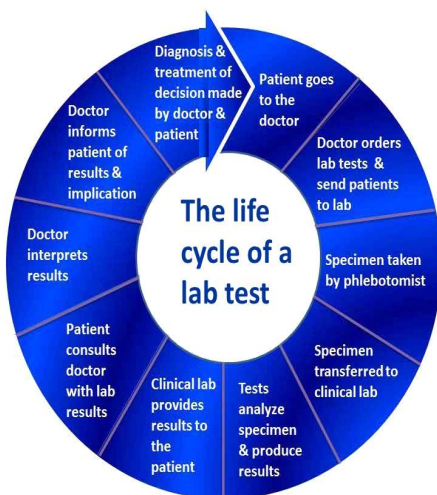
8. Laboratory Services

Clinical laboratory services are the most cost effective, least invasive source of the objective information used in clinical decision-making. Clinical laboratory services have a direct impact on many aspects of patient care including, but not limited to, length of stay, patient safety, resource utilization, and customer satisfaction. Clinical laboratory services provide the information required by a physician to start, adjust and also to stop a course of treatment. This allows for the most appropriate, cost effective use of expensive drugs and other therapies, and allows the patient to be treated at the most appropriate level of care for the most appropriate period of time. Without laboratory information, these decisions would be compromised at best. Clinical laboratory services

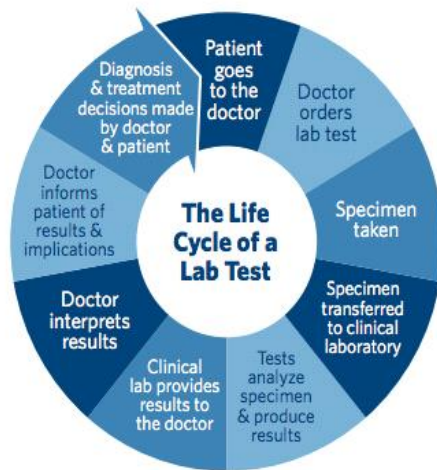
are a vital component of ensuring optimal outcomes for all patients accessing health care, whether for simple situations or for complicated, potentially life threatening situations; including end-of-life care. Laboratory professionals' impact patient safety by providing pre-surgical or pre-procedural testing that determines the current ability of the patient to undergo those treatments. Patient outcomes are influenced by providing the needed information for clinicians to monitor the effectiveness of ongoing treatments and therapies.(Value of Clinical Laboratory Services in Health Care,jul2005).

Clinical laboratory testing plays an essential part in the delivery of quality health care. A physician or other clinician orders lab tests to diagnose, treat, manage, or monitor a patient's condition. The process begins with the collection of a sample of blood, tissue, or other biological matter from the patient, which is then sent to the laboratory where it is uniquely identified and examined to make certain that it is appropriate for the testing ordered by the health care provider.

Some tests are manually evaluated, while most are performed using technically advanced instrumentation. Labs employ teams of licensed, highly skilled medical professionals specially trained to perform the requested analyses. Once the testing is complete, the lab issues a report with the findings to the ordering clinician. When the healthcare provider receives and interprets the lab results, informed decisions can be made as to most appropriate treatment for the patient.(importance-of-clinical-lab-testing-highlighted-during-medical-lab-professionals-week,Apr172014)



The life cycle of a Lab test in Myanmar Countries



The life cycle of a Lab in other Countries

Many aspects of the laboratory services could be investigated from the perspective

of physicians including, quality/reliability of test results, staff courtesy, accessibility of pathologist, accessibility of laboratory manager, phlebotomy services, test menu adequacy, accessibility of laboratory staff, courier services, routine test turnaround time (TAT), laboratory management responsiveness, inpatient stat test TAT, critical value notification, clinical report format, outpatient stat test TAT, and esoteric TAT. Various studies investigated the satisfaction of the primary healthcare providers (physicians) of laboratory services to identify possible limitations for future development. (Jones BA et al., 2009), (Oja PI, Kouri TT, Pakarinen AJ, 2006), (Tegbaru B, Meless H, Kassu A, Desalegn T, Gezahegn N, et al., 2004). For example, in 2002, Tegbaru and colleagues assessed 28 hospital and six regional laboratories in Ethiopia and reported number of problems mainly related to the limited infrastructure such as, lack of properly designed laboratory rooms, lack of water and electricity access, shortage of equipment and supplies, and absence of effective maintenance and spare parts. Also poor supervision and follow up were reported. Within the same study the lowest rate of satisfaction were found for critical value notification. On the other hand, another studies showed that the critical value notification, quality of laboratory results and staff courtesy were reported as the highest level of satisfaction, while the least satisfaction was seen in the TAT. (Miller KA, Dale JC ,1999), (Howanitz PJ,2002).

9. TAT (Turnaround time)

Laboratory analytical turnaround time is a reliable indicator of laboratory effectiveness. Clinicians consider TAT from the time the test is ordered to results reporting, whereas laboratory professionals usually use specimen receipt to reporting of results as the TAT. One of the most obvious indications of laboratory service, which often used as a crucial performance indicator of laboratory performance, is turnaround time (TAT) (Hawkins, 2007). TAT is the time to return a test result. (Hawkins RC, 2007), (Elhoseeny TA, Mohammad EK, 2013). Assessment of TAT allows laboratory directors to understand whether local performance is adequate or need to be improved, and how it is compared with published norms. Delays in reporting laboratory results can lead to delay in the management, diagnosis, treatment and release of patients. (Elhoseeny TA, Mohammad EK, 2013), (Steindel SJ, Howanitz PJ, 2001). In 2001, a study evaluated the satisfaction of the physicians at the Emergency Department (ED) and reported that physicians are not satisfied with laboratory services, since the laboratory TAT caused delayed ED treatment and increased length of stay in ED. (Steindel SJ, Howanitz PJ, 2001). This concurs with Hawkins, (2007) findings that laboratory testing performed with long TAT affected patient release. (Hawkins RC, 2007). Many laboratories have had difficulties improving their TATs and no clear reasons for prolonged TATs are defined. (Elhoseeny TA, Mohammad EK, 2013),

(Steindel SJ, Novis DA,1999). More recent study done in six hospitals (3 public and 3 private) in Aden and showed that the lowest satisfaction score was reported from TAT, however, physicians in private institutes showed a higher satisfaction level.(Adulkader NM, Triana BE, 2013).

Mostly, staff shortages found to be associated with long TAT as a result of delay in the test ordering and collection. (Steindel SJ, Novis DA,1999). In contrast, a study performed in 653 institutions, participating in the College of American Pathologists Q-Probes program, for inpatients early morning routine clinical laboratory tests and found little evidence that longer routine test TAT affects patient length of stay. (Steindel SJ, Jones BA, Howanitz PJ,1996).On the other hand, faster TAT does not necessarily improving patient outcome as reported at Howanitz's study. (Howanitz PJ ,2005).

10. Results Accuracy

Laboratory quality can be defined as accuracy, reliability, and timeliness of the reported test results. The laboratory results must be as accurate as possible, all aspects of the laboratory operations must be reliable, and reporting must be timely in order to be useful in a clinical or public health setting. When making measurements, there is always some level of inaccuracy. The challenge is to reduce the level of inaccuracy as much as possible, given the limitations of our testing systems. An accuracy level of 99% may at first glance appear acceptable, but the resulting 1% error can become quite large in a system where many events occur, such as laboratory testing. Laboratories produce test results that are widely used in clinical and public health settings, and health outcomes depend on the accuracy of the testing and reporting. If inaccurate results are provided, the consequences can be very significant:

- unnecessary treatment; treatment complications
- failure to provide the proper treatment
- delay in correct diagnosis
- additional and unnecessary diagnostic testing.

These consequences result in increased cost in time, personnel effort, and often in poor patient outcomes. In order to achieve the highest level of accuracy and reliability, it is essential to perform all processes and procedures in the laboratory in the best possible way. The laboratory is a complex system, involving many steps of activity and many people. The complexity of the system requires that many processes and procedures be performed properly.(The Quality System Module1,WHO)

11. Quality Management

A quality management system can be defined as "coordinated activities to direct and control an organization with regard to quality." This definition is used by the International Organization for Standardization (ISO), and by the Clinical and Laboratory Standards Institute (CLSI). Both groups are internationally recognized laboratory standards organizations, and will be discussed later in the lectures. In a quality management system, all aspects of the laboratory operation, including the organizational structure, processes, and procedures, need to be addressed to assure quality. Quality management is as applicable for the medical laboratory as it is for manufacturing and industry. (The Quality System Module1,WHO)

12. Complexity of laboratory processes

There are many procedures and processes that are performed in the laboratory and each of these must be carried out correctly in order to assure accuracy and reliability of testing. An error in any part of the cycle can produce a poor laboratory result. A method of detecting errors at each phase of testing is needed if quality is to be assured. ISO standards group laboratory processes into pre-examination, examination, and post-examination categories.

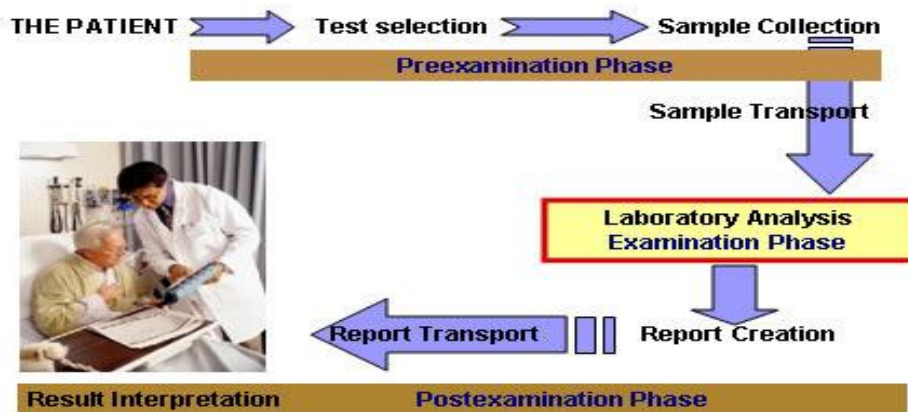
Comparable terms in current laboratory use include: pre-analytic, analytic, and post-analytic processes; or pre-test, test, and post-test processes.



13. Path of Workflow

The entire set of operations that occur in testing is called the Path of Workflow. The Path of Workflow begins with the patient and ends in reporting and results interpretation. The concept of the Path of Workflow is a key to the quality model or the quality management system, and must be considered when developing quality practices. For example, a sample that is damaged or altered as a result of improper collection or transport cannot provide a reliable result. A medical report that is delayed or lost, or poorly written, can negate all the effort of performing the test well.

14. Quality management system addresses all processes



The complexity of the laboratory system requires that many factors must be addressed to assure quality in the laboratory. Some of these factors include:

- the laboratory environment
- quality control procedures
- communications
- record-keeping
- competent and knowledgeable staff
- good quality reagents and equipment.

15. The quality management system model

The quality model used here organizes all of the laboratory activities into twelve

quality system essentials. These quality system essentials are a set of coordinated activities that serve as building blocks for quality management. Each must be addressed if overall laboratory quality improvement is to be achieved. This quality management system model was developed by CLSI1, and is fully compatible with ISO standards.(The Quality System Module1,WHO)



In the quality management system model all twelve QSEs must be addressed to assure accurate, reliable, and timely laboratory results, and to have quality throughout the laboratory operations. It is important to note that the 12 QSEs may be implemented in the order that best suits the laboratory. Approaches to implementation will vary with the local situation. Laboratories not implementing a good quality management system are guaranteed that there will be many errors and problems occurring that may go undetected. Implementing such a quality management system may not guarantee an error-free laboratory, but it does yield a high quality laboratory that detects errors and prevents them from recurring.

III. Research Methodology

1. Study Population / Sample

The actual population of this study was 105 physicians which included specialists

and general practitioners from Mandalay, Myanmar who regularly send their patients to the private laboratories in order to do the laboratory tests.

2. Sampling and Sample Size

The target population of this study was physicians from Mandalay including specialists and general practitioners from Mandalay who regularly send their patients to the private laboratories in order to do the laboratory tests. I will use/used Yamane equation to calculate the sample size of this research. Yamane equation is Where N = population size, and e = alpha level, i.e. $e = 0.05$ if the confidence interval is 95%. Because of time limitation, I intend to choose 5-7 big private laboratories which are very near to government general hospitals and located in one township. Total population N is around 133 physicians after calculating by using Yamane equation, the sample size will be 100 physicians with the confidence level of 95%.

3. Sources of Data

There are two data sources- Primary and Secondary for this study and for primary data source will be the descriptive questionnaires which are self- administered and completion type. The actual population consists of this study is 105 doctors which includes specialists and medical officers from Mandalay General Hospital, members of Myanmar Medical Association Mandalay, top general practitioners ,medical officers from private hospitals and NGO who refer their patients to five to seven private hospitals with attached laboratories & large-sized stand- alone laboratories in Mandalay. The secondary data source will be the research papers, journals and articles etc.

4. Methods of Data Analysis

This research will collect data using quantitative method. Respondents will be selected by the use of a random and convenience sampling technique. This technique is employed to solicit information from respondents who are available and willing to take part in the study. The instrument uses for data collection is a self- administer questionnaire. For the assessment of physicians' satisfaction, a self- administered questionnaire in both English and Myanmar was developed. Physician satisfaction paper-based survey of 5-Likert Scale, (1=very satisfied, 2=satisfied, 3=neither satisfied nor dissatisfied, 4= dissatisfied, and 5= very dissatisfied), was developed based on the CAP (College of American Pathologists) survey and other published similar studies.

The questionnaire consisted of (15) questions, evaluating different aspects of laboratory services including; the quality and reliability of the result, the efficiency of

laboratory personnel, laboratory management responsiveness, phlebotomy service and the TAT. I also included the questionnaire for socio demographic aspect. The questionnaires include both closed and open- ended questions. Face to face interviews were conducted with all level of doctors including physicians and general practitioners. The questionnaire was piloted on seven physicians including 1 specialist, 1 MSC student, 1 medical officer from government hospitals, 4 general practitioners and modifications were applied as per my professor's advice. The questionnaire was piloted on 26th March 2016 and data collection was completed on 29th July 2016.

