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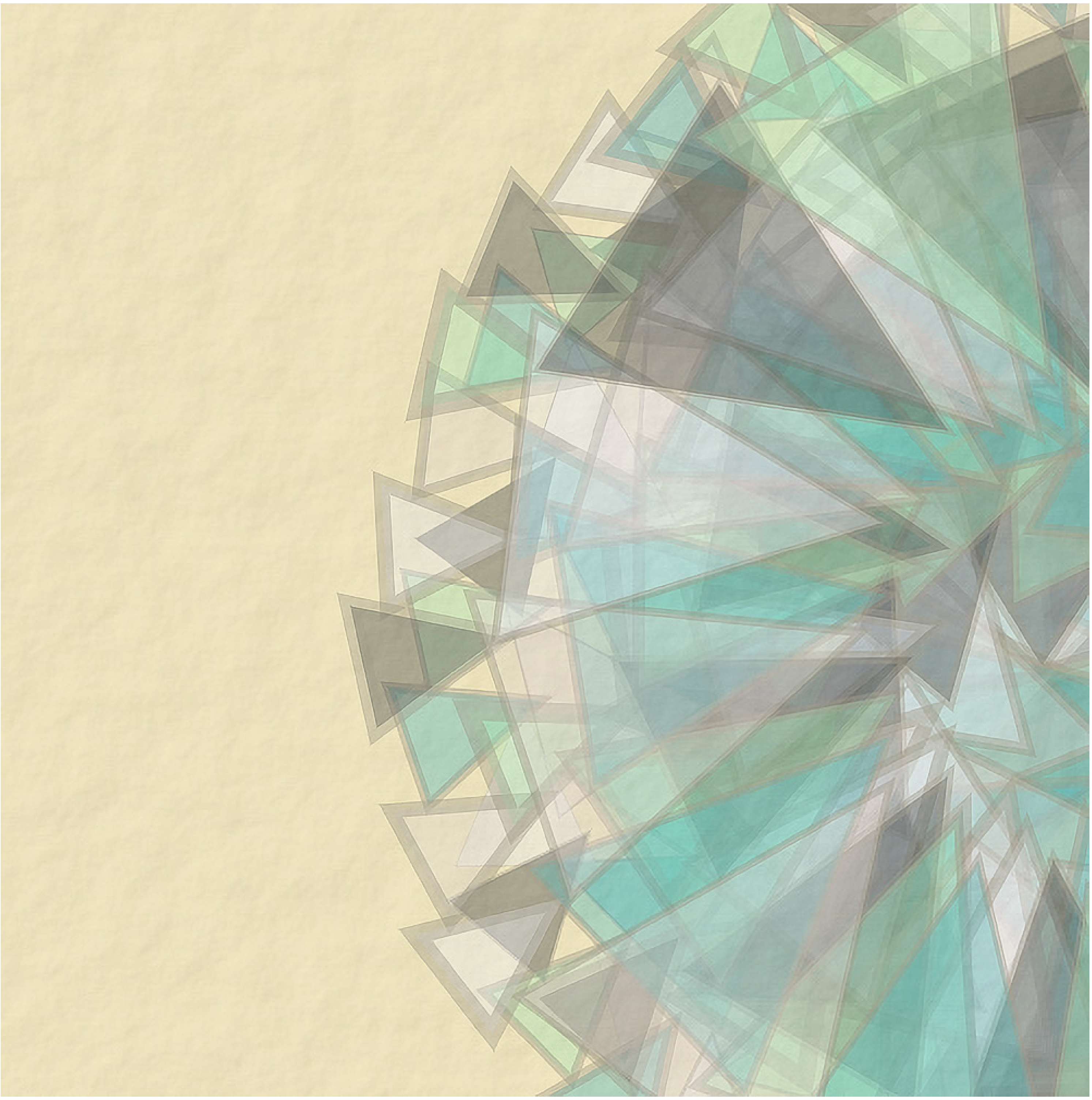

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I. Editor’s Preface

Jiro Senda
Chief Editor, GRM Journal
Professor, Graduate School of Science and Engineering, Doshisha University

The 8th volume of Global Resource Management (GRM) journal is published here. I would like to express my gratitude and appreciation to all who participated in this journal. We warmly welcome to open this journal to wider concerned reader.

We are still facing COVID19 virus in a couple of years. Meanwhile, we are unlikely to meet the decarbonization trend due to global warming. And the world is accelerating into circular carbon economy. Now, Carbon Neutral, Green Innovation, Renewable Energy, Carbon Free Fuel, Energy Saving are the latest keywords. Then, moving toward much more sustainable urban structure and transportation system are really great challenge based on the sustainable resources and energies. There are not easy, but we have to survive this huge barrier for our sustainable future life in all countries.

This involved perspective is directly related to our GRM program. Here, we should propose the concept of integrated solutions for cost-effective decarbonization and gave examples where major gains can be achieved using existing technologies to realize global energy sustainability with minimal carbon footprint at scale, for both short and long term.

Thus, Holonic Energy path , which is a scheme of best mix between hard energy and soft energy related to right energy in right place, and local energy generation for local energy consumption procedure are the kind of promising candidate to build up the optimum energy infrastructure in both developed countries and developing areas.

I expect that GRM activity will provide a good opportunity to consider deeply global theme connected with resources and energies.

An Interdisciplinary Course

Samar K Guharay
Visiting Professor AY 2017, Doshisha University

Under the Doshisha Global Resource Management (GRM), a five-week long condensed course around the general theme of Recent Trends in Infrastructure Engineering was executed in the fall 2017 semester. The key objective was to build an academic platform drawing in students from both Natural and Social Sciences and Engineering. The outcomes of this academic endeavor were: (a) students from both Natural and Social Sciences and Engineering participated in this course; (b) they took common lessons together, and (c) they worked collaboratively on several project topics.

This issue of the GRM journal includes articles by some of the students who could be reached by the GRM administration. These articles illustrate the outcomes of the new interdisciplinary course at Doshisha University. With this foundational work spearheaded by the GRM program, related academic activities elsewhere can be leveraged through broad collaborations - complementary academic agenda and opportunities for hands-on pursuits in industries can form the key goals. Such integrated educational endeavors have merits to strengthen academic programs towards building skilled workforces, and this in turn renders sustainable and measurable socio-economic impacts.

Fall 2017 Class of "Recent Trends in Infrastructure Engineering"

Motoi Wada
Graduate School of Science and Engineering, Doshisha University

The course "Recent Trends in Infrastructure Engineering" was designed as a new experimental initiative toward an education merging quantitative data handling in science and engineering field and practical methodology studies employed in social science majors. Doshisha invited Dr. Samar Guharay in 2017 fall semester, as the instructor to lead this course as one of the important subjects of the GRM education program. With experiences over more than four decades in both academia and research organizations (and some experience of leading research and development activities in an industry as well) Dr. Guharay agreed to open his class based on the following perspectives.

In this ever-changing world, especially with rapidly advancing industrialization, humans continue synchronizing with the dynamics of the changes and adapt to environments. The mechanism for adaptiveness can possibly reflect on the basic Darwinian formalism, *i.e.*, survivability of the fittest. Questions pertaining to equitable utilization of resources and operational mechanisms for removing barriers for global homogeneity can shed light on forming an ideal inclusive society. If harnessed well and recognized early enough, departures from the ideal characteristics can be attributed to signatures for stress or instabilities. An example of a characteristic signature can be trends in the Gini index observations of increasing values (toward 1) may hint on departures of overall inclusiveness in the society, even with industrial advancements. This leaves us with questions pertaining to causalities and associated challenges.

With the above premises the course introduced students the progress of the society over times and also key developments in natural sciences and engineering. Since human behavior and expressions can be sensitive to different stimuli, both at the individual and ensemble levels, this course attempted to discuss the problem from the standpoint of causalities. Some basic modeling and simulation (M&S) concepts were introduced. To identify either linkages or disconnects studies of network-based approaches formed the foundation of the modeling framework. The M&S studies discussed on methodologies for sensitivity analyses of different parameters. This led towards architecting decision support machineries constrained by resources. Towards this end, Pareto analysis was briefly introduced to evaluate any "artificial" scarcity of resources. Learning through both real-life and synthetic data help build insights into the problems; these lessons directly help building policies to intervene and make appropriate adjustments for a more equitable society. Understanding correlations between natural and social sciences, especially in the context of catastrophic natural or human-induced events, was attempted, for example, impact due to extreme weather, earthquakes, nuclear disaster, and above all, resource utilizations to maintain a balanced eco-system.

The class was quite interactive; students from both natural and social science fields debated well on problems related to both academic fields. Having diverse academic background, they exchanged opinions freely under the guidance of Dr. Guharay. Dr. Guharay made the following general remarks after he finished his class and exchanged opinions with the GRM program faculties. Designing agile course curricula, building implementation processes, defining metrics for successful executions, and above all, ensuring sustainability have drawn attention among the academic communities as well as sponsoring agencies. The GRM program at Doshisha University has been steadily spearheading in this area. With GRM's significant foundational work it will be important to keep close attention to related activities elsewhere and build a mechanism to leverage through broad collaborations. Linkages of the academic programs with industries will foster steady engagements of students and rapid insertions of academic knowledge toward applications.