Study population was physicians including specialists from government hospitals, medical officers from private hospitals, general practitioners, members of Myanmar Medical association Mandalay, medical officers from NGO who send their patients to five to seven big private clinical laboratories in Mandalay which are near from Mandalay General Hospital. Physician were approached individually and asked to complete the survey. In addition, I requested their opinions and comments when they are dissatisfied or very dissatisfied with laboratory services which can lead to better laboratory services and quality management.

This section entails the analyzing of data and interpreting data collected from the population sample. Data was analyzed using inferential and descriptive statistics. The descriptive statistics involves frequency table, likert scale while the hypotheses were tested using Analysis of Variance (Chi-square tests) the use of GNU PSPSS Statistical Analysis Software will be used to analyze data and generate frequencies and descriptive statistics and chi square test for the study.

5. Research Hypotheses

Hypothesis 1

H0 = There is no relationship between Efficiency of Laboratory Personnel (able to answer question) and physician's satisfaction

H1 = There is a relationship between Efficiency of Laboratory Personnel (able to answer question) and physician's satisfaction

Hypothesis 2

H0 = There is no relationship between blood collection service and physician's satisfaction

H1 = There is a relationship between blood collection service and physician's satisfaction

Hypothesis 3

H0 = There is no relationship between full range of laboratory services and

physician's satisfaction

H1 = There is a relationship between full range of laboratory services and physician's satisfaction

IV. Data Presentation and Analysis

1. Introduction

This was used to assess the level of physicians' satisfaction with 12 specific aspects of clinical laboratory services such as courtesy of clinical laboratory staff, laboratory manager responsiveness, phlebotomy service, laboratory test turnaround time (routine and urgent turnaround times), full range of laboratory test services requested tests are available and quality and reliability of results (congruence between the clinical laboratory results and signs, symptoms and response to treatment), laboratory information system (easier & clear clinical report format and reference range reported) and overall services of laboratory. Through an open-ended question, physicians were asked to indicate which of the 12 aspects of service was the most important to them. The collected data were processed into an electronic database for statistical analysis using PSPP, data analysis programs and. Descriptive analysis was used (frequencies, percentages, means and standard deviations with a confidence interval of 95%).

Descriptive Analysis

Table 1. Characteristics of physicians (n=105) who participated in the study, Mandalay, 2016

Characteristic	No	Percentage
Designation		
Specialist	25	23.81
General Practitioner	80	76.19
Age		
25-35	61	58.1
36-45	10	9.52
46-55	18	17.14
56-65	16	15.24
Service Length		

0-2 years	24	22.86
3-5 years	24	22.86
6-8 years	11	10.48
9+ years	46	43.81

The study was completed by one hundred and five physicians. The majority were general practitioners 76.19% (n=80) whereas specialists are 23.81% (n=25).

The respondents are between age 25-35 years 58.1% (n=61), age between 36-45years 9.52% (n=10), age between 46-55years 17.14% (n=18) and age between 56-65years 15.24% (n=16) respectively.

The majority of respondents had worked for 9+ years. In regard to service length, 46 respondents representing 43.81% were 9+ year, 11 respondents representing 10.48% were between 6-8 years, 24 respondents representing 22.86% were between 3-5 years, 24 respondents representing 22.86% were between 0-2 years.

Table 2: Service Categories

Service Category (%)	Very Satisfied	Satisfied	Neither	Dissatisfied	Very Dissatisfied	SD
Courtesy	2.86	67.62	21.90	6.67	0.95	0.69
Responsiveness	2.86	45.71	38.10	13.33	0.00	0.75
Blood Collection Services	5.71	69.52	18.10	6.67	0.00	0.67
Routine Test Turnaround time	2.86	60.95	20.95	15.24	0.00	0.79
Urgent Test Turnaround time	5.71	47.62	26.67	19.05	0.95	0.89
Full Range of Laboratory Services	5.71	55.24	22.86	15.24	0.95	0.86
Quality and Reliability of Results	5.71	55.24	33.33	5.71	0.00	0.69
Easy & Clear Rep (Lab Information System)	6.67	84.76	5.71	2.86	0.00	0.49
Reference Range (Lab Information System)	14.29	77.14	5.71	2.86	0.00	0.56
Professional Skill (Efficiency of Laboratory Personnel)	0.00	40.95	52.38	6.67	0.00	0.60
Able to Answer Qus(Efficiency of Laboratory Personnel)	4.76	39.05	38.10	18.10	0.00	0.82
Overall Services	1.90	59.05	28.57	10.48	0.00	0.71

Source: Original Research, n = 105

In this study, table 2 the result reflects the real quality of private clinical laboratories and service provided by private laboratories in Mandalay. For service categories, the highest rating was satisfied. We found out that the highest % of

satisfaction was for lab information system (easy and clear report (lab information system) (84.76 %), reference range reported 77.14% respectively) while the highest % of dissatisfaction was for laboratory test turnaround time (urgent test TAT 19.05% and routine test turnaround time 15.24%) and efficiency of laboratory personnel (able to answer questions) 18.10% respectively. Professional skill (efficiency of laboratory personnel) was found “neither satisfied nor dissatisfied” as the highest rating (52.38%), laboratory manager responsiveness (38.10%) and quality and reliability of results (33.33%). More than half of our respondents 59.05% were satisfied with overall laboratory services provided by private laboratories, in Mandalay.

TAT is one of the most noticeable indications of Laboratory service and is often used as a key performance indicator of laboratory performance, however, it is common for laboratories to hear from dissatisfied users that their test TATs generally are not fast enough. Physicians were not pleased with TAT for both urgent and routine tests for their patients. In daily reality, most common reasons for TAT delay were found to be shortage of highly trained personnel and machine breakdown followed by problems in machine maintenance. In addition, physicians are not sure for efficiency of laboratory personnel i.e laboratory specialists and team for their competency in all aspects; administration, communication, technical knowledge, skillfulness.

Subsequent analysis revealed that there were some differences in service categories based on the designation.

Table 3. Breakdown by designation of physicians' satisfaction,

Designation	P
Courtesy	0.059
Quality and Reliability of Results	0.244
Reference Range(Lab Information System)	0.082
Professional Skill(Efficiency of Laboratory Personnel)	0.210
Able to Answer Qus (Efficiency of Laboratory Personnel)	0.007 **
Full Range of Laboratory Services	0.097

source: Original Research, n=105

There is a relationship between physicians' satisfaction and designation in only one out of twelve laboratory service categories. It is efficiency of laboratory personnel (able to answer the question) with P value<0.01 (P=0.007)**.This result is statistically significant.

For the efficiency of laboratory personnel (able to answer questions), both specialists and General practitioners were satisfied with 39.05% while neither satisfied

nor dissatisfied was 38.10% it was noticeable that this area maybe the area need to improve in laboratory service categories.

Table 4. Breakdown by designation of physicians' satisfaction,

Laboratory services of Physicians Satisfaction with Age	P
Responsiveness	0.072
Blood Collection Services	0.002 **
Routine Test Turnaround time	0.303
Urgent Test Turnaround time	0.080
Quality and Reliability of Results	0.202
Professional Skill (Efficiency of Laboratory Personnel)	0.004 **
Full Range of Laboratory Services	0.121
Overall Services	0.094

Source: Original Research, n=105

The ratings for physician satisfaction were calculated for all the services categories according to age and the relationship was statically significant ($P < 0.01$) for 2 of the services categories out of 12 items under study. It is clear from Table that the second and sixth categories, for blood collection service and professional skill (efficiency of laboratory personnel), are statistically significant at the 0.01 level, that is $p < 0.01$. These imply that there are significant relationship between blood collection service and physicians' satisfaction and between professional skill (efficiency of laboratory personnel) and physicians' satisfaction with age at private laboratories in Mandalay.

Physicians, age between 25-35 were most satisfied 43.81% than the others. As blood collectors play in important role in the pre examination phase (blood collection to sample processing) and this phase account for the higher percentage of laboratory errors compare to examination and post examination phase. So it is needed to provide a regularly laboratory user's guidebook and a laboratory information searching system regarding the specimen collection and sample processing.

Table 4. Breakdown by length of services of physicians' satisfaction,

Length of Services	P
Responsiveness	0.018 *
Blood Collection Services	0.039 *
Routine Test Turnaround time	0.115
Urgent Test Turnaround time	0.157
Quality and Reliability of Results	0.031 *

Full Range of Laboratory Services	0.006 **
Reference Range(Lab Information System)	0.258

source: Original Research, n=105

There is a relationship between physicians' satisfaction and length of service in four out of twelve laboratory service categories. They are manager responsiveness, (P=0.018)*, blood collection service (P=0.039)*, Quality and reliability of results (P=0.031)* and full range of laboratory services (requested tests are available) (P=0.006)** respectively. Those results are statistically significant.

For full range of laboratory services, physicians with more than 9 years of length of service showed the highest satisfaction 31.43%. In daily reality private laboratories are trying to provide full range of laboratory services with advance machines. But some special tests are still needed to send to overseas laboratories. Moreover, private lab facilities are still higher than in public laboratories. It is possible that physicians having long experience could have a greater ability to discriminate the quality of services provided and the reliability of the results issued by the laboratory for diagnosis of different diseases.

Discussion of Quantitative Data Findings

Measurement of customer satisfaction brings customer preferences into the quality assessment process and corrects false assumptions about particular aspects of service, which customers value most. Today, assessing customer satisfaction with laboratory services is considered as an important component for improving the identified areas. Physicians are the primary customers of laboratory services and the most important and their satisfaction is considered an important factor influencing the quality of health care provision, patient compliance, and costs to health care systems. (Jones BA et al.;2009), (Zarbo RJ, Nakhleh RE, Walsh M;2003).

Dissatisfaction leads to a decrease in patient referral of physicians which has a negative impact on the profitability of private laboratories and brand image. Also, finding indicated the need for regular trainings on SOP (standard operation procedures), specialized testing methods, instruction and guidelines such as preparation of patients for laboratory tests, and the collection and handling of samples and periodical assessment of competency of laboratory personnel. The satisfaction with management of laboratory showed a very low satisfaction level, there is a major need of dynamic communication between laboratory and physicians especially with unclear, mistake and missing results.

According to the result, physicians selected Quality and Reliability of Results, Blood Collection Services, Managers Responsiveness, Professional Skill (Efficiency of Laboratory

Personnel) as being most important for them because delays in reporting laboratory results can lead to delay in the management, diagnosis, treatment and release of patients. Moreover, accuracy and reliability of the results can help the physicians for the right diagnosis and right treatment for their patients.

2. Research findings by face to face interview

The qualitative findings reveal that most physicians want to get good quality laboratory services. All respondents agree that better service quality leads to higher physicians' satisfaction. They raised their major concern for many aspects related to administration, communication, quality and reliability of the results, availability of ordered laboratory tests, delay in TAT, staffs' efficiency and blood collection service.

1) Service attitude laboratory personnel (Courtesy of clinical laboratory staff)

"Though I am quite satisfied with the laboratory staffs in their communication with doctors, they still should be good communicators when it comes to dealing with the customers. It is important to have patience for customers whether it is face to face or over the phone. I've experienced that some staffs are lacking these qualities which can make the customers annoyed while some staffs are really qualified and have good communication." 31 years old, Specialist

2) Service attitude laboratory personnel (Laboratory Manager Responsiveness)

"Still need to response some important issues. Most of the labs did not nominate responsible persons. Most of the managers know the customer's complaint when it is late and they neglect the problem and even take no action to it." 30 years old, Medical Officer from NGO

Communication is very important issue for laboratory staffs and all health care service providers. All the respondents highlighted that all the laboratory personnel should have good communication skills and it is needed to provide trainings on communication skill, customer care, handling telephone enquiries and how to answer enquires regarding special test procedures. The laboratory needs to create proper communication channel with doctors. The responsible laboratory manager needs to solve the issues or problems raised by doctors as soon as possible and give feedback about the solution of the problems once they have solved. All the respondents agreed that positive mindset of laboratory staff and good communication can lead to physicians' satisfaction.

3) Blood Collection Service

Need to explain detail instruction before blood collection. Need to ask some type of question for specific tests before blood collection and some new phlebotomists do not expert in collection of blood and did multiple puncture to patients. New phlebotomists should be well-trained before sending them into the market. 35 years old, Medical Office from Polyclinic

Generally, there is no comment for blood collection services. But the staffs should be aware of "uncuffed sample collection" for calcium tests and repeated needle insertion by unskillful staffs. 32 years old, MSC student (Medicine)

All respondents suggested that blood collectors should be well-trained and skillful staffs. They need to follow strictly standard operation procedures (SOP) when they draw the patients' blood. They need to explain the detailed information about blood collection procedure of the ordered tests especially for special tests to patients before they draw the blood. The blood collector should not prolong the patients waiting time to get blood drawing service.

4) Routine Test Turnaround time

Sometimes there were result delay in my patient this may be due to poor communication between lab and result delivery, poor communication between reports and return between morning and evening staffs. 50 years old, Key General Practitioner

The test results are usually available without delay, but sometimes there is no Pathologist's report (especially in Haemogram). 50 years old, Senior Medical Officer from Polyclinic

5) Urgent Test Turnaround time

The laboratory should plan a perfect system to give satisfactory urgent service. It should take example from American Pizza delivery service." 34 year sold, Medical Officer from NGO

"When we ask for K+ or Trop-T, it is very important that lab technicians should know that patient's life depends on the lab result and they must report it as soon as possible. But for the lab technicians, pathologist's remark is more important than saving the patient's life." 42 years old, Clinic Manager

"As far as I'm concerned, most of the urgent tests should be available within an hour. Some lab services take up to 3 hours to get the results, which is not very convenient especially for emergency patients." 30 years old, Specialist

"Urgent means to get result within half to 1 hr. But in there, urgent investigative takes 3-4 hr." 27 years old, Medical Officer from Polyclinic

In this study, doctors' comments indicated that laboratories do not meet clinicians'

expectations. Clinicians are seeking faster test results with quality assurance. The respondents encouraged all the laboratories to improve turnaround time (TAT) for both routine and urgent tests. If laboratory results provide essential information for patient diagnosis and treatment, it follows that more timely results will improve patient care. It is reasonable to assume that the improvement of TAT can greatly improve clinicians' efficiency, as well as help reduce required days of hospitalization for patients. Therefore, monitoring and enhancing timeliness of results reporting are fundamental to laboratory quality improvement.

6) Full range of laboratory test services

The patient's need to go to 2-3 lab to full fill the requirements. There are so many tests which are not available here even for the diagnosis of the disease. So the patients cannot get the specific treatment. 38 years old, Clinic Manager

Generally, I'm satisfied with routine blood tests. However, some important tests are still unavailable. Eg. Anti Acetylcoline Receptor Ab Testing. Some of the special tests are needed to send to foreign countries. 37 years old, Specialist

All the respondents agreed that the adequacy of test menu (availability of ordered tests) provided by laboratories is important for their patients. The laboratories should provide full range of laboratory tests and try to be available here of useful special tests which are currently sending to foreign countries. If the patients can get one stop and full laboratory service, the diagnosis and treatment of the disease will be faster.

7) Quality and Reliability of results

Some Results are not reliable and need to confirm. So, doctors need to send samples to 2-3 labs for confirmations. 30 years old, Medical Officer from NGO

To have the accuracy and precision in each test, the laboratory testing should be frequently checked and monitored by the professional laboratory personnel. Test methodology, instrumentation, use of correct and appropriate reagents and laboratory operations all contribute to the quality and reliability of results. 35 years old, Specialist

Physicians highlighted that accuracy, precision and timeliness of the laboratory results are important for them as well as for service providers and they encouraged the medical laboratories to adopt the quality standards. The importance of quality in the functioning of health care laboratories is well recognized globally; more importantly in developing countries. Reliable results produced by a laboratory improve the decision making capacity of the clinicians as well as public health physicians. On the other hand, the consequences of poor quality could be serious. It could lead to

inappropriate action or inaction leading to over treatment, over investigation or mistreatment, lack of treatment or inadequate investigations. Delayed or suboptimal responses as a result of poor quality of laboratory services could adversely affect the credibility of the laboratory and may also invite legal action. It is, hence, essential to develop and implement the quality measures in health laboratories such as properly designed laboratory room, adequate water and 24 hours electricity supply for proper reagent storage, regular and effective maintenance according to machines protocol, regular internal QC and external QC.

8) Lab information system (Reference range reported)

"Some reference ranges given by some labs are not internationally accepted range. There is also variation from lab to lab." 47 years old, Clinic Manager

9) Laboratory personnel are competent enough in their professional skill

"Most of them cannot handle some academic or laboratory questions." 32 years old, Medical Officer from Polyclinic

"Some of staff need to be competent an assigned duties & responsibilities and they need professional skill and communication skill." 47 years old, General Practitioner

10) Laboratory personnel are able to answer questions

"Only a few of lab personnel know the test is doing to diagnose for which disease. We still need to train about the background information of the tests requested by G.Ps in daily practice and some special test needs to do with caution like blood calcium test (be caution about squeezing of vessel)" 38 years old, Medical Officer from Polyclinic

"Depending on the questions, lab personnel find difficulty in answering the questions because some detailed questions such as (why should this test be done?) seems to be difficult to answer by a laboratory personnel. But this does not mean. The laboratory personnel are not competent in his/her work. Depending upon the level of question, there will be different in satisfaction." 40 years old, Specialist

The respondents agreed that all the laboratory personnel are needed to be professional and competent enough. The medical laboratories should focus competency development program me. Training for both short term and long term should be competency based and must be followed by post-training courses to provide a continuous support. If necessary, the laboratories should send their staffs to overseas countries for advanced technology training.

11) Overall Services of Laboratory

"Most of the labs are needed to improve their customer care, inquiry and issue handling. And laboratory results are still hard to believe completely." 28 years old, Medical Officer from NGO

12) Other Suggestions

"The laboratory should perform regular standardization with foreign labs in order to give reliable results. It is needed to improve communication skills. Laboratory should be upgraded in both laboratory equipment/ machine and also for the background knowledge improvement staff should to overseas training." 35 years old, Specialist (Medicine)

"The laboratory should try to provide useful tests that are still unavailable in Myanmar. The blood collectors should be punctual when it comes to home services and should not keep the patients waiting for blood collection for a long time without having breakfast. (According to my experiences). 24 hour laboratory service is advisable." 35 years old, Specialist

"Respective owners and managers need to provide necessary training in order to develop their staffs' skill and abilities and also for customer satisfaction." 45 years old, General Practitioner

"Local lab should provide the special tests that are available in foreign country because sometimes patients need to do such kind of special test urgently for their diagnosis. Like overseas country the result should be sent to the physicians via online service in order to prevent the result delay." 30 years old, MSC student (Medicine)

"As we live in developing country, only few hospital clinics can use fully automated machine, lab personnel need to do with caution in every steps when using semi-auto machine to fulfill the better results. Clinicians also need to describe a brief history about the patient (customer). By mean of this the lab technicians or microbiologist can check the result without difficulty is some abnormally high results." 45 years old, Senior Medical Officer Polyclinic

They also mentioned other suggestions including usage of internationally accepted reference range, usage of laboratory information system and consideration of maximizing computer use, for example, interfacing instruments, automatically verifying results, and making results available via computer, sending results directly to clinicians via the internet and upgrading the laboratory equipment and machines, all of which help gain much higher physician satisfaction.

V. Conclusion and Recommendation

1. Conclusion

The level of physicians' satisfaction with private laboratory services in Mandalay varies due to the differences in age group, designation and length of service of physicians. The study results presented that more than half of the respondents in Mandalay are not satisfied with the efficiency of services provided by the private laboratory. Major concern was raised on aspect related to administration/laboratory manager responsiveness, efficiency of laboratory personnel, communication, quality and delay in TAT. The efficiency and optimization of laboratory service need to be readdressed by the laboratory administration. In Mandalay, efficient medical laboratory services provided by skillful laboratory team are required so that all physicians can get the right diagnosis and choose the right treatment for their patients. Laboratory specialists and team must be competent in all aspects. They must be knowledgeable, skillful, professional, and good communicators. There are many aspects to be developed and there is a major need of dynamic communication between laboratory and physicians especially with unclear, mistake and missing results.

In addition there is a need to engage all related customers: nurses, patients, physicians, and administration in the process of development.

2. Limitations

This study had some limitations. It is the first study carried out in Mandalay based on doctors' satisfaction for the services provided by the private laboratories. It was conducted in 5-7 private laboratories and in only one city in Mandalay, thus the results could not be generalized and may not represent the situation in the country as a whole. I faced a rather poor level of cooperation of some doctors to complete the questionnaire in a reasonable time. Some doctors took 5-7 days to complete the questionnaire. The study lasted for four months. The names of the hospitals, clinic and laboratory are not allowed to mention in the study by some owners. Also the study considered one laboratory services customer "Physicians": other studies need to investigate the perception of other laboratory customers including, nurse and patients.

3. Recommendation

Because of the ever stronger emphasis on cost containment, changing consumer attitudes, and stiff competition, many of the successful hospitals and private laboratories of Mandalay should position themselves as "high-quality" laboratory

service providers and should try to implement the quality standard such as ISO 15189 & try to be an accredited laboratory in order to be ready to compete with international player who come and invest in Myanmar in very near future. Even those hospitals and laboratories that do not seek a high quality position should find it necessary to define, monitor, and improve the quality of the services they provide. It should be noted that technical quality alone, however, will not lead to increased revenues and facility utilization. For the long-run success of a health care organization, both functional and technical quality has to be monitored and managed effectively. Regarding Laboratory management responsiveness, administrators should understand the areas in which expectations are particularly high so that the service delivery process can be tailored to meet those expectations (Parasuraman, Zeithaml, and Berry 1985). Similarly, in order to identify and correct service quality problems quickly, laboratory administrators should understand physicians' perceptions of the quality of service delivered and the manner in which expectations and perceptions are balanced. There should be proper communication channel between the physicians and lab technicians or responsible persons of the lab so that they can work together to enhance their responses to clients' requests and enquiries, treat patients/ clients with high emotions and kindness and improve tangible assets of lab.

In Mandalay, only a few large private hospitals and stand- alone laboratories have already got ISO 9001/2008 (Quality Management System). A few number of established laboratories have maintain both internal and external Quality Control .They participated in external quality control program as well as proficiency testing program in overseas countries for quality control. So, every clinical laboratory should maintain both internal and external Quality Control and stringent with protocol by following SOP with calibrating equipment confirmed with the standards. During data collection, there is no private laboratories which focus on the implementation of quality standards, such as ISO15189 in Mandalay. The private laboratories should try to get ISO 15189 and international accreditation because accreditation benefits all stake holders. In addition accreditation results in high quality of care and patient safety. Efforts made to achieve accreditation may also lead to improvements in the management of laboratory networks by focusing attention on areas of greatest need and accelerating improvement in areas such as supply chain, training, and instrument maintenance. Laboratory accreditation may also have a positive influence on performance and help private laboratories to be ready to compete with upcoming international players. There should be a party responsible for monitoring the laboratories, in terms of compliance with international standards, for the establishment of integrated clinical laboratory, for provision of automated equipment and qualified technicians.

For the improvement of efficiency of laboratory personnel, the private laboratories

should provide regular training program including topics on sample to result work flow, standard operation procedures of all tests, specialized testing methods, advanced technology, automated and manual work. Every laboratory should have the laboratories instructions and guidelines such as preparation of patients for laboratory tests, and the collection and handling of samples, the manual, protocol guide and the references value booklets for their staffs.

"Myanmar's long-term income growth potential and gradual emergence of a middle class, coupled with the rapid influx of foreign tourists and expatriates, are expected to bode well for private healthcare providers. Myanmar is now ranking 148 out of 188 countries in 2014 UNDP Human Development Index compared with in the ranking for the previous year 2013 (150). Despite this progress, Myanmar remains one of the least developed countries in the world. On the other hand, the World Health Organization has ranked Myanmar at 190th position out of a total of 191 countries in terms of 'overall health system performance'. So, both public and private health care sectors should try to cooperate and improve our health performance. There should be knowledge sharing program between public and private sectors. Further studies like clients and clinicians satisfaction with laboratory services should be performed in both private and public sectors. Further study with a large sample size and more factors is recommended.

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The geographical location and notable industry trends of Myanmar

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ABSTRACT: Myanmar has been growing at a high rate of 8% since the inauguration of President Taines in 2011, after reforming the economy and improving relations with Western countries such as the US and the EU. Currently, the gross domestic product per capita is only 1,300 dollars, but it is a geographical point of border with China, India, Thailand, Laos and Bangladesh. Neighborhood market is big and the productionable population (15-64 years old) is 70% of the population. In addition, the labor cost is low at half the level of Vietnam and it is regarded as a 'sleeping giant market' and a 'promising future production base'. This study examined industrial trends in Myanmar and draws implications.

Key words : Geographical location, Industry, Consumer market, Economic policies,

I. Introduction

Myanmar has been under military regime since the 1988's. In May 1997, the United States introduced the sanctions. It has received sanctions from Western Empire. November 2010, fought the general election in 20 years. The following year in March, the current President Thein Sein was sworn. Accordingly, it was transferred from the military in civil affairs. December 2011, the progress of democracy were evaluated from the United States. The US secretary of state (Hillary Clinton) was visited. It was an opportunity to return to the international community. After that, the British Prime Minister Cameron visited there in April 2012. In November, President Obama visited. April 2012, President Thein Sein visited Japan. 2013, Japanese Prime Minister has visited Myanmar. Japan has expressed an earnest support(Yen loans etc). Also, it is carried out large-scale .infrastructures and economic development of Myanmar were displayed.

That is spurring the move is the next event. Issues relating to Cheomgak islands in Okinawa. Thereby one, China's country risk. The following is a surge in labor costs of Thailand, Vietnam, and Indonesia ect. by China Plus One. Myanmar became a new area of economic development in Southeast Asia. Referred to the company's

management entered China, Thailand, etc., as follows: The Last Frontier Asia or the best place in Thailand Plus One. The hottest area of interest to attract attention from abroad. Currently increasing number of large-scale economic mission from each country. Local business community says: NATO(No Action Talk Only) or 4L(Look, Listen, Learn and Leave). It has a low ratio to the actual business. Economic and social conditions in Myanmar are as follows.

II. Main subject

1. Survey of Myanmar

(1) The basic Myanmar

Myanmar Ministry was formed in the British colonial era. Long from north to south. More than four times the area of the Korean peninsula with 677 000 square kilometers. In the Southeast part of the continent. And it has the largest land area. Half of the land(mainly part of Northeastern) is in forests. Land side, having contact with the border five countries, including China, Thailand, Laos, India, Bangladesh. Located at the end of the ocean to the west. The Eyawadi river flows through the center of the country in portrait. A length of more than 1,600km. The river passes 960km away from Yangon to Mandalay. The voyage of the ship is possible. South of making a fertile delta areas.

Most of the country is tropical, sub-tropical regions belong to. As the variety of topography, climate change is also apparent. Temperature and precipitation are significantly different depending on the region. Season is divided into two. The rainy season due to the southwest monsoon (May to October). The dry season due to the northeast monsoon (November to April). The population exceeds 60 million people. Among them, 70% of the Burmar people. In addition, a multi-ethnic country consisting of 135 people. 90% are Buddhist, Christian 5%, Muslim 4%. Capital is a Nyepidow. In 2006, it turned from Yangon. The population is about 60 million.

(2) Exchange in Myanmar

Thein Sein government has promoted various economic measures. One of them is the unification of the exchange rate since April 2012. Until then, the government approved rates & market rates, the two were side-by-side. The Real Deal was done with the market rate. However, from April 2012, changed the management fluctuations traded. The exchange rate that the central bank was published monthly basis. The

exchange rate was unified and stable.

In Myanmar, the military regime had continued since 1988. The election was conducted in 1990. The opposition(NLD, led by Aung San Suu Kyi) was overwhelming victory. But the junta refused to transfer power. 2003, Kinnyung premier has instituted a 7 step roadmap to democracy. In 2008 a new constitution was adopted by referendum. November 2010, the elections were conducted successfully in 20 years. March 2011, the current Thein Sein regime was democratically born. 2015, election was conducted. The opposition(Aungsan sujii) was overwhelming victory. In 2016, the presidential election was. But Aung San Suji was not able to run in the presidential election by the Constitution. This is because family members of foreign nationality.

2. The geographical significance of Myanmar in Southeast Asia

Myanmar is surrounded by the following 5 countries. China, Laos, Thailand, India, Bangladesh. Border amounts to 6,000km. In particular, it faces two largest economies(China, India). Thailand(a lot of expansion in the automotive industry) also faces. The present value is higher in geopolitical terms.