The two papers in this issue were contributed by the former GRM students who took the class of "Recent Trends in Infrastructure Engineering" in fall semester 2017. They looked back the topic they worked during the class four years ago, added some recent data and updated the contents to strengthen discussions. These two papers were prepared as original works for this issue. The readers may find the papers are written from both perspectives, namely, social sciences as well as natural sciences and engineering. The spirit of the GRM educational program will be bolstered by the authors and other students who participated in the program.

Analysis of China's Societal Evolution in the Last Four Decades

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Abstract
China's rapid economic growth within the last 40 years has significantly reduced some key socio-economic concerns, specifically extreme poverty of a large section of the vast population. In this context, changes in China's economic equality and human development are discussed. To pinpoint trends in China's societal evolution, social indicators such as the Gini Coefficient, Human Development Index, and Economic Freedom Index in the last four decades are examined. Despite the implementation of strategic policies leading to significant market growth, increased human development, and marginal improvements in economic freedom, wealth disparity remains large.

Keywords: Gini Coefficient, Human Development Index, Economic Freedom Index, Social Evolution

I. Introduction

By the end of China's Great Proletarian Cultural Revolution, an overwhelming majority of the more than 900 million people was surviving on less than two dollars per day. To solve this problem, China adopted several policies and reforms to attract more foreign investments, achieve economic growth, and raise national income. One key policy involves the promotion of a socialist market economy from 1978. As a result, from 1980 to 2007, China became the fastest growing economy at an average annual GDP growth rate of about 10%. [1] From 90%, the poverty rate went down to below 3% after 2013. [2] Fundamental reforms in the rural sector were instrumental in increasing the agriculture sector output to several-fold which accelerated the decline in poverty.

Despite all the achievements leading to an assured economic growth, one key issue that is often overlooked is the effect of China's socio-economic policies on the country's social equality. This includes equal opportunity for all without regards for individual distinctions in race, ethnicity, gender, age, social class, sexual orientation or other characteristics, or circumstances. Within the optics of inclusive growth, it is important to determine whether China's economic growth positively affects all demographics in a population.

This study explores China's societal evolution within the last 40 years. Some contents included in this study are products of project work conducted for a new graduate course, Recent Trends in Infrastructure Engineering, at Doshisha University in the fall of 2017. The succeeding analysis explores the question: did socio-economic rights and equality prosper with economic growth? Social indicators are examined and compared. The Gini Coefficient is used to determine the level of income inequality. The Human Development Index (HDI) is used to inspect human achievements in some identified key dimensions. The Economic Freedom Index measures economic liberty. A basic trendline fit is applied to elucidate general temporal dynamic behaviors of the chosen indicators.

II. Gini Coefficient

Figure 1 shows China's yearly Gini Coefficient extracted from Ravallion and Chen for the period 1981 to 2001 [3] and the National Bureau of Statistics (NBS) of China from 2003 to 2019. The Gini Coefficient shows the level of spread of income distribution and, consequently, reflects the degree of income inequality in a population. The coefficient is obtained from the comparison between the graph of the income distribution with respect to population percentile by income (the so-called Lorenz curve) and to that of a perfect income distribution. The coefficient value ranges between zero and one. The closer the value is to zero, the closer a population is to having a perfect income equality, i.e., an egalitarian society.

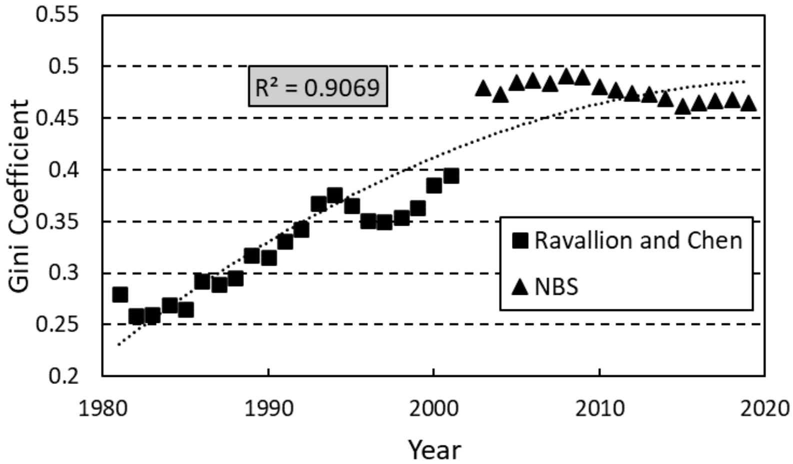

Figure 1. China's Gini Coefficient from 1981 to 2019.

Figure 1 depicts a growing income inequality over time. China's Gini Coefficient started at around 0.28 in 1981 and remained below 0.3 until 1988 but continued to increase and peaked just a little below 0.5 in 2010. Since then, China's Gini Coefficient remained above 0.45 until 2019. Linear regression is a simple tool used to fit a predictive model of some socio-economic indicators. A simple linear fit may be used to determine the overall behavior of some indices which may provide a general sense of in which direction the trend may be headed. An R-squared, R^2, value represents the goodness-of-fit for a linear regression model. A high R^2 value may indicate that the fitted model closely corresponds to the trend of the observed data set. However, it is important to identify when a model starts to overfit and begins to consider outlier points as part of the trend. For the given set of Gini Coefficients, a second order polynomial trendline fit over the available data points provides an R^2 value of 0.907. Using this concave fit may indicate that the income inequality is generally increasing and will reach a maximum value, possibly in 2008, and is then followed by a general downtrend in the succeeding decades. It can be noted that the global economic growth started to slow down in 2008. Looking at the 40-year data, in general the trend shows a dramatic rise in wealth inequality, especially in the first half, marked by short periods of downward trend between 1981–1983, 1994–1997, and 2010–2016.

In 1980, 95% of the rural population lived below the poverty line. [2] In the same year, it is estimated that 80% of the population still lived in rural areas. [4] While it is true that the bulk of poverty was reduced in the rural areas, it did not have a lasting and significant effect in reducing the wealth inequality. The same economic growth further enriched the wealthy population. This disparity and China's strict household registration system have created social stratification that makes the rural population, where most low-income households are based, marginalized compared to the urban population. The disparity has left them with the least amount of social resources and protection. To escape poverty, an increasing number of young people are abandoning the rural areas to work in the cities creating a unique phenomenon of local migration. From official China statistics, in 2011, the Chinese urban resident population ballooned to 691 million people surpassing half of the total population, the first time it has ever been recorded. [5], [6] The exodus of the capable laborers from the countryside has been a growing concern as it may lead to rural deterioration and a decline in agricultural production. Houses in the rural areas have been left empty and are either collapsing or being systematically demolished. This leaves mostly the elderly, children, and women with little help leading to worsening rural demographic structure.

III. Human Development Index

The Human Development Index (HDI), introduced only in 1990, is one of the social indicators devised to quantify human growth by measuring how people are performing in certain key dimensions of life. [7] It is based on an individual's longevity (life expectancy), education (schooling years), and income (gross national income or GNI). Taking the normalized indices of each component, the geometric mean of the three represents the HDI.

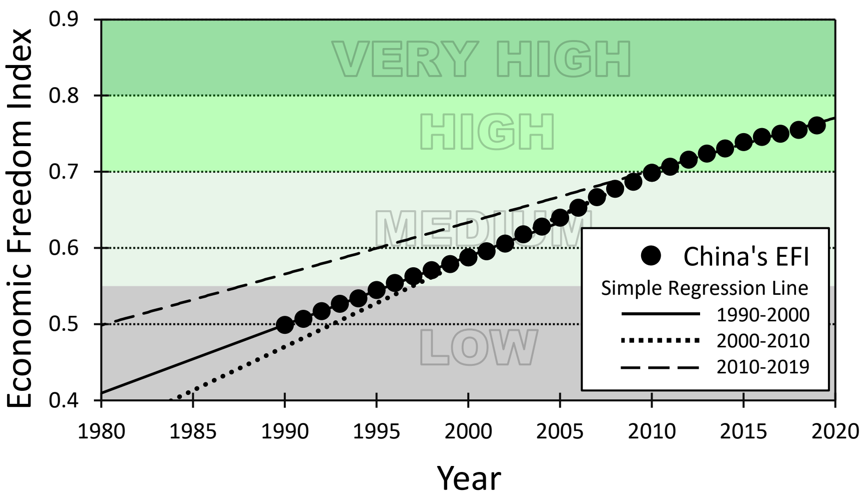

Figure 2. China's Human Development Index from 1990 to 2019 with fitted linear trendline.