(1) economic relations with neighboring countries

a. Yunnan Province of China(not in contact with the sea): the role of transit of energy supplies and distribution. China's greater presence on the Myanmar economy. Pipelines (gas and oil) installations ranging full-length 1000km from western Myanmar(Ciaopyu) to Yunnan.. The China Petroleum (CNPC) is responsible for the establishment. Gas is expected to increase to Guizhou, and oil is to Chongqing.

b. Thailand: It is important as a logistics route to the Indian Ocean. Dawei special economic zone in southern plans to develop by Itarutai Inc.. That is transfer land of labor-intensive industries and commercial of high value environment. But it has been delayed by lack of funds.

c. India: aid to Myanmar's roads. By 2016, which it will be connected to the Thailand by the Asian Highway.

(2) Myanmar as the consumer market.

Let's take a look at the population of Myanmar and neighboring countries. Myanmar is 61million. The combined population of the countries bordering the border such as China and India is 2.839 billion people. It amounted to 40.6% of the world's population. Myanmar is located in the center of a huge market.

Logistics artery of Southeast Asia are following two.

a. East-West Economic route: a north-south line through Myanmar in Thailand. Da Nang of Vietnam -Peninsula Indonesia - Myanmar (1,500km). Following extends from

Myanmar to India as Asian Highway. This is the idea of India.

b. Southern route economies: in Vietnam's Ho Chi Minh City to Bangkok. Thailand is thought to extend to the terms of the Dawei in Myanmar. So, they try to create a logistics hub across the Andaman.

3. Myanmar Economic status

(1) Myanmar Economic Environment

Myanmar was participating in ASEAN in 1997. The last runner to a franchise with Laos in the same year and Cambodia in '99. These three countries are called CLM Empire. But international attention in Myanmar should not be compared with the other two countries. Dec. 2015, officially launched the ASEAN ECONOMIC COMMUNITY including Myanmar. Economic integration is to free the customs, immigration and investment in the region in 10 countries. In addition, Myanmar's economy is going to be absorbed into the acceleration paste the ASEAN economies. In 2013, SEA Game was held in the capital Naypyidaw. It can be said ASEAN plate Olympics. 2014 was also the Chairman country ASEAN. These things will facilitate domestic economic growth. Myanmar's GDP is \$ 51.9 billion based on 2015. Per capita is \$ 832. It falls short of even \$ 1000. It is not only one-sixth of Thailand(similar populations). In this regard, greater room for growth in Myanmar. In the configuration of GDP, Agriculture is the largest 36.4%. 10 points higher than in mining(26%). The further increase the share of mining.

(2) Thein Sein regime's economic policies

To set a five-year plan 2011-2015. It took a higher annual growth rate of GDP to 7.7%. GDP per capita was also planned to raise 1.7 times. In addition to economic growth, and promote the transition of industrial structure. And to raise the proportion of industry in GDP from 26% to 32.1%.

In addition, there contains the following information.

a. Social infrastructure maintenance: Use the aid funds from abroad. to business of education, healthcare, communications, roads. Diversifying power sources as hydro, natural gas and coal, etc.

b.. modernization of agriculture: Promote agricultural development by utilizing micro-finance

c. Privatization of state-owned businesses: telecommunications, electricity, education and financial sectors etc.

d. The introduction of foreign capital actively: Revised Foreign Investment Law, the promotion of investment through the improvement of land relations policy.

e. The creation of domestic employment: Promote the return of talents abroad.

Currently about 300 million people.

In accordance with these policies, plans to equip the poverty rate from 26% to 16%.

(3) The Myanmar economy is expected to grow in the medium to long term

As GDP growth, the government took an average of 7.7%. ADB had forecast a 5.5%, 6.0% and 6.3% growth in 2011, 2012 and 2013 each. Even the IMF, seen by more than 6-5% late. Everyone expected a stable high growth.

(4) factors that support economic growth in Myanmar

It can be given by the four factors to support the growth Myanmar.

a. The increase in the working-age population: Myanmar has a structure that increases the working-age population. The average age is 27 years old. Moreover, this situation is expected to continue. Thailand was converted in 2015 to a reduction in the peak. Meanwhile, Myanmar will continue until 2030. The future will be returning overseas workers up to 300 million people. It is leaning to entering the labor market in Myanmar. By returning a high intellectual level, people also will rise the level of the overall labor market.

b. The increase of foreign capital in accordance with social infrastructures and urban regeneration: Social infrastructure maintenance is a top priority for Myanmar.

Most foreign investment is heading to the field.

c. The privatization of state-owned business and substantiality of education

d. Activation of consumption and economic activity.

large shopping centers in Yangon city are facing. And a boom with the middle class or above. The combination store chain also has advanced. The financial institutions such as credit card digits is going to hold.

4. Industry Trends in Myanmar

(1) social infrastructure (power, transport, communication, etc.)

The biggest risk factor of social infrastructure in advance of Myanmar. In particular, it is urgent that power shortages. It should be switched from the current flagship hydropower. The measure is necessary for the aging of gas-fired power generation. Transmission and distribution losses (25%) also must reduce. It is also urgent maintenance of social infrastructure (transport, communications, etc.). Demand is high, investment is expected to rise. This field is a need for a technique of Korea.

(2) Agriculture

Myanmar has a long land vertically. Width is approximately twice that of Thailand, it

is suitable for agriculture. North is a cold, dry mountain areas. It is suitable for the production of seeds and fruits. Southern (Yangon, etc.) have a lot of rainfall. Therefore, it is suitable for crops in the fertile delta terrain. Rice is the main agricultural products. Production is 3,320 million tons (in 2010). Currently, the sixth largest producer in the world. Until the Second World War, it was the world's largest rice exporter. Currently, the world's top 10 or so. Myanmar government, support the export of rice as an axis of economic growth. Then transferred to the civil administration, agricultural development was a priority. However, there remain only a primary industry. The development of a workpiece, plus the added value is required. However, the lack of technology and equipment. The great potential of the agriculture sector in Myanmar. Therefore, many Japanese companies are scrambling to carve business. For example, Mitsui: rice industry, Marubeni: rice, shrimp export business to Japan, Ito: til-related industries. Mitsubishi has introduced the prospect that the sesame business is promising. In northern Myanmar, such as the banana fruit is grown well. Ito is also considering expanding its business partnership with US companies. However, there still does not have a major hand in the Western Group. This may be an advantage rather than opportunities. By entering from the agricultural sector, to create a foothold in the field.

(3) agricultural materials and equipment

75% of the population (45 million people) live in rural areas. And most of them are engaged in agriculture. Also most of which belong to the poor. Their Sein government has designated a proposition to reduce poverty at the national level. The following two are necessary to that end. Improve farmers' living, productivity improvement and modernization of agriculture. To this end, the government is expected to introduce advanced technology equipment of the agricultural sector. It is expected to increase demand for advanced farming tools. Also, demand will surge of pesticides and fertilizers.

(4) Natural gas

Since 1999 began exporting gas through a pipeline to Thailand. The natural gas production was booming since about 2000. Production in recent years, about 400 billion cubic feet. It is currently No. 1 in exports. Accounting for about 40% of export amount. According to the Asian Development Bank calculations, Reserves are 11 trillion and 800 billion cubic feet. China is active in natural gas. China oil pipeline was buried, And the role of the energy supply in Yunnan.

(5) Sewing industry

It is the first export-oriented manufacturing sector of Myanmar. Since 2000, apparel

products accounted for half of all exports. For the United States was 54%. But in 2003, the United States embarked on full-scale import ban. Myanmar has been a big hit. At this time, Japan has emerged as a savior. In 2010, Japan became the first place. Sewing product exports for 2010 is approximately \$350 million. It has increased almost doubled in 2009. Japan 45%, Korea is 30%.

(6) Metal resources

Myanmar has abundant resources buried. It is now not well developed the following three reasons. Security and technology, the lack of funds. The main metal resources is a copper, zinc etc. Copper production has exceeded 30,000 tons in 2005. However, with the withdrawal of foreign capital it has decreased. In 2011 it fell to 10,000 tons. Zinc is also a congested state. As for metal resources is possible the participation of foreign companies. Recently, increasing the participation of Chinese companies.

(7) Industrial materials (cement, etc.)

The infrastructure has been progress in recent years. Accordingly, the cement demand is growing. In 2010, cement consumption is only 5020 tons in Vietnam, Thailand was 2,450 million tons. In contrast, Myanmar was only 470 million tons. Hydro power plants is mostly made decades ago, and it is inefficient. The repair work is needed in the future. Therefore, the expected shortage of cement. It should also address the deterioration of roads, Rail maintenance is also an urgent problem. The average speed is 30km railway in Mandalay - Yangon (621 km). The hotel Construction is also active. Therefore, demand for cement is going high.

(8) Automotive

The Japanese car seems a lot. Then. the Korea car is. Japanese cars are Toyota accounted for 80%. From autumn 2012, and it eased import restrictions on cars. Therefore, the import of used cars is growing. However, maintenance and other related industries are still insufficient. The height of the automotive industry is expected in the future.

(9) Service Industry

Still they lack a lot of social infrastructure. So many disabilities are currently in advanced manufacturing. So there is still a big step forward. The faster expansion rate in the service sector is relatively light. And it expected future full-scale expansion. The following industries are doing business locally. Advertising agency, law firms, real estate agents, etc. Besides, there are a lot of computer-related companies advanced. It aims to hire IT-related majors. This field is popular with women. In recent years, NTT has advanced to Yangon. Size is of about 500. Medicine is often popular in Myanmar.

Then there are IT related. Among them, 90% are women. Men prefer School of Medicine, and most are employed by foreign countries. Women prefer the IT-related. And efforts to increase female employment.

There is a bigger attraction mobile phone market. 2010, mobile phone penetration rate was 1.24% (Survey of the International Telecommunication Union). It is currently close to 50%. However, it is still low compared to Cambodia (70%) and Laos (80%).

(10) Retail Industry

The traditional retail (the so-called papa, mama Store, etc.) accounted for 90%. The city has entered a shopping center. Japan's convenience store chain also plans to enter. Promote the consumption of the middle class is expected. The high average annual growth rate of over 17% is expected.

III. Conclusion

1. In the Southeast part of the continent. And it has the largest land area. Land side, having contact with the border five countries, including China, Thailand, Laos, India, Bangladesh.
2. From April 2012, changed the management fluctuations traded. The exchange rate that the central bank was published monthly basis. The exchange rate was unified and stable.
3. 2003, Kinnyung premier has instituted a 7 step roadmap to democracy. In 2008 a new constitution was adopted by referendum. November 2010, the elections were conducted successfully in 20 years. March 2011, the current Thein Sein regime was democratically born. 2015, election was conducted. The opposition(Aungsan sujii) was overwhelming victory. May 2016, the presidential election.
4. China's greater presence on the Myanmar economy. Pipelines (gas and oil) installations ranging full-length 1000km from western Myanmar(Ciaopyu) to Yunnan.. The China Petroleum (CNPC) is responsible for the establishment. Thailand is important as a logistics route to the Indian Ocean.
5. The combined population of the countries bordering the border such as China and India is 2.839 billion people. It amounted to 40.6% of the world's population.

6. Myanmar was participating in ASEAN in 1997. Dec. 2015, officially launched the ASEAN ECONOMIC COMMUNITY including Myanmar. 2014 was also the Chairman country ASEAN. Myanmar's GDP is \$ 51.9 billion based on 2015. Per capita is \$ 832.

7. In the configuration of GDP, Agriculture is the largest 36.4%. The further increase the share of mining. Thein Sein, set a five-year plan 2011-2015. It took a higher annual growth rate of GDP to 7.7%. In addition to economic growth, and promote the transition of industrial structure. And to raise the proportion of industry in GDP from 26% to 32.1%.

8. It can be given by the four factors to support the growth Myanmar. The increase in the working-age population. The increase of foreign capital in accordance with social infrastructures and urban regeneration. The privatization of state-owned business and substantiality of education. Activation of consumption and economic activity.

9. Industry Trends in Myanmar

(1) social infrastructure (power, transport, communication, etc.)

(2) Agriculture: North is a cold, dry mountain areas. It is suitable for the production of seeds and fruits. Southern (Yangon, etc.) have a lot of rainfall. Therefore, it is suitable for crops in the fertile delta terrain. However, there remain only a primary industry. The development of a workpiece, plus the added value is required. However, the lack of technology and equipment. The great potential of the agriculture sector in Myanmar.

(3) agricultural materials and equipment: 75% of the population (45 million people) live in rural areas. And most of them are engaged in agriculture. Also most of which belong to the poor. The government is expected to introduce advanced technology equipment of the agricultural sector. It is expected to increase demand for advanced farming tools. Also, demand will surge of pesticides and fertilizers.

(4) Natural gas: Production in recent years, about 400 billion cubic feet. It is currently No. 1 in exports. Accounting for about 40% of export amount. China is active in natural gas.

(5) Sewing industry: It is the first export-oriented manufacturing sector of Myanmar. Since 2000, apparel products accounted for half of all exports. Sewing product exports for 2010 is approximately \$350 million. Japan 45%, Korea is 30%.

(6) Metal resources: Myanmar has abundant resources buried. It is now not well developed the following three reasons. Security and technology, the lack of funds. The main metal resources is a copper, zinc etc. As for metal resources is possible the participation of foreign companies. Recently, increasing the participation of Chinese companies.

(7) Industrial materials: The infrastructure has been progress in recent years. Accordingly, the cement demand is growing. Hydro power plants is mostly made decades ago, and it is inefficient. It should also address the deterioration of roads, Rail maintenance is also an urgent problem. The hotel Construction is also active. Therefore, demand for cement is going high.

(8) Automotive; From autumn 2012, and it eased import restrictions on cars. Therefore, the import of used cars is growing. However, maintenance and other related industries are still insufficient. The height of the automotive industry is expected in the future.

(9) Service Industry: The following industries are doing business locally. Advertising agency, law firms, real estate agents, etc. Besides, there are a lot of computer-related companies advanced. This field is popular with women. There is a bigger attraction mobile phone market.

(10) Retail Industry: The traditional retail (the so-called papa, mama Store, etc.) accounted for 90%. The city has entered a shopping center. Promote the consumption of the middle class is expected. The high average annual growth rate of over 17% is expected.