Figure 2 shows China's HDI from 1990 to 2019. Over the period covered, it is evident that year after year, the index increased. Starting at the low range below 0.55 in the 1990s, the index consistently improved and reached well within the high index range in the most recent decade. A simple linear trendline fit for each decade is drawn to quickly show the rate per decade. It can be observed that the last decade marked a slower growth which is an expected behavior as it plateaus in the “very high” range assuming sustained growth. Based on its current HDI, China is categorized as having high human development and ranks among the top half in the world. A look into the three indices, Life Expectancy, Education, and Income in Figures 3, 4, and 5, respectively, shows how these components affect HDI. The indices are plotted against the same vertical axis range to show key differences in their behavior over time.

A. Life Expectancy Index

While China’s life expectancy has more than doubled in the last century, it echoes the general increased longevity around world due to global improvements in healthcare, sanitation, education, and income. China surpassed the world index from 1970 and currently ranks 51st in the world with a life expectancy of around 77 years. Figure 3 shows the Life Expectancy Index of China from 1990 to 2019. The current trend shows an overall increase of 0.12 which corresponds to an additional seven more healthy years compared to the national average in 1990. Checking against the United Nation’s Millennium Development Goal, China was able to reduce child mortality by two-thirds and improve maternal health both leading to the continued increase in life expectancy.

China may see a further increase in life expectancy if it tackles issues with air quality which has become a major health concern in the region. Poor air quality especially in densely populated cities still exists today. With a growing economy that is fueled by endless expansions of the manufacturing industry coupled with rapid urbanizations, a large part of the working population is forced to live in smog-filled metropolises. In fact, since the turn of the century, it has been estimated that as many as 30 million premature deaths were caused by breathing polluted air. [8]

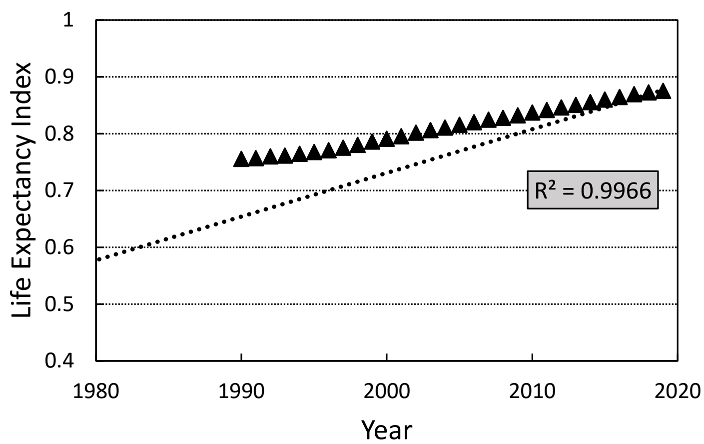

Figure 3. China’s Life Expectancy Index from 1990 to 2019 with fitted linear trendline.

B. Education Index

The Education Index is derived from the geometric mean of the expected number of years of schooling and the mean schooling years. The former is the number of years a student is expected to go to school while the latter is the average number of years of education that actual students over the age of 25 have completed.

For the same period, the Education Index rose to 0.657 from 0.405. On average, Chinese people over 25 today have attended five more years of education (from 8.8 years of education to 14 years of education), while students are expected to receive three more years of education compared to three decades ago (from 4.8 years of education to 8.1 years of education). A rise in the total Education Index is largely due to the enforcement of a free nine-year compulsory education which started in 1986.

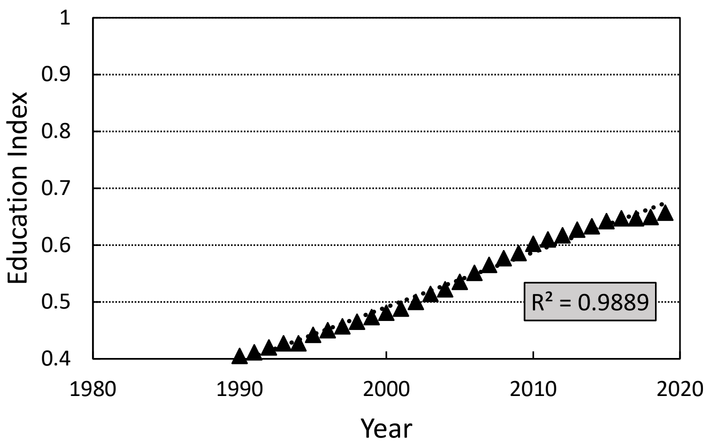

Figure 4. China's Education Index from 1990 to 2019 with fitted linear trendline.

C. Income Index

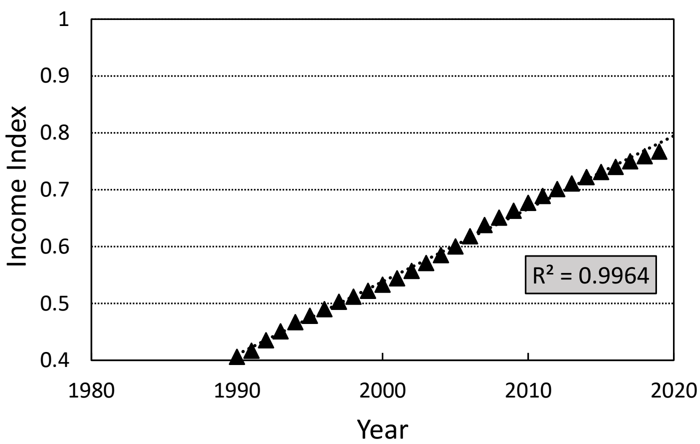

Figure 5. China's Income Index from 1990 to 2019 with fitted linear trendline.

The Income Index is the third component of HDI and provides the standard of living dimension of human development. It is derived from the gross national income per capita based on purchasing power parity. Figure 4 shows the Income Index of China over the same period. The index started just above 0.4 in 1990 and consistently increased to its present number at 0.767. Like the two indices, life expectancy and education, China's Income Index follows a linear uptrend. Since the Income Index is based on the average income of the population, the index shows the income growth of the country and does not distinguish any income inequality. Thus, the increase in Income Index only points to the overall economic growth of the nation. In fact, China's slowed economic growth around 2000 and after 2015 is evident in the slight deviation of the points from the linear model.

While the Education and Income Indices started at around the same level in the 1990s, the Income Index recorded a higher rate of increase over the 30-year period. Based on the applied linear fit, the Life Expectancy Index increases at a rate of 0.44% while the Education Index and the Income Index are increasing at 0.96% and 1.28%, respectively. It is expected that the Life Expectancy Index would have a slower increase because it is already relatively high. The maximum age is set at 85-years old.

IV. Economic Freedom Index

The Economic Freedom Index measures the degree of government control of economic activities. Its value ranges from 0 to 100 and is derived from scores of four broad categories, namely, rule of law, government size, regulatory efficiency, and market openness. It has been reported that economic freedom has a positive effect on income inequality but is attenuated by the presence of democratic regimes. [9] Figure 6 shows China's Economic Freedom Index from 1995 to 2020. For this period, based on the designated levels of index values, China falls within the mostly unfree (index between 50 to 60) countries group and ranks 103rd globally. The marked increase, albeit modest, has been a result of legislating the property law, easing control of state-owned enterprises, and easing procedures of opening and closing businesses.

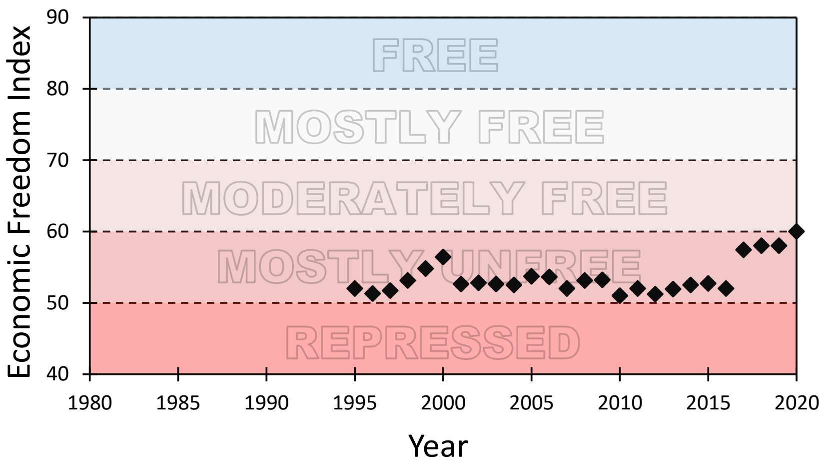

Figure 6. China's Economic Freedom Index from 1995 to 2020.

V. Gini Coefficient vs HDI

The growth in China's HDI within the considered period does not reflect the rise in wealth disparity expressed by the time series Gini Coefficient mainly because the HDI is not designed to account for the imbalance in growth among various demographics. The classic case of the rich getting richer and the poor getting poorer is reflected in the way the Gini Coefficient remained in the high range over the last two decades despite an era of social, political, and economic reforms.