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Gender Difference of Career Barrier Perception and Career Development Preparation*

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ABSTRACT: This study was carried out to examine the gender difference of career barrier perception and career development preparation to promote women's economic activity. The participants of survey were 576, women were 281 and men were 295. The analysis was performed by SPSS. 22.0. The results are as follows. First women reported more career barriers than men in work-family compatibility significantly. Men reported less scores in opportunity of developing career. Second, Students regardless of sex prepared career development similarly at the middle level. Third, Male reported significantly higher scores of self-efficacy than female. So it is suggested that much diverse work-experience programs should be developed and provided to women. The work-family compatible policy should be enforced until the gender equality come into wide perception.

Key words : Gender equality, career barrier, career development, career preparation

I. Introduction

The economic activity participation rate and college entrance rate of women has been increased. The women to enter college has exceeded men in the rate since 2009 when the rate was 84.0%, 83.5 respectively. But the gap of the employment rate has not been lessened. The employment rate of women in 2014 was 49.5%, which was very low rate in comparison with men's 71.4% (Statistics Korea, 2016).

The labor force population has been getting to decline due to decrease of birth and increase of aging. So women's career development has been an important issue because the talented women who graduated from college could contribute to society and substitute for deficiency of labor. Government has supported to develop women's

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career with project for women center.

But women still have difficulty in getting a regular or permanent job in labor market. They usually occupy the low-wage jobs or temporary jobs. Women leave easily their work when they were married or had to rear child. The reason has been said that the work barrier such as gender inequity or gender discrimination and difficulty in work-family compatibility of workplace. In addition to these social problem, the lack of competence for work performance and low self-efficacy of women has reasons.

So this study examine the difference of gender in perception of career barrier, career preparation and self -efficacy. Lot of researches found the problems of society and women's career, but there is rare study on the comparison between women and men attending in college. With this comparison, the reason of women's problem will be clearer than in the research on one gender. The results from this study may contribute to make policy for women and labor force.

II. Theoretical background

Park & Lee (2014) found that the gender role and decision-making type influenced on the barrier to develop career. The research was conducted by survey of 216 college students. Park & Lee(2013) researched on the career preparation of 323 female college students. They showed that the career decision-making autonomy and career decision affected on career preparation behaviors, and the relation was mediated by self-efficacy. Min(2011) showed that the female students who participated in the program provided by university were positive in preparing career and getting jobs. Won(2015) revealed that job satisfaction was influenced by discrimination and work-family compatibility especially maternity leave and child-care leave. According to the research Lee & Lee(2012), the success of employment was affected by major in college, perception of future job and information for jobs.

III. Method

1. Sample and Data

The survey targeted the university students attending Suncheon National University in Korea. The data were collected by purposeful sampling method using questionnaire from March to April 2016. The total number of participants of this study was 576. The women among them were 281 and men were 295.

Table 1 presents characteristics of the participants. As to participants' sex, 48.8% of participants were female and the remainders were male. With regard to education level, the first year students were 12.3%, second year students 29.0%, third year students 31.6% and forth year students 27.1% respectively. 57.3% of participants reported their major was literature or sociology and 42.7% pf them reported engineering or agriculture.

Table 1. Descriptive Characteristics of the Participants

variables	Categories	n=576	%
Sex	Women	281	48.8
	Men	295	51.2
Education level	First year student	71	12.3
	Second year student	167	29.0
	Third year student	182	31.6
	Forth year student	156	27.1
Major	Literature or Sociology	330	57.3
	Engineering or Agriculture	246	42.7

2. Measurement

Career barrier perception were defined as frustration by discriminating against sex, education, appearance or age, by being incompatible with family life of childrearing and housework and by being unable to build career through experience, information, empowerment, opportunities. The 10 questions based on the research of Park & Lee(2014) and Won(2015) were surveyed.

With regard to Career development preparation, the participants were asked to rate the extent to which they did their own decision making for the future, planning for career, and gathering information for jobs based on the research of Min (2011) , Lee & Lee(2012) and Park & Lee(2013).

Self-efficacy concept was defined as competence to overcome difficulties, to handle impediment, to challenge everything, to accept failure, to do what they want, and to resolve problems based on the research of Park & Lee (2013) and Youn(2015).To measure these variables, participants were asked to estimate each items by the 5

point Likert scale from 1 to 5.

3. Data Analysis

The statistical analyses were performed using the SPSS 22.0. The description were conducted with statistics such as mean, standard deviation, and percentage. To investigate the gender difference between female and male, t-test was performed. The correlation method was used for exploration of relationship among career barrier perception, career development preparation and self-efficacy variables.

IV. Results

1. Gender Difference in Career Barrier Perception

Table 2 shows the gender difference in perception of discrimination, work-family compatibility and building career. The t-test revealed no significant difference between genders in sexual discrimination, educational discrimination and appearance discrimination and age discrimination. Students perceived highly educational discrimination but they showed similarly middle level in other discriminations regardless of sex.

Women reported more career barriers than men in work-family compatibility significantly. Female students rated significantly less scores in childrearing and housework than male did, which meant that women perceived higher career barrier deriving from marriage. In the other side, men reported less scores in opportunity of building career, which meant that men had perceived less opportunities than women has perceived in building career.

Table 2. Gender Difference in Career Barrier Perception

(n=female 281; male 295)

Category	Factor	Gender	M	S.D	t
Discrimination	Sexual	female	2.25	0.94	-1.66
		male	2.39	1.05	
	Educational	female	1.98	0.96	-0.14
		male	1.99	0.97	
	Appearance	female	2.59	1.01	-1.47
		male	2.72	1.08	

	Age	female	2.69	1.03	
		male	2.66	1.07	-1.07
Work-Family Compatibility	Childrearing	female	1.57	0.70	-6.74***
		male	2.01	0.86	
	Housework	female	1.95	0.76	-4.23***
		male	2.23	0.81	
Developing Career	Experience	female	1.65	0.69	-0.93
		male	1.71	0.79	
	Information	female	1.79	0.72	-0.96
		male	1.85	0.79	
	Empowerment	female	1.70	0.83	-0.98
		male	1.77	0.85	
	Opportunities	female	2.44	1.18	2.41*
		male	2.19	1.29	

*p<0.05, ***p<0.001

Less score means to perceive higher career barrier.

2. Gender Difference in Career Development Preparation

Table 3 shows the gender difference in career development preparation such as deciding the future, deciding job, planning career and gathering information. The t-test revealed no significant gender difference in any questions. Students regardless of sex prepared career development similarly at the middle level.

Table 3. Gender Difference in Career Development Preparation

(n=female 281; male 295)

Factor	Gender	M	S.D	t
Deciding the future	female	3.62	1.03	-0.17
	male	3.64	1.07	
Deciding job	female	3.44	1.12	-1.53
	male	3.57	0.99	
planning for career	female	3.52	1.02	-0.11
	male	3.53	0.99	
Gathering information for jobs	female	3.30	1.07	-1.36
	male	3.41	1.01	

*p<0.05, **p<0.01, ***p<0.001

3. Gender Difference in Self-Efficacy

Table 4 shows the gender difference in self-efficacy to overcome difficulties, to handle impediment, to challenge everything, to accept failure, to do what they want and to resolve problems. Male reported significantly higher scores of self-efficacy than female. This results mean that female has low competence to accomplish career in workplace. So it is suggested that much experience to work should be provided to women.

Table 4. Gender Difference in Self-Efficacy

(n=female 281; male 295)

Factor	Gender	M	S.D	t
Overcoming difficulties	female	3.63	0.84	-2.18*
	male	3.79	0.83	
Handling impediment	female	3.49	0.86	-3.28***
	male	3.72	0.83	
Challenging everything	female	3.37	0.90	-3.46***
	male	3.63	0.90	
Accepting failure,	female	2.95	0.97	-4.62***
	male	3.32	0.98	
Doing what they want	female	3.41	1.00	-2.01*
	male	3.57	0.91	
Resolving problems	female	3.07	0.91	-3.91***
	male	3.37	0.92	

*p<0.05, **p<0.01, ***p<0.001

V. Conclusions

First, women reported more career barriers than men in work-family compatibility significantly. Female students rated significantly less scores in childrearing and housework than male did, which meant that women perceived higher career barrier deriving from marriage. Students perceived highly educational discrimination but they showed similarly middle level in other discriminations regardless of sex. In the other side, men reported less scores in opportunity of building career, which meant that men had perceived less opportunities than women has perceived in building career.

Second, Students regardless of sex prepared career development similarly at the middle level. Third, Male reported significantly higher scores of self-efficacy than female. This results mean that female has low competence to accomplish career in workplace. So it is suggested that much experience to work should be provided to women.

On the bases of these results, this study suggests some implications in marketing policies to encourage young women to be laborer continuously in workplace. It is suggested that work-family compatible policy to enforced until the perception improves gender equality. Furthermore diverse and much work-experience programs should be developed by relevant organization in university.

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STRATEGIC ISSUES OF THE 6TH INDUSTRIALIZATION FOR THE CREATION OF HIGH-VALUED FOR MYANMAR

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ABSTRACT: Myanmar is presently recording 8% of faster economic growth and higher purchasing power in global market. Myanmar is considered as the geographic hub on the border China, India, Thailand, Laos and Bangladesh. It has an abundant labor force of low wages, but a country with a poor infrastructure. Myanmar is under new government promote agricultural reform and modernization to improve the quality of agricultural labor more than 70% of the population and imports of fertilizers and machinery related to agriculture are presently increasing. Also promoting the mechanization of agriculture, vigorous support and economic development policy of agriculture-oriented, education and training for farmers are lively implementing now. This research proposes tasks for development of agriculture and several strategies to expand the agricultural sectors in Myanmar. The 6TH industrialization surely contributes to economic development and growth through higher value-added creation in Myanmar agriculture.

Key words : 6TH industrialization, Myanmar, agriculture, creation added-value. type of 6TH industrialization

I. Introduction

The figure of present Myanmar is similar to the level of South Korea in the 1970s. Democracy National Union, led by Aung San Suu Kyi in the general election of 2015 November (NLD) is landslide victory to termination of the military in the election, was kicked off the first civilian government era has began in March 30, 2016. It has accepted the elements of capitalism, however, it has still a political form of a strong military dictatorship. There are still remained many aspects of socialism.

"The economic development of the democratization-oriented" is the slogan of new government. It means that economic development of Myanmar is the top priority of

new government. Although the future of economic plan for Myanmar is not yet to be embodied, economic development of the agriculture centered, infrastructure development such as transportation, communications, and power, the improvement of the foreign investment environment, etc are strongly expected intensively to be improved in near future.

In such an environment for the sake of economic development, rural development urgently needs for Myanmar 70 percent of the population are living in rural areas. The agricultural sector is primary industry in Myanmar. Despite of high possibility of development in agriculture, agricultural investment has grown at a sluggish pace.

The passive foreign investment promotion policy of the Myanmar government and poor infrastructure such as roads, power, communication dedicates to the lack of agricultural investment. When new government tries to invest efficiently on the agricultural sector, it could lead to the economic growth in Myanmar.

Looking at the features of Myanmar of the industrial structure, the promotion of the primary industry to the 6TH industrialization will be meaningful for the economy development. The 6TH industrialization based on the primary industry related to agricultural food product can be powerful alternative to overcome regional crisis coming from the growth of secondary, tertiary industry.

6TH industrialization in agricultural section might be not only relating to the primary industry but extending the area to the secondary industry and tertiary industry, it brings the new value in rural areas and creates new employment elderly and women. It will be the business and activities to create their own opportunities.

Therefore, this study attempts to suggest the development strategy of rural industry in Myanmar. The creation of high value-added agriculture will strongly contribute to the economic development in Myanmar. In other words, we would like to propose the challenges of development and strategies that can be extended to the agricultural sector of the primary industry in the 6TH industry.

II. Economic situation and industrial structure in Myanmar

1. Economic Situation

Since the new government was established in 2011, the policy of economic development in Myanmar had been intensively promoted. In the result of that, 7% of economic growth had been recorded.

Myanmar of economic indicators, including per capita GDP and the percentage of the industrial structure is similar to that of early stage of South Korea's economic

development in 1960s-1970s.

Table 1. Expected annual economic growth rate of Asian countries including Myanmar(unit : %)

	2012	2013	2014f	2015f	2019f
Myanmar	7.3	8.4	8.5	8.5	7.7
Cambodia	7.3	7.4	7.0	7.0	7.3
Laos	7.9	8.0	7.4	7.5	7.4
Thailand	7.3	2.8	0.9	2.5	3.3
Vietnam	5.2	5.4	6.0	6.5	6.0
Indonesia	6.0	5.6	5.0	4.7	6.0
Malaysia	5.5	4.7	6.0	4.7	5.0
Philippines	6.7	7.1	6.1	6.0	6.5
Singapore	3.4	4.4	2.9	2.2	3.2
Brunei	0.9	-2.1	-2.3	-1.2	11.2
India	5.1	6.9	7.3	7.3	7.7
China	7.7	7.7	7.3	6.8	6.3
Bangladesh	6.3	6.0	6.3	6.5	7.0
Korea	2.3	2.9	3.3	2.7	3.6

Source : IMF, World Economic Outlook, 2015. 10.

Myanmar borders to China, India, Thailand, Laos, and Bangladesh. It has been strongly attractive as the future manufacturing base with the great number of population and a flourish purchasing power. The structure of population in Myanmar shows productive population (15-64 years) labor force including 70% of the total population and the population is below 27 years old accounted for 50% in Myanmar, With such as rich number of productive population, labor costs are lower than other Southeast Asian

Trade balance of Myanmar has been continuously increasing since the from 2012 to 2013. Trade deficit is also consistently increasing from importing machinery and oil.

Myanmar mainly exports the most products of the primary industry such as the natural gas, clothing, jade, rice, beans, etc. On the other hands, Myanmar imports raw material for building infrastructure and production such as machinery, transport equipment, refined mineral oil, base metals, etc. 10 import and export items for Myanmar is following.

Table 2. 10 Import and Export items for Myanmar in 2014-2015

(unit : in millions of dollars,%)

Export		Rank	Income	
Item	Amount (Ratio)		Item	Amount (Ratio)
Natural gas	5,179(41.4)	1	Machinery and transport equipment	4,945(29.7)
Clothing	1,023(8.2)	2	Refined mineral oil	2,448(14.7)
Jade(Jade)	1,018(8.1)	3	Basic metals, manufacture	1,932(11.6)
Rice	652(5.2)	4	Electronics, appliances	1,038(6.2)
Black beans	470(3.7)	5	Edible vegetable oil	562(3.4)
Corn	393(3.1)	6	Plastic	516(3.1)
Green beans	369(2.9)	7	Artificial or synthetic fibers	343(2.1)
Seafood	250(2.0)	8	Cement	301(1.8)
Bean trees	208(1.7)	9	Medicine	300(1.8)
Sesame seeds	182(1.5)	10	Fertilizer	259(1.6)
Sum	12,524(100.0)	-	Sum	16,633(100.0)

Source : CSO, Korea International Trade Association(<http://kita.net>)

Myanmar has items that are mainly exported are natural gas, clothing, jade, rice, cereals, and the like. Among 10 major export items 9 items are natural resources or agricultural products except clothing as manufactured goods.

Overseas garment companies from Japan and China have entered to produce products and they export their products. In the result of that, total amount of export of garment exceeded \$ 1 billion for the first time in the year 2013 increased significantly from \$ 700 million in 2012.

The largest trading partner of Myanmar is China. Since China announced the benefit of tax exemption of agricultural, marine, and mineral products in 2014, which account for 95% of Myanmar exports trade volume has been increasing rapidly. From 2014 to 2015 it has increased 60.4% compared with the previous year. It mainly traded with neighbor countries such as Thailand, India, Hong Kong, Japan and Singapore.

The main investment areas of South Korea, in the past, mining, transportation industry, and manufacturing industry. It has been expanding to finance, insurance, real estate, and the construction industry, etc. in recent years. The trade volume with Myanmar has decreased by 15.5% compared to the previous year and Myanmar was recorded the 64th trading partner of South Korea in 2015. Exports in 2015 decreased by 17.5% compared to the previous year. It shared 0.1 percent of South Korea total exports. Imports in 2015 was reduced by 12.8% compared to the previous year, but the main imported goods such as clothing, agricultural products, personal belongings,

miscellaneous goods are increased up to 27.8 percent.

2. The Industrial Structure of Myanmar

Myanmar is estimated that the development potential is very high due to abundant natural resources and mineral resources, vast territory, and cheap labor, etc. It recorded a 7% economic growth after 2012. It is estimated as a country with high potentiality of rapid economic development. Myanmar shows the industrial structure of a high proportion of agricultural primary industry.

Table 3. Changes of Industries in Myanmar

Primary Industry			Secondary Industry			Tertiary Industry		
2002/03	2011/12	2013/14	2002/03	2011/12	2013/14	2002/03	2011/12	2013/14
52.89%	35.2%	31.8%	12.75%	26%	28.8%	35.3%	37.8%	39.4%

Source : Korea Institute for International Economic Policy, development projects in Myanmar and South Korea - Myanmar Development Cooperation, 2013,p.24.

Agriculture is a strategic national industry accounts for a significant part of the Myanmar economy. Agriculture also occupies an important position in economy since the share of agriculture occupies 32.8% of GDP. Rice is the main export items of Myanmar. Myanmar is the world' top rice exporter and rice shares the half of the agricultural output in the country. Despite underdeveloped transportation infrastructure and processing in this country, their exports are increased 6% from 2013 to 2014 and with the efforts of government.

New government of Myanmar actively has promoted agricultural reform and modernization to improve the quality of life in agricultural sector where more than 70% of the population settles. Therefore, gradual increasing imports of fertilizers and related machinery can be observed. Also for promoting strong policy of economic development, Myanmar government offers vigorous support to agricultural sector with the mechanization of agriculture, education and training for farmers.

Major export items of Myanmar are natural gas, clothing, jade, rice, and bean, etc. Among 10 major items, clothing is the only industrial products. The rest are all natural and agricultural products.

Amount of natural resources like oil and gas attracts foreign companies that are interested in. More than 90% of jade production in the world is from Myanmar and ruby and sapphire are also major product of Myanmar. In addition, this country has

rich forest resources. Myanmar is the world's largest producer of solid wood and teak. Secondary export items of Myanmar is garment and agricultural products are manufactured in the country. Clothing industry is increasing each year as the second export item of Myanmar.

III. The 6TH industrialization

1. The concept and type of 6TH industrialization

The 6TH industrialization is defined as activity of to create a new value-added on the whole process from producing to sales based on the resources in the rural areas. Manufacturing from the production, processing and integration agricultural materials, distribution and sales, promoting tourism for cultural experience, or healing education are major sources of regional creation of new jobs. " (2014, KREI, 2013, Ministry of Agriculture, Food and Rural Affairs)

Frame of the 6TH industrialization are the following.(2016, EPIS; Korea of Education, Promotion and Information Service in Food Agriculture, Forestry and Fisheries)

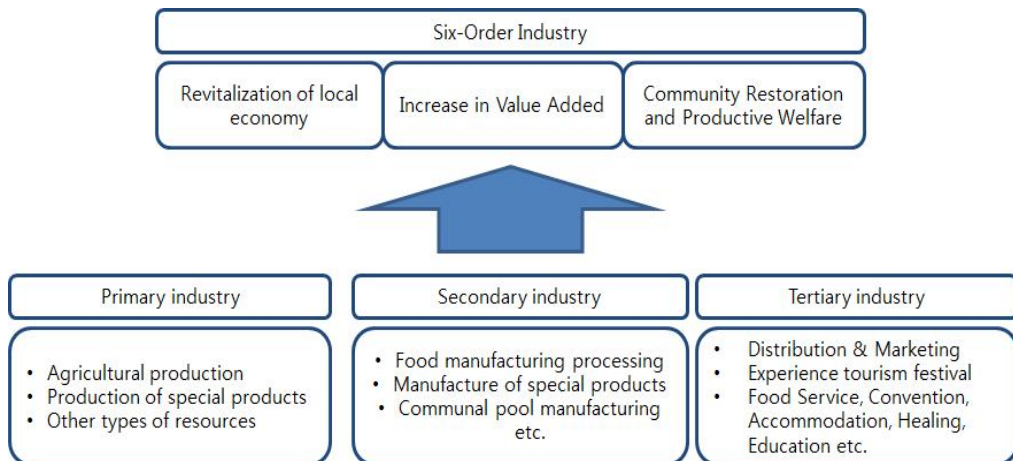


Figure 1. Frame of The 6TH Industrialization

Data source: 2016. Website of EPIS; Korea of Education, Promotion and Information Service in Food Agriculture, Forestry and Fisheries

In the farming village. agricultural and livestock products produced directly, traditional technology from various farmers such as fermented soy products, traditional

wine, crafts, construction, traditional music and dance, intangible cultural products, festival, custom rituals, and the beautiful natural landscape are widely scattered.

The objective of 6TH industrialization is activation of regional economy through customized industrialization for individual area to satisfy various needs and want of consumers.

The 6TH industrialization of agriculture pursues several objectives; to take advantage of the various resources of the region leading by local residents, including the elderly and women, involving from the production, sale, by integrating an alternating current, etc. It creates a new value it allows activation of the local economy, to increase added value of the product, and to pursue recovery and productive welfare of the community.

With the change of market environment such as the trend of global market, the low-priced agricultural product imported vastly, the price of local agricultural products suddenly fallen sharply, serious income gap appeared between urban and rural area. The concept of 6TH industry came into the picture in South Korea as the solution of this problem. Immediate deployment rural economic activation is the objective of 6TH industrialization. While aging is carried out rapidly in Korea, the aging of the farmer population, a decrease in agricultural productivity, of course, the demand for social welfare due to the aging population has increased. In addition, the consumption patterns of food in Korea has changed along with the increase in eating outside because of the modern busy lifestyle of people, increasing of one-person households, skyrocketing increasing elderly group, increasing anxiety for the food-safety gradually. It also contributed the emergence of 6TH industry. And the number of urban citizens felt more and more difficult to be a city residents under the various change of environment. They try to find possibility from rural area and they attempt to move to farm village. Not only retirees but also young people are now pursuing their dreams from the 6TH industrialization.

Such changes of environment make Korean government implement the 6TH industrialization policy. Job creation, safe production and consumption of agricultural products, the possibility of creation and regional economic activation of added value of the produced agricultural products are expected by the 6TH industrialization policy. Table 4 following below shows the background of emerging the 6TH industrialization.

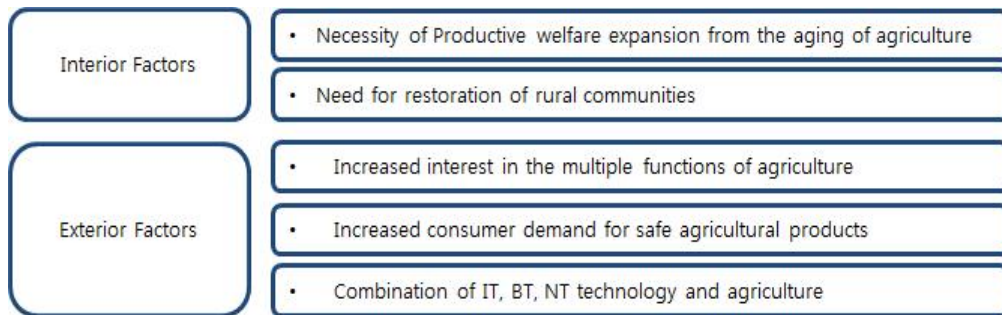


Figure 2. Background of Emerging 6TH Industry

Source: <https://www.epis.or.kr/index.do>

2. Type of the 6TH industrialization²⁾

The Korea Rural Economic Institute presented three type of 6TH industrialization. (2013, Korea Rural Economic Institute; Figure 3)

Community type-oriented on the local community, which is the first type, through the improvement of job creation and income for the elderly and women, are intended to recover the local community. This model is a method of trying to commercialization by the producer group of agricultural production corporation and regions to manage from production to processing and sales. it is possible to obtain a range of economic effects, Primary industries division will be participant for thid type. This type of community is a suitable model for rural small and medium-sized and mountainous region. In addition, this model, a variety of agricultural products of production, expansion of processing facilities, must be pursued, such as the development of the distribution agencies.

The second type is th franchise. This is similar to contract trade. Diffusion of new technology, increasing valued-added, and guaranteed of sales can be objectives of this type. Leading farmers/center-oriented and contract trade among leading farmers and many small-sized farmers are utilized for franchise type. Leading farmers and small-sized farmers participate for franchise of course. This Franchise type is effective on horticulture and livestock industry. This type used to promote fostering producers and promoting regional agriculture and economic of linkage.

Franchise type utilizes trade contract with the small farmers of the region (merchants) between agricultural production corporations and companies

2) Kim Tae-gon, Hur Jun-yon, Yang Chanyoung, the concept and business start-up of sixth-order industrialization in agriculture, Korea Rural Economic Institute pp.6-11, 2013.

Type	Objectives	Means	References
Community (Regional community)	<ul style="list-style-type: none"> • Creating Job for seniors - women • Increasing Income • Recovery of regional community 	<ul style="list-style-type: none"> • Producer Group- oriented • Combination of producing, processing, and sales • Participants: Primary Industries Division 	<ul style="list-style-type: none"> • Suitable for small-business and middle-sized mountainous region • Existing task for producing varied material agricultural product, extending processing facilities, developing distribution channel. • economic feasibility of coverage
Franchise (Contract trade)	<ul style="list-style-type: none"> • Diffusion of new technology • Increasing value-added • Guaranteed of sales 	<ul style="list-style-type: none"> • Leading Framers/ Center-oriented • Contract trade among leading farmers and many small-sized farmers • Participants: Leading farmers and small-sized farmers 	<ul style="list-style-type: none"> • Actively used in horticulture and livestock Industry • Yielding fostering producers and promoting regional agriculture • Economic of linkage
Network (Solidarity type of agriculture, Industry, commerce)	<ul style="list-style-type: none"> • Developing new market • Creating new value • Building regional recycling economy 	<ul style="list-style-type: none"> • Production-Service sector-oriented • Federation of different industries • Participants: Primary, secondary, tertiary industry workers 	<ul style="list-style-type: none"> • Advantageous for Big-sized area of production and Big-sized Business.

Figure 3 : Type of the 6TH industrialization

Source: Kim Tae-gon, Hur Jun-yon, Yang Chanyoung, the concept and business start-up of sixth-order industrialization in agriculture, Korea Rural Economic Institute, 2013. p.11

Such as food service industry, the baking industry, and apparel brand, agricultural production corporation and companies as the franchise headquarters are implementing guidance and value-added improvement of new technologies to small farmers. Simultaneously They fully guarantee the sale of the product. This model have been actively utilized by horticulture farmers and livestock farmers. This model derives benefit of the economic efficiency of cooperation.

Final type of the 6TH industrialization is network. Means of this type are production-service sector-oriented and federation of different industries. Network Model which take place in a wide range of agriculture, industry, and commerce by making full use of complex linkage. Network type pursues new value through new product development, branding work, and the formation of the circulation of the local economy. This type takes the cooperation scheme among different industries and it revolves around the primary, secondary industry and service, which is tertiary industry. Type of network is a method suitable for large-scale production areas and big-sized companies.

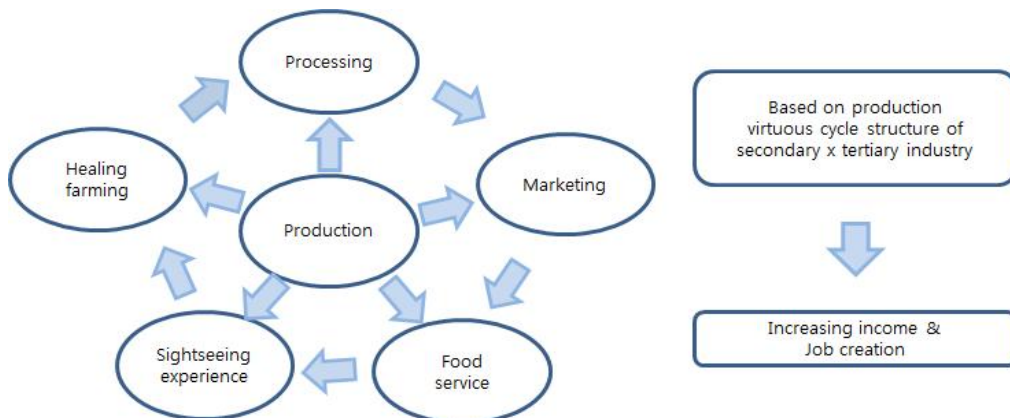
On the other hand, Seo Yeunjung categorized the 6TH industrialization into 3 type; type I: classified under industry type and subjective agent (farmer, village, corporation, and region), type II: classified sources of revenue model, type III: classified under system of business project. Each systematic type of the 6TH industrialization are followed.