In 2010, the Inequality-Adjusted Human Development Index (IHDI) in the Human Development Report of the United Nations Development Program (UNDP) was reported to incorporate the actual growth distribution, showing the effects of inequalities, of the same key aspects in human development over the entire population. [10] This index discounts the losses to growth due to inequalities. The more severe the level of inequality is, the higher the cost for the HDI. It was reported that in 2010 China's IHDI is at 0.538 which is 23% lower than the HDI that year. In 2019, the IHDI rose to 0.639, 16% lower than the HDI that year which is at 0.761. Considering these adjustments, according to the UNDP report, from 2010 China moved from an IHDI level of medium human development to very high human development in 2019. It is evident that despite China's overall continuous improvement of human development, the wealth inequality has worsened. Being the second largest economy in the world, it ranks only at 67 among countries with high IHD.

VI. Conclusion

Social indicators such as the Gini Coefficient, Human Development Index, and Economic Freedom Index of China in the last four decades were examined and compared. The trend shows that socio-economic reforms have triggered economic growth and progress in human development over the last four-decade period. Trendline fits suggest continuous improvements in average health, education, and income. However, the same reforms provided little option for the people, especially from the low-income population, to take economic actions which may have caused a further wealth gap. While the income gap still pervades, China's Gini Coefficient in recent years has gradually reduced and shows signs of flattening.

Acknowledgement

This paper originates from a project report submitted by the author for the 2017 Fall GRM course taught by Professor Samar K. Guharay.

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Macro-level Data, Human Development, and Inclusive Growth

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Abstract
Human development has been an issue of concern for development workers and academia. Each year, aid industry pours billions of rupees into human development and numerous reports are produced on this theme. Human development has been represented by macro-level data such as GDP and GNP. Such data do not represent the ground reality of the concerned countries or the people. They do not tell us about inclusive growth. Informal workers, women, and people from marginalized sections of society are not represented by such data. That is because most of the informal workers are invisible to authorities. There is no record of them. In countries like Nepal 90% of the women participate in the informal economy. Moreover, some South Asian countries including Nepal do not consist of a homogenous group. The role and status of women vary depending on their ethnicity, caste, age, level of education, and geography.

Keywords: *human development, numerical data*

I. Introduction

Human development is a contested issue in academia and among development workers. Ever since the first Human Development Report (HDR) was released by the UNDP in 1990 (UNDP 1990) many such reports have been published as of today. The main objective of the literature surrounding human development and organizations involved in the activities of human development is to improve the living conditions of people. The major thrust of human development has been on inclusive growth, by bringing the deprived sections of society into the mainstream of development. Numerous international, national, and local-level aid organizations have been working across the world to achieve the goal of human development with inclusive growth as the slogan. This work attempts to argue how the portrait of human development through macro data among the clusters of countries labelled as developed and developing is flawed and that the human development portrayed by such data does not address inclusive growth. It then suggests that inclusive growth can be achieved by addressing the issue of multi-dimensional poverty. It does so by making a comparison among the developing countries of Nepal, Lebanon, the Philippines, and the United States of America as the developed country. Macro data are obtained from related homepages of the World Bank (The World Bank n.d.). A gender specific case of Nepal is also presented to show how national level macro data utterly fail to capture the spirit of inclusive growth.

II. Comparison with other countries

A. Fundamental data

Each year the aid industry spends billions on projects and activities aimed at human development with the motto of inclusive growth. However, no significant progress has been achieved. There is a huge gap in the living standard of people in the developed and developing countries. The notion of developed and developing countries is strong among economists and development practitioners. Other terms popular to denote these two categories are the North and the South.

Besides the inequality between the developed and developing countries, a huge inequality exists among the people in the wealthiest nation, the United States of America as 580,466 people were homeless in the year 2020 (National Alliance to End Homelessness n.d.). On the other hand, what makes the comparative study among Nepal, Lebanon, and the Philippines interesting is that there are a number of similarities and differences among these geographically distant and demographically individual countries. The basic data are summarized in Table 1.

Table 1. Comparison among Nepal, Lebanon, the Philippines, and the USA.

Country	Nepal	Lebanon	Philippines	US
Area (km^2)	147,181	10, 452	301, 780	9,826,675
Population density (p/km^2)	202	587	347	35
GDP per capita (USD/p)				
2005	316	4,575	1,244	44,115
2010	593	7,761	2,217	48,467
2015	901	7,664	3,001	56,863
2020	1,155	4,649	3,298	63,414
Growth GDP per capita (%)				
2005	7.6	0.4	3.2	4.3
2010	18	6.1	16	2.0
2015	10	-0	7.1	3.5
2020	5.6	-7.9	2.0	2.3

As shown by the table, the countries have differences in geographical size. Lebanon is the smallest compared to Nepal and the Philippines, and Nepal is half the size of the Philippines. All listed developing countries appear very small compared to the United States of America, which is the third largest globally in terms of surface area. It also has the largest economy of the world and falls under the category of a developed country unlike the other three developing countries. The unequal demographic distribution and population density between Nepal, Lebanon, the Philippines, and the US is staggering. Compared to other countries, Lebanon specifically faces the burden of managing a high density of population (587 people per square kilometer) with the refugee crisis in neighboring Syria. The population density of Nepal is lower than that of Lebanon given its size. The reason for this is geographical. Fifteen percent of the total land in Nepal comprises the Himalayas dominated by snowcapped mountains including Mount Everest, where the population is sparse. Similarly, the population is also scattered across 68% of the country comprised of hills and valleys. As such the population is concentrated in the southern plain belt, which accounts for 15% of the total land.

Lebanon, in particular, witnessed a sharp decline in the annual GDP growth rate from more than 10% in 2010 to about 0% in 2015. The country registered an average annual real GDP growth of 4% between 2006 and 2015. To explain this, one should go to historical events as will be explained shortly. As for Nepal, its GDP per capita growth rate shows a slight increase after 2005. This is because Nepal witnessed the end of a decade long Maoist insurgency in 2006. GDP per capita of the Philippines in 2013 was very much affected by the biggest typhoon, Hayan, which caused thousands of casualties leaving many homeless.

The year 2006 was the year of the 33-day war with Israel that damaged infrastructure and other properties of Lebanon. However, due to international aid the country was quickly reconstructed and it registered a healthy real GDP growth trend until 2011. In March 2011, the Arab Spring started from Syria leading to the displacement of two million registered and unregistered refugees, explaining the 0.82 real GDP growth rate of 2015 due to the challenge of hosting a massive population on a small land area of 10,542 square kilometers.

B. Access to electricity

Figure 1 shows the percentage of the population that has access to electricity. In the cases of Nepal and the Philippines, there is a steady rise of the population that has access to the electricity post 1996. Nepal witnessed restoration of democracy after the mass revolution against the one-party *Panchayat* regime in 1990. The country adopted liberal economic policies opening the door for foreign investment. More hydro power projects were developed. Yet, power supply remained erratic between 1996 to 2006. This is the period of the Maoist insurgency and the state was not strong enough to monitor, expand, and regulate the energy sector. The state of access to electricity of the USA and that of Lebanon is saturated at 100%. In the case of Philippines there has been a steady growth of electricity. However just like in Nepal, still a large number of the rural populace in Philippines continues to be deprived of electricity facility. (Taniguchi 2019)

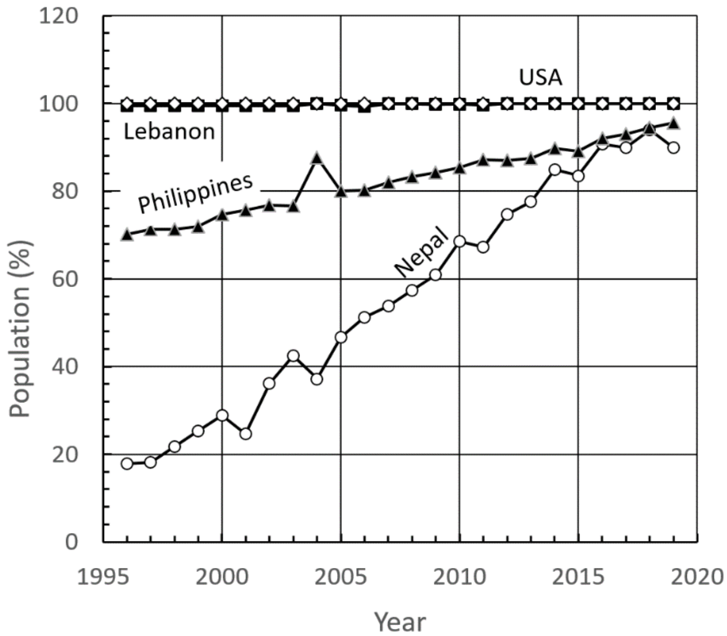

Figure 1. Access to electricity for citizens in the USA, Lebanon, Nepal, and the Philippines.

III. Case of Nepal

Having compared three developing countries and one advanced country with the help of a few macro-level data above, we now turn to a country specific case – that of Nepal – and try to show how the representation by such data can be misleading. The section below looks at a few macro-level data of Nepal and goes on to argue how the data fail to address the highly uneven gender situation of the South Asian country. Nepal is a small hilly country between China and India with a total area of 147,181 square kilometers. Its population as per the Population and Housing Census Report 2011 is 26,494,504 (Government of Nepal, Central Bureau of Statistics 2012). Women make up 50% of the total population. As like other South Asian countries, Nepalese society is patriarchal. We now look at various indicators of Nepal and Nepalese women.

Nepal's GDP was on a constant rise from the year 1960 to 2020 with some slackening until the year 2014, but picked up towards 2020 as shown in Figure 2. That means the country's economic health is improving, enabling the government to spend on development activities. However, one should note that GDP per capita did not increase as remarkably as GDP as indicated in Figure 2. This may be attributable to the unequal distribution of resources across the country due to lack of sound infrastructure (delivery mechanism), transparency, and skilled human resources in executing development programs.

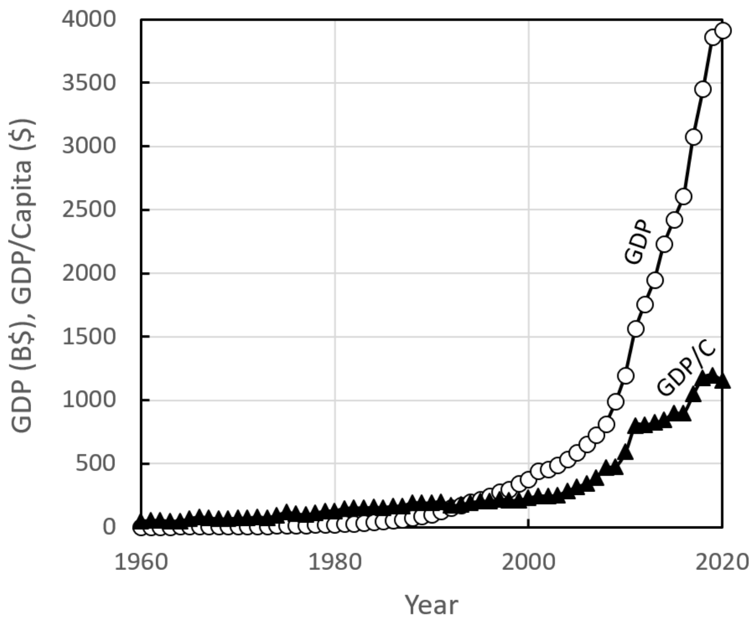

Figure 2. GDP and GDP per capita of Nepal from 1960 to 2020.

Now, we look at another economic indicator to assess the economic health of the country; that is, grants excluding technical cooperation over the years. Nepal has been a recipient country of technical and non-technical grants. Non-technical grants increased significantly towards 2009 and fell back but rose after 2014. In the year 2015, an earthquake measuring 7.5 on the Richter scale struck Nepal. It caused around 9,000 deaths, destroying property worth millions. Instantly, the country also received pledges of foreign aid. Having examined the economic health of the country, we now examine the situation of education at the primary level in Nepal compared to the male and female population in Figure 3.

Figure 3 shows the gross enrollment of male/female students at the primary level. According to the World Health Organization (World Health Organization n.d.), the primary school enrolment rate is defined as follows: "Number of children of official primary school age who are enrolled in primary education as a

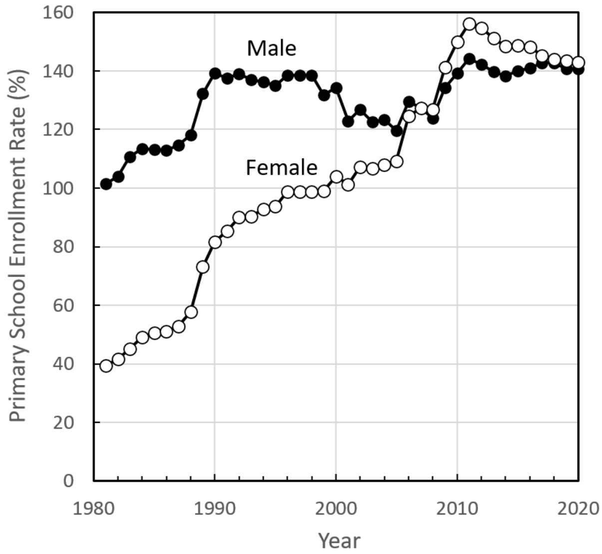

Figure 3. Primary school enrollment rate in Nepal.

percentage of the total children of the official school age population." In the case of USA, the rate is very close to 100% since almost all children of the corresponding age go to school. Comparing the two graph lines we find that the gross enrollment rate of girls is higher than that of the boys at the primary level. The higher rate may seem to indicate better educational opportunities for female students, but one should be careful while interpreting the data. Children of the requisite age enroll in school, but they cannot attend the classes. They take extra years to finish school to increase the enrollment rate.

We now look at people's access to improved drinking water sources. According to a recent survey, a household spends about 150 minutes to collect water in remote mountain villages in Nepal (Satoru Komatsu 2019). The access to drinking water is an important indicator to understand the work hours of women in a developing country. Mostly, women in developing countries spend hours on ensuring a supply of drinking

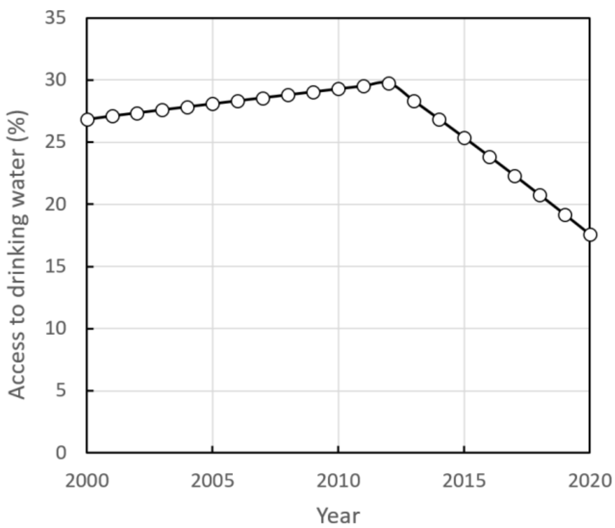

Figure 4. People in Nepal using safely managed drinking water services (% of population).

water. Improved water sources mean either hand pumped water instead of wells or piped water that flows near the house. That way, women can save a lot of time and they are also relieved of the drudgery of collecting water for family consumption and for domestic animals or household use.

Figure 3 shows that the primary school enrollment for girls is higher. However, the reality is that with the increase in the level of education, the dropout rate for girls is higher. Ultimately, very few girls make it to the post-graduate level compared to the boys. Son preference is strong in Nepalese society. Therefore, parents invest in the education of sons by enrolling them in private schools, where the quality of education is better compared to the community schools in which most of the girls in Nepal are enrolled. Also, generalizing the situation of women in Nepal is a grave mistake as they do not consist of a homogenous group. The diversity of Nepalese women is characterized by geography, ethnicity, caste, religion, age, education background, and poverty. Therefore, macro-level data do not tell the ground reality of all Nepalese women. Such data is more likely to exclude Dalit and women from marginalized communities.

IV. Discussion

Macro-level data of countries across the world do not provide us with an accurate picture of human development. Each country has its specific traits and needs for human development. We saw that Lebanon, though a small country, has the highest population density compared to other countries. Also, other indicators like the GDP growth rate and access to electricity are not commensurate with the size of a country or with the status of a country being developed or developing. For example, the GDP growth rate of the USA is slower compared to that of other countries. It also means that one type of facility in a country may have wider coverage compared to that of others. With the country-specific case of Nepal, we also saw how macro data fails to capture the situation of Nepalese women. Another crucial point to note is that a huge number of people in the third world countries participate in various informal sectors of the economy as street vendors, domestic workers, and daily wage earners, among others. In the case of Nepal, about 90% of Nepalese women participate in the informal economy (Central Bureau of Statistics, Nepal 2019, 29). The majority of informal works remain invisible and macro data hardly reveal them.

In addition, regarding macro data such as GDP and GNP that focus on the economic well-being of a society or a country, scholars suggest approaching human development from a capability perspective. However, the capability perspective is less realistic as it emphasizes free will, which is difficult to predict and measure. The confusion is, if a community chooses not to use the facilities provided by modern technology and leads a life of hardship, cut off from the globalized world, would that be exercising capability or the lack of human development? The notion of inclusive growth is now gaining popularity as an alternative to the macro level data on human development. There is no universal definition of inclusive growth. Inclusive growth has been favored for its attributes such as the emphasis on high-paced economic growth that is sustainable and is geared towards employment generation and poverty reduction. Another attribute attached to inclusive growth is that it focuses not only on the growth of firms, but also individuals (Gable 2011, 384). Another thrust of inclusive growth is absolute reduction of poverty, which gives great hope for human development in the true sense (Alexander 2015, 1). While the aspect of inclusive growth that considers the individual is praiseworthy, the government merely acting as a facilitator for the players of the market in the name of a speedy growth rate is suspicious. Inclusive growth must strike a balance between the players of the market and the common public who could be exploited by corporate giants.