Main agent	Primary Industry-centered	Secondary Industry-centered	Tertiary Industry-centered
farmer	<ul style="list-style-type: none"> Eun-A ranch in Yeojoo, Kyunggi 	<ul style="list-style-type: none"> Have been Haenam in Jeonnam 	<ul style="list-style-type: none"> Château Meeso in Yougdong, Chungbuk
Village	<ul style="list-style-type: none"> Eoco-Tourism of mountain village in Pajoo, Kyunggi 	<ul style="list-style-type: none"> Cheese village in Im-sil, Chunbuk 	<ul style="list-style-type: none"> Haedam village in Yangyang, Kangwon
Corporation	<ul style="list-style-type: none"> Songgang plum garden In Chilgok, Kyungbuk 	<ul style="list-style-type: none"> Korean traditional sweets with ginger in Seosan, Chungnam1 	<ul style="list-style-type: none"> Apple wine in Yaesan, Chungnam
Region (Municipality)	<ul style="list-style-type: none"> Raspberry in Gochang, Chunbuk Woodland of retinispora in Jangheung, Chunnam 	<ul style="list-style-type: none"> Vio-vally for Chinese medicine in Jaechun, Chungbuk Oriental raisin tree in Jangheung, Chunnam 	<ul style="list-style-type: none"> Green Barley festival in Gapa-Do, Jaejoo island Local food in Wanjoo, Chungbuk

Figure 4. Type I of 6TH industrialization promotion

Major industry such as primary, secondary and tertiary and type of main agent are based of classification of the type I of the 6TH industrialization promotion. Each dimension has examples selected among successful cases.

The following figure shows type II of 6TH industrialization promotion. This type is classified into 6 categories according to sources of revenue model.



Type	Sources of revenue model/ Successful cases
Production -centered	<ul style="list-style-type: none"> • Core business is production and processing service is additional service • Importance of vitalizing production section through secondary and tertiary industry • Ex) Eco-village in Mundang of Hongsung, longevity-village in Okchun, etc.
Processing -centered	<ul style="list-style-type: none"> • Core concept is processing products applied consumer needs • Secure various distribution channel such internet, consignment sale, etc. • Ex) Sticky corns in Gunwee, Hoepo village in Seosan, etc.
Marketing-centered	<ul style="list-style-type: none"> • Construction of spatial interconnection system of production and marketing • Ability of managing local food outlet. • Ex) Farmers market in Chilgok, Peoples in farm managed by the retired, etc.
Sightseeing experience-centered	<ul style="list-style-type: none"> • Participating in processing product is the key- point • Interconnecting various tangible with intangible resources in the region • Ex) Red-pepper Paste village in Sunchang, Pumpkin-lamp village in Youngin, etc.
Food service-centered	<ul style="list-style-type: none"> • Production, processing, food service are simultaneously operated. • Telling story about ingredient for food, honesty, flavor taste • Ex) Moon-rising village in Namwon, Flower bud village in Seosan
Healing-centered	<ul style="list-style-type: none"> • Interconnecting functionality and medicinal agricultural cultivation with value • Enforcement of professionalism such as psychological and physical therapy • Ex) Wild chive village in Yangyang, Sky-earth- village in Hadong, etc.

Figure 5. Type II of 6TH industrialization promotion

Final type of 6TH industrialization promotion is based on system of business project.

System of business project	Characteristics and successful cases
Diversified business type by farmers	<ul style="list-style-type: none"> • Farmers are main agent and handling production and various business based on agriculture. • Ex) Experience village of Dalgogae-ramie in Seochun
Networked business type affiliated with other industry	<ul style="list-style-type: none"> • Farmers specialize producing their agricultural products, which related businessman cooperates with processing and service based on agriculture. • Ex) Jangdan-soybean in Pajoo.
Combination type (Combination of polygon and isomorphic network)	<ul style="list-style-type: none"> • Diversified business and networked business running simultaneously and interactively in same area. • Ex) Bongpyung-buckwheat in Pyungchang

Figure 6. Type III of 6TH industrialization promotion

As mentioned above, type of 6TH industrialization could be diversified according to the various factors.

3. Cases of the 6TH industrialization in Korea

The case of the 6TH industrialization in Korea is followed. (Figure 7)

Region and Festival/Brand (organizer)	Theme	Major Items	The Results
Gapa-do, Jaeju Island (Committee for Green-barlely Festival)	<ul style="list-style-type: none"> Cultivation, marketing, experience of Green barley 	<ul style="list-style-type: none"> Green barley 	<ul style="list-style-type: none"> 25,000 tourists were infused by the hosting of festivals utilizing green barley which is self-sufficient resources of the local community. Creation of new income sources for local agriculture and fisheries (45 million Won) Promoting and positioning Gapa-do as sightseeing site
Im-sil Cheese Town (Management Committee of Cheese Town)	<ul style="list-style-type: none"> Experience of rural lifestyle Milk Processing Factory Tour 	<ul style="list-style-type: none"> Cheese Yogurt Organic Rice Exchange Program between Urban and Rural area(experience program, festival) 	<ul style="list-style-type: none"> Annual visitors: 70,000 Annual sales: 1.7 billion Experience sales :1.2 billion; Sales revenue: 500million) Job creation: 51(7 full-time, 25 operator, par 19 daily employees) Distribution of income to local residents (66.4% of sales, distributed to 84 people) Regional development fund: 220 million won (2009 ~ 2012) Dairy factory and 7 cheese studio Various awards
Yeojoo Eun-A Ranch (Owner of Private ranch, Eun-A)	<ul style="list-style-type: none"> Dairy Industry 	<ul style="list-style-type: none"> Milk Cheese Yogurt Cookie 	<ul style="list-style-type: none"> Sales amounted to about 600 million (milk production: 380 million Won, dairy farming experiment: 190 million Won, dairy products sales: 5 million Won, pension rental fee; 5 million Won) - 11 thousand visitors (Korean: 5,000; foreigners: 6,300)
Have been Haenam (Hyunsook, Yang)	<ul style="list-style-type: none"> Producing Korean traditional sauces 	<ul style="list-style-type: none"> Soybean Paste Red pepper paste Soybean sauce Cheonggukjang (fast-fermented bean paste) 	<ul style="list-style-type: none"> Annual turnover: 480 million Won (2012) World Agricultural Technology Award Patent registration of manufacturing technology (Red pepper paste, Soybean paste) Regional Job Creation: Employing 2000 Employees a Year Revitalization of regional circulation economy

<Figure 7> Selected Cases of the 6TH industrialization in Korea

Data source: successful case selected from "Successful Cases of 6th Industrialization", 2013. MFAFRA(Ministry of Agriculture and Food and Rural Affairs) and RDA(Rural Development Administration)

Jeju Chongbori(green barley) festival of the Cheju island has created big amount of regional income through offering the great experience of the refreshment in the greenish filed to tourists and selling green barley product. The number of participant of Chongbori festival are 25,000 people in 2012. In addition, it established a position as a tourist destination and promotion of Gapa-do.

Im-sil Cheese Town is one of the most successful case of 6TH industry in Korea.

The number of visitors has reached 70,000 and annual sales have recorded 17 billion won (1.5 million US \$). In addition, it matches the results of job creation of 51 people local residents. 66.4% of the income has been dividend to 84 people local residents and Imsil Cheese Town has recorded a variety of award-winning with the best practices of the 6TH industrialization.

Another case of the six-order industrialization is 'We went to Haenam'. A farming cooperative corporation of Haenam has selected the traditional fermented soy paste products as major items; chilly paste, fermented soybean paste, and soy sauce as major items. Annual sales of this corporation were a record 480 million won (2012) and acquired. Also, soybean production was registered for patent, and local jobs were created (2000 people as part-time annually). It is being evaluated as a good example of active regional circular economy.

IV. Challenges and Strategies of the 6TH industry

Myanmar has rich rainfall, fertile soil, tropical climate which are providing an optimal environment for agriculture. Farming in Myanmar has special meaning more than just industry.

Despite of the high growth potential agricultural investment is sluggish due to poor infrastructure such as roads, power and communications to be considered. The Government of Myanmar shows the passive foreign investment policy when agricultural investment. But the future of agriculture of Myanmar is very high potential for development if only effective investment to agriculture is supported by Myanmar government. The 6TH industrialization of agriculture is to raise the value of agriculture due to secondary and tertiary industry development. For this industrialization, the process of active innovation is necessary. At the same time, the innovation of the production planning and production processes and sales strategies for new markets and demand generation are required.

The perspective of regional producers of local businesses is important for the 6TH industry.

The first task of development of 6TH industrialization is supply of products that consumers needs and wants, the extension of distribution channel, and creation of job. Through those procedures over income is ultimately pursued.

The second task is supply of various agricultural products which consumers can trust in processing with safety, peace of mind, health, etc.

The third challenge is the development and manufacturing of agricultural and livestock production. The specific analysis of the productivity and the situation of

competition can be the source of lucrative profit.

Next challenge must attempt to keep going interactive exchange between urban and rural areas through the sale of agricultural products and food processed.

Voluntary participation of residents is essential for the successful sixth-order industrialization.

Local residents by themselves must be aware of the problem facing the region and share those problems each other and attempt to solve regional issues. However, activity of business is used to cease within the business scope of government assistance in most cases.

Next, the person in charge of knitting the value chain called "production→processing→sales ⇒ customers should be nurtured not only responsible for the production.

Finally, establishing the evolution of the related-based ecosystem must be built by offering coordinator who will assist the 6TH industrialization.

By fusing such as agricultural production and direct trade, natural resources and culture, rural landscape, etc, development of a business model that provides a strong value proposition is proposed.

Strategy for the 6TH industrial development that may be fused, conjugated of primary, secondary, and tertiary industries. In other words, to be able to perform an independent activity and correlated between each sector such as production, processing, sales products must be accomplished. And it can operate and manage the whole procedure having a mutually shared goal of business.

The second strategy is to build a base foundation for the exchanges, including producers and consumers, sellers need each other and need a variety of activities and exchanges them through business diversification, exchange.

As final strategy, we need a complex model of rural resources through a network of other related agencies, local farmers, and other organizations. In other words, it will be a complex area management as horizontal diversification in agricultural production, processing specialty products, agricultural products retail, tourism and exchanges. Vertical diversification in the sixth industrialization and the Agricultural solidarity can expect a variety of activities, including franchises.

V. Conclusion

Myanmar is presently recording 8% of faster economic growth and higher purchasing power in global market. Myanmar is considered as the geographic hub on the border China, India, Thailand, Laos and Bangladesh. It has an abundant labor

force of low wages, but a country with a poor infrastructure.

New government just has started in this year is committed to infrastructure maintenance, improving foreign investment climate, development of agriculture-driven economy, eco-friendly energy supply plan prepared, transport, communications, energy.

Myanmar is under new government promote agricultural reform and modernization to improve the quality of agricultural labor more than 70% of the population and imports of fertilizers and machinery related to agriculture are presently increasing.

Also promoting the mechanization of agriculture, vigorous support and economic development policy of agriculture-oriented, education and training for farmers are lively implementing now.

This research proposes tasks for development of agriculture and several strategies to expand the agricultural sectors in primary industry. The 6TH industrialization surely contributes to economic development and growth through higher value-added creation in Myanmar agriculture.

In summary, the challenges of the development of the sixth-order industrialization are; the expansion of income and employment due to market development, ensuring the supply of a variety of processed agricultural products, production and processing of agricultural and livestock products through improved productivity, and it is intended to sustainable urban rural exchange through the sale of agricultural products and processed food. Sixth industry development strategy requires nurturing business leaders, producers and interacting consumers with merchandiser through the business diversification strategy. At the same time, related agencies, there is a need for a strategic network of local farmers, related agencies and other organizations.

Myanmar holds enormous growth potential if they effectively develop those potentials, it can expect fast economic growth in very short period of time. Processing and excellent quality of the seeds spread and agricultural machinery and local exports and production of fertilizer of agricultural products is promising. Considering agricultural development near future, demand of agricultural machinery and fertilizer is expected. Japan -ASEAN national companies prepare the local production system in Myanmar by a joint venture. On the other hand, the World Bank as '12 Year Logistics Index (Logistics Performance Index, LPI) showed 129 position and lowest area of the 155 countries. This index is a comprehensive index to measure the degree of development of the country, such as transport infrastructure, customs administration and logistics industry. Myanmar is underdeveloped state of infrastructure such as serious power shortage. Power of rate is only 26% in Myanmar. it brings a chronic lack of foreign investment. And it has been rated as very poor transport infrastructure. In addition, acquiring reliable statistics about market is very difficult and published statistics is also less with low reliability. Frequent changes of government policy make researchers gather reliable statistics about market. Therefore, foreign investors try to

develop strategies considering local environmental factors.

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A Theoretical Study on the Quality of Life of Middle-Aged and Elderly Women in Korea

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ABSTRACT: The life span becomes longer, there are lifestyle changes among the elderly as they need more living expenses compared to the past. Those who start to face old age and have not prepared for it suffer from serious poverty. In addition to physical aging, they face difficulties in overcoming these problems and resort to the difficulty of living with the help of others. Many studies have shown that the quality of life is higher when people are living in a healthy and independent life, and that social activities including volunteering and economic activities that utilize recreational activities increase the life satisfaction among middle-aged and elderly women. In this study, we conducted a literature study to improve the quality of life of middle-aged and elderly women in Korea.

Key words : Quality of life, Middle-aged and elderly women, Employment, Work participation

I. Introduction

The average life expectancy of women is 6-7 years longer than men, and the percentage of elderly women aged 65 or older is about 60% (Korea National Statistical Office, 2010). The proportion is so large that some say that in order to solve the problems of the elderly, it has to start with solving the problems of elderly women. In addition, since elderly women have double vulnerabilities for being a woman and an elderly, the problems they face are much more serious than that of elderly men. Thus, the inequalities experienced by women in a gender-discriminatory social structure causes economic problems such as poverty in the latter half of their lives, and they also face health-related problems due to various family activities including childbirth so they cannot help but be vulnerable in their old age.