Poverty is multidimensional. A multidimensional study approach to poverty seeks to understand and address poverty by incorporating all aspects such as economic well-being, capability, political inclusion, and civic/cultural inclusion, among others. HDR being released by the UN has undergone a huge change since it was released for the first time in 1990. The report presents the status of human development of a country by covering the dimensions of health, education, and income. In 2010, the UN introduced the Inequality Adjusted Human Development Index (IHDI) to incorporate the distribution aspect of the aforementioned dimensions (H.H. Suryanarayana 2016). The report has been evolving in its attempt to be more inclusive and present more accurate states of human development. It has also been incorporating the Multidimensional Poverty Index (MPI) to address the state of deprivation among those three dimensions through 10 indicators such as child mortality, years of schooling, enrolment, water, sanitation, electricity, cooking fuel, shelter, and assets. (Indicator and Monitoring Framework 2022) The Human Development Report of 2020 has included environment as an important dimension. The HDR 2020 has focused on the environmental aspect as part of human development (UNDP 2020).

V. Conclusion

The UN and development organizations are aware of the need to tackle poverty through the approach of multidimensional poverty and inclusive growth. Yet, poverty and inequality continue to exist across the globe. Either the attempts at tackling poverty at the individual level have not been made by the concerned governments or development workers or they have not been successful.

In the globalized world, capitalism has evolved in the form of neoliberalism. Neoliberalism only focuses on capital accumulation with the least concern for humanity or nature. Corporate giants from the developed countries have spread their tentacles to third world countries by outsourcing production. Industries set up by multinational companies in the third world countries render the people poor by snatching their jobs and the workers at such industries are not paid adequately. This has pushed more people to seek livelihoods in the informal economy. As discussed above, people working in the informal sector remain hidden. As such, there is huge disparity in income distribution with a handful of people controlling the wealth of the world. Therefore, the governments in countries across the world need to develop mechanisms for the equal distribution of resources and wealth among their people without merely serving the interest of corporate giants.

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Governance Challenges in the Age of COVID-19 in the Republic of the Philippines: Lessons from Various Information from the Media and the International Community

Eiji Oyamada[1] and Armand Christopher Rola[2]

Abstract

The world has been facing a major global crisis in recent years in the form of a pandemic. The coronavirus disease 2019 (COVID-19) situation was proclaimed a pandemic by the World Health Organization and has greatly affected the lives of the global population. There have been millions of infections, hundreds of thousands of deaths, health care system failures, and economic disasters initiated by the pandemic. Most importantly, the weaknesses of countries' governance systems have been exposed. The coronavirus' complexity is detrimental not just to individual persons, but also to society as a whole. Lives, livelihoods, long-term health, and economies are at stake. Now more than ever, public integrity and good governance should not be overlooked. COVID-19 related scandals have been identified in both developed and developing countries such as Indonesia, Brazil, Germany, Iran, Vietnam, South Africa, USA, Serbia, and Russia. This paper, however, focuses on the Philippines. The predominantly Catholic nation has had its fair share of governance failures, corruption, and is somewhat transitioning to a more autocratic government. Poor government response, military generals leading the pandemic response, various corruption scandals, high cases, deaths, and economic and job losses – all indicate that the country's pandemic response was a failure, such that the country was ranked last in terms of pandemic response in both Bloomberg and Nikkei Asia. This research mainly drew lessons based on observations on media coverage in the Philippines and the international community.

Key words: *autocracy, COVID-19, corruption, governance, pandemic response,*

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I. Introduction

The world has been dealing with a major global crisis in the form of a pandemic in recent years. The coronavirus disease 2019 (COVID-19) was proclaimed a pandemic by the World Health Organization and has severely affected the lives of the world's population. The pandemic has caused millions of infections, hundreds of thousands of deaths, health system failures, and economic disasters. Most importantly, it exposed the weaknesses of government systems in countries around the world. The complexity of the coronavirus is harmful not only to individuals, but also to society as a whole. Lives, livelihoods, long-term health, and economies are at stake. Public integrity and good governance should not be ignored now more than ever.

A total of 244,171,008 infections, 4,958,308 deaths, and 6,842,086,729 vaccine doses were recorded as of October 2021. The USA, UK, and Russia have the highest number of recorded infections in October 2021 (JHU 2021). Although those countries have the highest incidences, it can be attributed to a bigger population. Moreover, the vaccination rates in those countries fare better than those of developing nations (Figure 1).

In terms of the case-to-fatality ratio, the regions of Latin America and Southeast Asia were the worst places to be in the world in a pandemic. For instance, Peru has a 9.1% case-fatality and 615 deaths per 100,000 people while Brazil logged 287 deaths per 100,000 people (JHU 2021). Over in Southeast Asia, Malaysia recorded 89 deaths per 100,000 people while Indonesia logged 54 deaths per 100,000 cases. The Republic of the Philippines on the other hand has 39 deaths per 100,000 people but with a smaller population than the aforementioned countries, their case-fatality was one of the worst in the region with 1.5%.

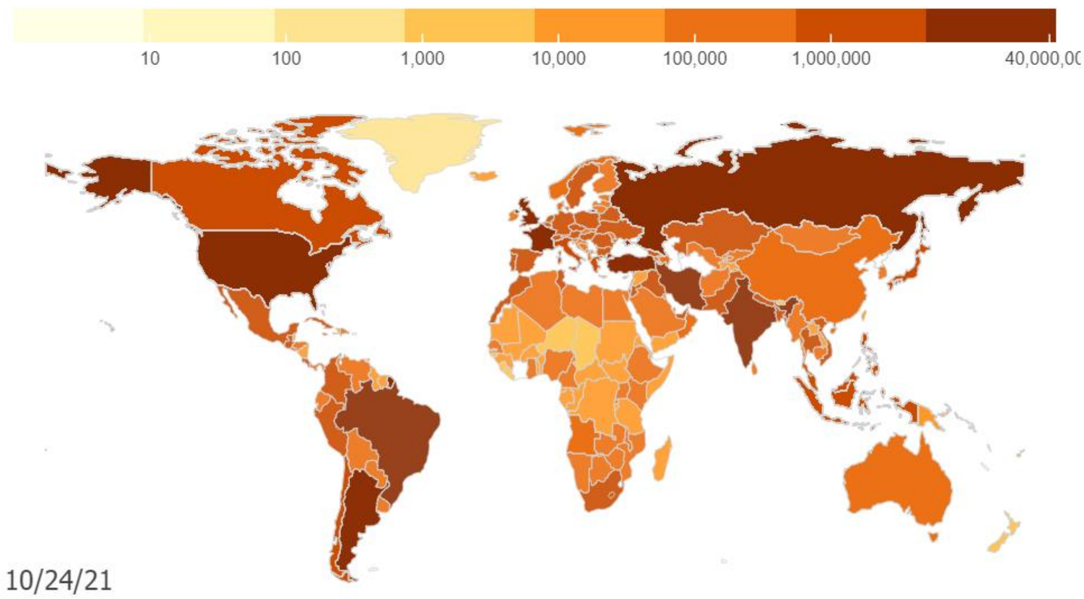

Figure 1. COVID-19 Infection Map as of October 24, 2021
Source: John Hopkins University, 2021

State governments and international organizations alike have put together resources to combat COVID-19. The World Bank shelled out USD 160 billion in funding designed to respond to the health, economic, and social shocks while the International Monetary Fund allocated USD 11 trillion as financial assistance to the COVID-19 response. In addition, the IMF also pledged USD 50 billion for low-income and emerging market countries. The United Nations appealed for an additional USD 2 billion as support for an organized international humanitarian response scheme to tackle the pandemic (TI 2020). Amid the global commitment to fight the pandemic, large-scale emergency spending by donors and state governments creates various risks that may undermine the effectiveness of government responses which could result in health, social, and economic distress.

COVID -19 scandals have been identified in both developed and developing countries, including Indonesia, Brazil, Germany, Iran, Vietnam, South Africa, the United States, Serbia, and Russia. In Indonesia, the Minister of Social Affairs was arrested for accepting large amounts of money as bribes in connection with food aid to the needy Indonesian population during the pandemic. In Brazil, the mayor of the largest city, Rio de Janeiro, was found guilty of embezzling funds in the construction of a medical facility COVID-19. The level of corruption in Brazil has been described as "extraordinary" because in April 2020, the Brazilian Parliament passed a law allowing all levels of government to make emergency purchases without delay and without the need for competitive bidding or conventional procedures. In this scenario, ventilators were purchased at an absurdly high price from a liquor store to be used in various field hospitals around the country. In reality, they were never built or put into service.

Over in Germany, the police have alerted their citizens regarding swindlers pretending to be health workers supplying coronavirus testing kits (CMI 2020). In Iran, there are details of a "well-connected network" managing the delivery and means of things necessary for the country's COVID response (CMI 2020). Vietnam's director of the Center of Disease Control was found guilty of collusion with suppliers to raise prices for medical equipment three times its original price. In South Africa, the government stopped officials allegedly abusing the COVID-19 situation to buy goods worth USD 2.4 million which were supposedly for purchasing personal protective equipment (PPE) and blankets for the poor. Moreover, the Eastern Cape Town province's health department, which is also one of the country's poorest areas, is facing allegations of buying 100 ambulance scooters for a ridiculous cost which was almost triple the original value of one unit. The CARES Act funding in the United States, which was a USD 55 million contract for N95 masks went to a firm in bankruptcy with no current employees and no history of producing or supplying masks. The company may have participated in cost-overcharging to boot, charging the US government approximately eight times as much as the other providers. In Serbia, their president openly cited that because of the limited supply of ventilators accessible in Europe, they were compelled to procure them on the semi-grey market. This scenario raised suspicion on the integrity of the procurement procedure. The Russian oligarchs on the other hand, set arrangements with physicians to be on standby to make sure that they can prevent seeking care in the Russian state-owned infirmaries. Moreover, with regards to the providers of ventilators, private buyers comprised of 30% of current sales (TI 2020). These are only examples of many cases of COVID-related corruption scandals around the world. This paper, however, will focus on examining the worst place to be in a pandemic (in the month of September 2021), the Philippines as reported by Bloomberg (2021).

The "COVID Resilience Ranking" by Bloomberg for September 2021 showed that the country has a resilience score of 40.2. The Philippines ranked 53rd out of 53 countries. Bloomberg compiled its data using 12 indicators that extend over virus control, the condition of health care, vaccination, general mortality, and development toward restarting travel and relieving border restrictions of which the Philippines ranked in last place.

A. Study Framework of an Effective COVID-19 Response

Figure 2 illustrates the framework of the study of an effective COVID-19 response which begins from the response by the national government and consists of testing, contact tracing, support for the medical sector, subsidies, and vaccination. Testing refers to the test done to an individual to indicate if they are infected by the virus. Contact tracing in this study would refer to the action or method of detecting persons who were in the vicinity of a person identified with an infectious disease in order to quarantine, test, or treat them. Support for the medical sector should include better pay and safety of the medical frontliners while subsidies come in either cash or in kind. Subsidies should be given especially to those whose economic status is heavily affected by the pandemic. Lastly, a high vaccination rate of the population is essential to attain herd immunity.

The challenges the governments face include the composition of the response team, logistics, behavior of the public, and corruption. The composition of the pandemic response team should be, in principle, medical and virology experts, as well as logistics experts for smoother implementation of various processes. These challenges will then influence the outcomes such as the number of cases, recoveries, deaths, job, and economic losses. The desired outcomes of countries amid the COVID-19 pandemic include low number of daily cases, high recoveries, prevention of deaths, and minimizing job and economic losses. To attain these ideal outcomes, the challenges to the government response should be minimized. The pandemic response team should be composed of medical and virology experts as well as logistics experts. The public's behavior is also very important as they should follow health protocols such as wearing face masks amongst others that the government impose. Lastly, corruption at all levels should be addressed. Effective government responses and minimizing the challenges as much as possible can lead to positive outcomes such as low COVID cases, high recovery rates, low to zero deaths, and reduced job and economic losses.

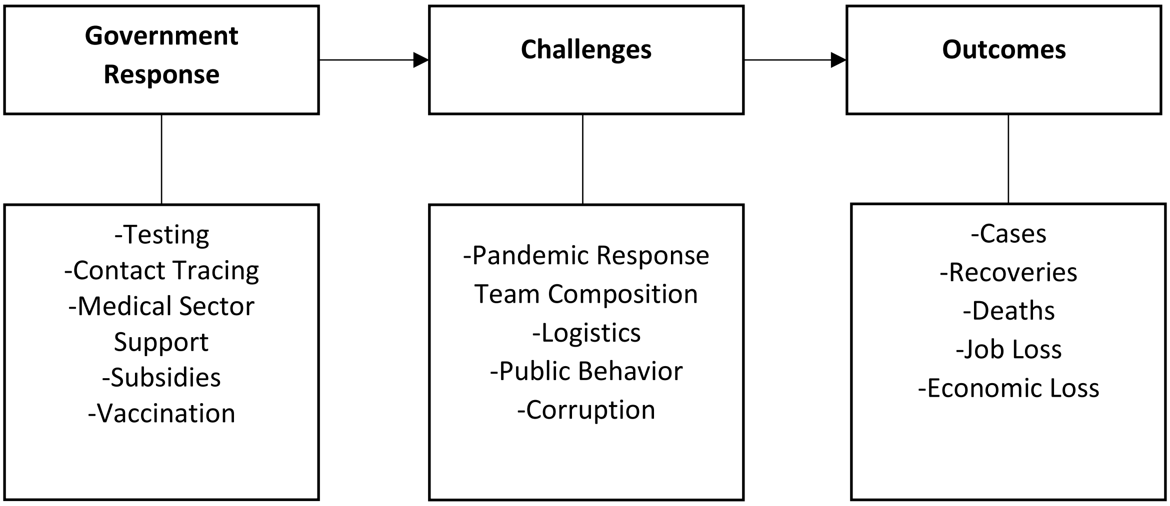

Figure 2. Framework of the Study

Source: Authors

B. Organization of the Paper

Following the introduction section of the paper, the pandemic situation such as cases, recoveries, and deaths in the Republic of the Philippines will be tackled. This will be followed by a section discussing the government response as well as the challenges facing the Philippine government in terms of governance and overall handling of the pandemic situation. A segment about post-pandemic governance will be discoursed before concluding the paper. This research mainly drew lessons based on observations on media coverage in the Philippines and the international community.

II. COVID-19 Situation in the Republic of the Philippines

As of October 2021, the number of people with COVID-19 in the Republic of the Philippines totaled 2,765,672, according to John Hopkins University data (2021). The number of deaths in the country was 42,077, while 25,955,669 people were fully vaccinated, representing 24.01% of the total population. In comparison, neighboring Southeast Asian country Indonesia has 25.22% of its population vaccinated, while

Singapore leads the region with 82.33%. In Japan, 70.33% of the population is fully vaccinated, while the percentage of fully vaccinated population in the United States is 58%. Apart from the relatively low vaccination rate, the country also has a high mortality rate of 1.5%, as shown in JHU data (2021). It was reported that the country has an average of 39 deaths per 100,000 population. In addition, the Philippines is notorious for the longest lockdown in the world, which began in March 2020 (Aljazeera 2021). Recently (as of October 2021), the Philippines was ranked as the worst place to be in the event of a pandemic, according to Bloomberg's resilience ranking, despite the decline in infections in the country (Philippine Star 2021). Apart from the Philippines, Southeast Asian countries ranked the lowest.

Like all countries in the world, the Philippines has had its share of impacts from COVID-19. The country's Gross Domestic Product (GDP) shrank by 0.2% in early of 2020, the first drop since the last quarter of 1998, a year after the Asian economic disaster (Venzon 2020). Following the country's 16.5% GDP contraction in the second quarter of 2020, the country suffered a "technical recession" (Manila Standard 2020). Philippine GDP experienced its worst shrinkage since the second world war, putting up negative growth of 9.5% in 2020, as reported by the Philippine Statistics Authority (PSA). The last shrinkage for a complete year was in 1998, in the midst of the Asian economic disaster, when the GDP shrank by negative 0.5%. The shrinkage in 2020 was also worse than the negative contraction of 7% in 1984 (ABSCBN 2021). The country managed to overcome the recession in the second quarter of 2021 and recorded a growth of 11.8% (Business World 2021). Similar to most other countries, the Philippines' retail sector was hardly affected. As reported by the Philippine Retailers Association, the "overall retail environment" recorded a decline of 30% to 50% (Van 2020). Regardless of the drop, most retailers providing basic services, including pharmacies, hardware stores, supermarkets, and convenience stores stayed open throughout the country to cater to customers, while other stores in malls were shut down (Philippine Star 2020). On the other hand, classes were suspended starting early March 2020 (Casas and Araja 2020). Like most countries in the world, the Philippines also moved to online learning. While online learning has continued, the Philippines is one of the countries that have yet to implement face-to-face classes. According to UNICEF, the Philippines is one of the last nations to allow face-to-face education to be conducted again. The only other country that still allows face-to-face instruction is Venezuela as of September 2021 (Deiparine 2021). This could have several implications for the country's education system in the foreseeable future.

III. Philippine Government Response to COVID-19

After the verification of the initial transmission of the disease in the Philippines on March 7, 2020, the Philippine Department of Health raised the alert level to "Code Red Sub-Level 1" (CNN 2020). Philippine President Duterte subsequently declared the "Proclamation No. 922" on March 9th of the same year, to officially declare a public health disaster, and allowing local government units (LGUs) to use their resources for disaster risk management (Parrocha 2020). On March 24, 2020, the "Bayanihan to Heal as One Act" was signed into law, giving President Duterte more power to address the pandemic. This law was then annulled by a supplemental law, which was the "Bayanihan to Recover as One Act" which was signed on September 11 of the same year (Rey 2020).