Laslett (1991), a historian who predicted 100 years of human life, defined the age after 50 (50-57 years old) as the middle age, or the third life stage; this is also the peak of one's life and a period of personal accomplishments. Various personal achievements can guarantee the quality of life of people in their old age. In other words, the middle age and old age can be thought of as adjacent periods that cannot be separated from each other.

Middle-aged and elderly women experience various life events such as physical aging, watching their children complete their education and become independent, meeting their grandchildren, retirement and bereavement of their spouse. From a psychosocial point of view, it can be expressed as a time of tension and conflict between the duality of the loss of youth and the maturity of an individual (Kong Yoo-jin, 2003). They face a combination of problems such as existential crisis - "Who am I?", "What have I lived for?"—as well as retirement, loss of opportunity, decline of health and body, change of relationship with old parents or children, and so on (Kim Ae-sun, Yoon-jin, 1993; Kim Myung-ja, 1989).

The problem is that as the life span becomes longer, there are lifestyle changes among the elderly as they need more living expenses compared to the past. Those who start to face old age and have not prepared for it suffer from serious poverty. In addition to physical aging, they face difficulties in overcoming these problems and resort to the difficulty of living with the help of others.

In the case of the elderly in Korea, their purpose of continuing work even after retirement is to supplement their 'cost of living' or 'lack of living expenses' through livelihood labor. It was found that the 45.1% elderly poverty rate in Korea is the highest among the OECD countries (Ryu Gun-sik, Kim Dae-hwan, 2011). The economic problems that middle-aged and elderly women face will be more difficult if they do not have an experience in the labor market or even if they do have experience, it might have been for only a short period of time with little compensation.

As a result, employment activities of middle-aged and elderly women are necessary desires for them and in an important incident (Han Kyung-hae, Roh Young-joo, 2000; Arber & Ginn, 2003), Han Kyung-hae and Roh Young-joo's study states that middle-age employment is the most urgent thing in responding to the changes in old age and to plan for their future lives. In this way, the employment of middle-aged and elderly women is an experience of an individual's maturity and independence. As a result of entering the labor market, they feel a new sense of value, self-identity, and self-worth, so their employment can have a different meaning from men's achievements (Yoon Hae-gyung, 2007).

Based on these facts, the Korean government has been working on the elderly job project in 2004 with the aim of solving various problems among the elderly and improving the social perception of elderly manpower by providing economic opportunities to supplement deficient income, promote health, and provide opportunities for active social participation.

The case in Korea wherein the government directly promotes the work of the elderly using the state budget is unique, but a project is currently underway with its name recently changed to 'Elderly Employment and Social Activity Support Project' in 2016. This project aims for all the members of the society to not cut off their income

due to unemployment and to maintain their independence through possible economic activities.

As a result of the national efforts in consideration of the positive aspect of old age, the research of Korea National Statistics Office (2015) showed that the number of elderly workers increased by 70,000 nationwide, and the proportion of simple laborers (36.1%) was the highest, followed by agriculture and fishery laborers (29.1%), service sales workers (14.7%), and functional machine operators (12.5%). The participation of elderly workers will continue to increase due to aging.

Rather than its own worth, the work of middle-aged and elderly women put more significance in self-realization and value-realization, which were neglected in their youth. Thus, they feel more confident and useful in being able to continue their work, and by gratifying their self-realization, they feel satisfaction or happiness in being able to pour their passion in an area they had neglected thus far.

In this way, the added value and participation of middle-aged and elderly women in middle to elderly jobs can act as an intangible capital that can prevent potential social problems and reduce social costs. This social capital can be a potential resource that can influence the activities of individuals or groups.

In other words, once they are in their middle to old age, they start aging in the physical, psychological, and social aspects, which causes a loss in their sense of adaptation in terms of actions and thoughts in new situations. Moreover, if they are neglected in the workplace or do not have a satisfactory job, not only will their identity be lost but their confidence will also decline as their self-esteem decreases; the loss of income lowers their satisfaction throughout their lives.

Therefore, as social activities and economic stability through the participation of elderly work can fulfill the basic needs of middle-aged and elderly women, and plays a role in maintaining their status and self, it can contribute to the lives of middle to old-aged people to be more abundant and for them to have a higher lifestyle satisfaction rate.

Therefore, by looking at the quality of life that can be brought about by the participation of middle-aged and elderly women at work, this study seeks to find ways to improve the life satisfaction of middle-aged and elderly women which are directly related to the developmental task of successful aging in old age.

The purpose of this study is to confirm that participation at work can be a mechanism to change the lives of middle-aged and elderly women, and that it contributes to the potential growth of pursuing health and fairness in the society. By confirming these, it can be an opportunity to increase the importance and value of the work that middle-aged and elderly women want to do.

II. Background Theories

1. Middle-Aged and Elderly Women and Employment

Participation at work as a middle-aged or elderly person not only means that their health supports them to do so, but also that by participating at work, they are freed from the feeling of helplessness caused by a sense of loss, and their health is also maintained by living a well-regulated life. In this sense, the Korean government has provided the elderly with jobs since 2004, but these jobs for the elderly are not just for participating at work but also for helping them economically. As shown in the change of the project name in 2016, the project moves beyond helping their economic activities and encouraging leisure activities on an individual level; rather, it focuses on the middle-aged or elderly person's social integration through social participation and provides jobs that can be compromised as social volunteering within the extent of not being demanding.

Thus, if we look at the advantages and importance of the participation of the middle-aged and elderly at work, it will be as follows: First, as the poverty rate of the elderly in Korea is highest among the OECD countries (Ryu Gun-sik, Kim Dae-hwan, 2011), participating in economic activities in old age can be a means to supplement deficient income. Second, in contrast to their desires, the decline in their physical function means lesser opportunities to work, but the fact that they are participating at work makes them gain satisfaction or usefulness, thereby increasing their self-efficacy. Third, by spending less time at home and instead spending it together with their colleagues or friends, they are able to have a positive self-image as a contributing member of the society, thereby being able to maintain their physical and mental health.

Rowe and Kahn (1998), who advocated successful aging, also showed that the ways to maintain one's mental and physical health in old age include prevention of diseases and disabilities, physical and cognitive activities, and active participation in social activities. Among these, active participation in social activities means participating in productive activities that can restore and give meaning to their relationships with other people. The active participation of the middle-aged and elderly people in social and economic activities is also important in terms of reducing social costs and utilizing elderly manpower.

Based on Thomae's empowerment model (1971), the successful aging theory emphasizes the need to induce the elderly to take responsibility for their own lives in order to lead a satisfying life through the utilization of their skills as economic utility

(as cited in An Hong-soon, 2014).

On the other hand, female participation rate in economic activities in Korea is 50%, which is much lower compared to other OECD countries, but the economic activities of elderly women are comparably higher. Thus, the economic participation rate of Korean women in their 50s is lower than that of the United States or Japan. However, after the age of 65, the participation rate itself is greatly reduced to 30% but is still relatively higher in comparison to developed countries and as the age increases, the gap widens (ILO, 2007). This is an example of poverty in elderly women brought by the lack of retirement preparation and lack of social security system.

In the end, the employment of middle-aged and elderly women is largely concentrated on temporary jobs such as simple labor, sales, and service jobs for them to support their cost of living. Therefore, it is not the subjects' experience of acting in an unstable state with low wage, but rather the limitations in a structurally limited working condition that turn them into passive working objects (Seo Mi-kyung, 2010).

Despite this, employment for middle-aged and elderly women is seen as the most pressing demand in order to prepare for the changes in their midlife and to plan for their later life (Han Kyung-hae, Roh Young-joo, 2000). Employment experience has important implications on an individual, familial, and social level.

Aside from income security, employment for middle-aged and elderly women allows them to be free from psychological alienation and helplessness that they experience at their age. It also allows them to have an increased life satisfaction rate and to have pride by participating in social activities (Kim Dong-bae, Park Eun-young, 2007). On a familial aspect, it can be a basis for economic stability without putting burden on their children through employment, and helps them lead an independent life in old age. This is significant as the utilization of female workers allows the utilization of an idle labor force for economic development and enhancement of national competitiveness in a society with low birth rate and aging population (Seo Mi-kyung, 2010).

In Yoon Hae-gyung's study (2007), it emphasizes the importance of personal growth and self-realization during the turning point in a middle-aged woman's life - the experience of individual maturity and independence, rather than her married life or parental role.

In other words, their commitment to work after the age of 40, that is, entering the labor market and obtaining a sense of value, self-identity, and autonomy are different from men's achievements as it not only means 'I want to earn money' but is also interpreted as 'to establish a new structure of life.'

In this sense, the value of employment among middle-aged and elderly women lies on the enhancement of independence, autonomy, sense of value, and confidence

2. Work Participation and the Quality of Life among Middle-Aged and Elderly Women

The meaning of the quality of life differs according to the perspective of people but it is used in combination with life satisfaction, morale, happiness, positive emotions, well-being, mental well-being, and subjective well-being. Havighurst (1963) defines the quality of life as a subjective assessment of one's life. And as a subjective assessment of how satisfied one is with their life, the quality of life is defined as an individual's subjective assessment of either their materialistic or psychological life goals or needs attainment.

Therefore, individuals feel satisfied when what they want matches their actual life (Albert & Teresi, 2001). The quality of life is a multidimensional concept that is very comprehensive and includes various aspects such as life satisfaction, internal satisfaction, happiness, and positive emotions. Therefore, in order to understand the quality of life in middle and old age, it should be approached from various aspects such as physical, psychological, social, economic, and environment.

The reason why we are discussing the quality of life in old age is that by 2018, 14.3% of the total population will be older than 65 years old (Korea National Statistics Office, 2014) and that old age is now extended to 30-40 years compared to the past, so there is increased interest in the life of the elderly. The extension in old age means extension in the period in which middle-aged and elderly women can work and serve in the society.

However, as middle-aged and old-aged people progress in the aging process, their body's ability to control each organ is reduced, the body can no longer cope extensively with external stimuli, and the body's immune system fails, resulting in various changes in the physical aspect. Also, as the habits they have carried with them so far and as their environments change, they may have difficulties in social adaptation or may become frustrated.

In addition, they may feel inferior as their economic power is lowered, and their dependency may increase as the decreased function of their mind and body reduces activity, thereby losing their autonomy. They may face early or honorary retirement at work as they are overpowered by the younger generation who are nimble in terms of new technologies and information.

Nevertheless, middle-aged and elderly people who participate at work or volunteer activities can be said to have a relatively healthy and diverse personal desires in comparison to those who do not. In this way, the sustainability of employment for middle-aged and elderly women is a basic condition for guaranteeing the quality of life through income, and employment is one way to secure these basic conditions (Park Seon-dok et al. 2015).

Thus, aside from the purpose of livelihood maintenance, economic activity in old age through employment allows people to have a higher sense of self-fulfillment, morale and satisfaction in life, self-esteem, and self-efficacy through health maintenance and recreational activities than retirees.

In this way, the economic activities of middle-aged and elderly women can become an opportunity to overcome the dysfunction caused by the loss of roles which represent old age, and can consequently form a social relationship or a positive relationship through social integration. Through these relationships, their quality of life can be improved.

III. Conclusion and suggestion

Many studies have shown that the quality of life is higher when people are living in a healthy and independent life, and that social activities including volunteering and economic activities that utilize recreational activities increase the life satisfaction among middle-aged and elderly women.

Given the above theoretical background, the following are some suggestions for enhancing the meaning of work which positively affects the quality of life among middle-aged and elderly women.

First, it was found that the participation of middle-aged and elderly women at work plays an important role in the quality of their life. Although the concept of the quality of life for the elderly is very comprehensive, it can be expressed as a positive state in which they can gain happiness from daily activities and have a meaningful acceptance of their life. It then follows the meaningful fact that middle-aged and elderly women consider life meaningful through their participation at work. Thus, through the social activity that is work, the standard for behavior is created in terms of judgement, evaluation, and action. In terms of providing an opportunity for social participation, it must be emphasized that the importance of participation at work for middle-aged and elderly women in each period is not 'to earn living expenses,' but must be recognized as an opportunity to develop their own life instead.

Second, the four pains we regard as the problem of middle-aged and old-aged people include poverty, illness, alienation, and loss of role. Therefore, the best way to solve all these difficulties is to provide jobs for middle-aged and elderly people. This is because it provides them opportunities to personally supplement their latter life through their participation at work; to contribute to their health through a well-regulated life; to be free from idly spending 24 hours a day; and to be provided with an opportunity to acquire a unique role in order to escape the social deviation called retirement. On a national scale, it is possible to solve the problems of the

middle-aged and elderly by using the idle workforce that comes from aging, and to develop social competencies through productive activities. Thus, it can be said that providing jobs to middle-aged and elderly people can have the effect of killing two birds with one stone.

Third, if the middle-aged and elderly women's participation at work has such an important meaning, then the government's elderly job project should be led by reexamining the extended old age and creating employment policies for the elderly. Thus, there is a need for a customized employment policy and program that can encourage the employment of middle-aged and elderly women, including the prohibition of unfair dismissal according to sex and age, development of occupations for the employment of middle-aged and elderly women, education and training for employment support, wage assistance, re-employment consultation, job introduction, and so on.

Fourth, the effects that middle-aged and elderly women receive when participating at work are significant, but in reality, it is extremely difficult for women to earn income by entering the labor market. In the case of middle-aged and elderly women, it is more difficult for them to get a job in comparison to men from the same age group, and even if they did get a job, they are reluctant to participate because of the relatively low wages.

Therefore, the social service sector which is experiencing a steady increase in popular demand should focus on creating policies for expanding employment opportunities for middle-aged and elderly women, or build a system that can allow them to easily access jobs. For example, in the women's job creation project such as the 'child care business' currently implemented by the government, it becomes a good job as it provides results that can be added to the home economy. Thus, it becomes a win-win situation for both parents and children, as the grandmother who cares for her grandchild can make a living, the child can be raised with warm love by this grandmother, and the grandmother can receive wage along with happiness in caring for the child.

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