Right after the explosion of the confirmed COVID-19 cases, President Duterte asked Congress to conduct a special assembly on March 23 to authorize the "Bayanihan to Heal as One Act" that would give authority the President to use the needed powers to take emergency procedures to tackle the nationwide emergency linked to COVID -19 for an initial three months, of which can be prolonged by Congress. The law would permit President Duterte to reorganize, reprogram, and realign a budget amounting to approximately PHP 275 billion (about USD 5.37 billion) from the projected 2020 approved national budget of PHP 438 billion (about USD 8.55 billion) in response to the pandemic (Parrocha 2020). It also allowed President Duterte to momentarily take control of the procedure of public amenities and private health amenities and other essential amenities to use as quarantine facilities, housing of health employees, and delivery and storage of medical goods, and facilitate and streamline the approval of test kits (Luci-Atienza 2020).

As mentioned earlier, the Philippines has the longest lockdown in the world. The famous lockdown began on March 12, 2020, when President Duterte declared a partial lockdown in the capital Manila, which was then put into effect on March 15 (Esguerra 2020). The lockdown was stretched on March 16, when the president enforced an "expanded community quarantine" (ECQ) covering all of the Luzon Island and its neighboring islands. It was a complete lockdown that limited transportation, enforced a harsh home quarantine on all homes while shutting down all unnecessary private enterprises in the country. This quarantine was lengthened and re-instated numerous times throughout the pandemic. The LGUs out of the Luzon Island and the capital also took numerous procedures to restrict the propagation of the virus in their areas. In the middle of 2020, most of the country was put under a more relaxed and integrated "general community quarantine" (GCQ), though harsher measures persisted in place in some regions. Numerous outbreaks of COVID resulted to new local lockdowns (Luna 2020).

Amid the world's longest lockdown, the Philippine government has provided cash to Filipinos hit hard by the pandemic. The Department of Social Welfare and Development (DSWD) is the department in charge for executing the government's "Social Amelioration Program" (SAP). This is an emergency assistance in the form of cash to be given to disadvantaged families impacted by COVID-19 and its quarantine procedures (Cudis 2020). The department's aim is to make 18 million poor families the recipients of the program. Families with monthly salaries of less than PHP 10 thousand (about USD 200) are granted priority. The DSWD has given the LGUs the authority to distribute the cash, although the department maintains its support to the efforts of the LGUs, together with the on-the-ground authentication of recipients (Manila Bulletin 2020). Interestingly, in the second part of the SAP, President Duterte's administration transferred the duty of disseminating the cash assistance to the military and police from the LGUs because of criticisms about the sluggish payments and the misuse of the resources meant for certain sectors. The national government downloaded the relief funds under the first tranche of the SAP to local government units to provide crisis support to poor families and employees affected by the lockdown constraints (Punongbayan and Romero 2020). In addition to cash assistance, the Philippine Health Insurance Corporation (PhilHealth) declared that it will release PHP 30 billion (approximately $581 million) in advances to its official health facilities to give health workers with the funds they need to effectively tackle the COVID-19 crisis (CNN Philippines 2020). In addition, President Duterte signed "Administrative Order No. 26", which would give the country's frontline government officials and employees a regular hazard allowance of PHP 500 (about USD 10), as reported by Merez (2020).

There are various controversies about the country's mass testing. Separately, in May 2020, the national government began establishing mega swab centers by converting various existing facilities to conduct mass testing in the country. The test kits used "reverse transcriptase-polymerase chain reaction" (RT-PCR) (Mendoza 2020).

Police Chief Archie Gamboa instructed his bureau to boost its prominence in different areas and to detain without warning the persons engaged in events that disrupt quarantine procedures on spatial distance and mass meetings (Marquez 2020). Boundary barriers provided by the Philippine army, police, and coast guard were established in communal quarantine regions to regulate the movement of citizens and supplies and eventually suppress the propagation of the virus (Rita 2020). The Philippine Police also arrested persons hoarding basic commodities in shops and reporting companies that did not conform with the Department of Trade and Industry guidelines by controlling the costs of these supplies throughout the pandemic (Ramos 2020). In turn, the Navy and Air Force used their planes and ships to deliver personal protective equipment and medical necessities, and to transport health workers to different areas in the country (Sadongdong 2020).

IV. Global Efforts to Tackle COVID-19

The world can learn from the COVID-19 response failures of the Republic of the Philippines as other national governments have a totally different approach in responding to the pandemic. For instance, the main government body that spearheads the COVID-19 response in the country is mostly retired army generals. This will be discussed further in the subsequent sections. In comparison, virologists and medical experts are the ones that make decisions in most countries around the world.

International organizations and national governments alike created guidelines to tackle COVID-19 both at the international and local levels. It is up to each national government to implement them effectively, while incorporating or using their own domestic strategies. Each country has their own style, such as aiming for zero COVID cases and imposing strict lockdowns. Other countries on the other hand, choose to adapt and to "live with" coronavirus. The World Health Organization (WHO) provides intensive guidelines to respond to the pandemic. The United Nations, on the other hand, promotes their three pillars of operation – 1) delivery of a large-scale, coordinated, and comprehensive health response; 2) adoption of policies that address the devastating socioeconomic, humanitarian, and human rights aspects of the crisis; and 3) recovery process that builds back better (UN 2020).

As for national governments, Taiwan was considered an early role model as it learned its lessons from the last SARS pandemic. On the other hand, mainland China decided to take the road to zero COVID – which meant strict lockdowns and quarantines, severe border restrictions, rapid mass testing and vaccination. The hermit country of New Zealand followed a similar path but was less stringent than China. The country focused on putting funds into contact tracing, testing, and a central quarantine approach to stop community spread of the virus. New Zealanders have essentially accomplished this and essentially live in a world without COVID (Chang, Hong, and Varley 2020). South Korea certified local symptomatic kits within weeks of the virus's development, made its own, and numerous super-fast contact detectives scouring over the credit card data and camera recording to chase down COVID clusters. Similar to Pakistan, Japan, and other parts of Asia, Korea has gained from its current epidemic experience after the "Middle East Respiratory Syndrome" (MERS) outbreak in 2015 (Chang, Hong, and Varley 2020).

Western democracies have largely chosen to live with COVID but imposed lockdowns as cases increased. Western Europe is now being hit by a fierce wave that is forcing governments to enforce new lockdowns. The restraint attained during the spring was reversed when restrictions were relaxed, which allowed COVID to be scattered again by holiday travelers (Chang, Hong, and Varley 2020).

The United States recently issued its nationwide plan for responding to COVID-19 and preparing for the pandemic, which consists of seven goals: 1) restore confidence in the American people; 2) conduct a safe, effective, and comprehensive vaccination campaign; 3) contain the spread by expanding masking, testing, treatment, data, workforce, and clear public health standards; 4) immediately expand emergency response and invoke the Defense Production Act; 5) safely reopen schools, businesses, and travel while protecting workers; 6) protect the most vulnerable and promote equality, including across racial, ethnic, and rural/urban lines; and 7) restore U.S. leadership in the world and better prepare for future threats. Japan has also chosen to live with coronavirus as the country avoids the "3Cs" i.e., enclosed spaces, crowded places, and close contacts.

In addition to the Philippines, Latin American countries are also unable to cope with the pandemic. President Jair Bolsonaro of Brazil and Andres Manuel Lopez Obrador of Mexico have frequently toned down the risk of COVID (Chang, Hong, and Varley 2020). This scenario resulted in many cases and deaths, making these countries two of the worst places to be in the midst of COVID.

The countries with an effective COVID -19 response have a common denominator - on which the study framework of this paper is based. National governments should be able to effectively implement mass and repeat testing, contact tracing, medical sector support, subsidies for those most affected, and vaccination, while minimizing corruption and strong public cooperation have a positive impact on a country's pandemic response. Unfortunately, there are several factors that affect a country's response to a pandemic, including incompetent leaders, corruption, and lack of resources. In the following sections, we will explore these challenges in more detail, using the Republic of the Philippines as an example.

V. Governance Challenges, Corruption, and Path to Autocratization in the Philippines

The Republic of the Philippines was branded by Bloomberg as the "worst place to live during a pandemic" recently. The predominantly Catholic nation has had its fair share of governance failures, corruption, and is somewhat transitioning to a more autocratic government. This section will shed light on the country's response agency, the on-the-ground situation of the medical community, corruption, and the country's possible path to autocracy.

A. Inter-agency Task Force

The Inter-agency Task Force for the Management of Emerging Infectious Disease, or more commonly known as IATF, is a multi-sectoral collaboration aimed at providing preparedness and ensuring an effective government response to evaluate, monitor, curb, and thwart the transmission of a potential epidemic in the Philippines. The Department of Health (DOH) is the lead agency of the IATF, working across sectors with a wide range of members of the executive branch of government. The IATF is co-chaired by the Cabinet Secretary and the Minister of Environment and Natural Resources. It has a total membership of 34 executive agencies (IATF 2021).

On January 28, 2020, this interagency task force was activated in light of the threat posed to the country by the novel coronavirus. Its members include the Department of the Interior and Local Government (DILG) and the Department of State (DFA). Regional interagency task forces have also been established in their respective regions to respond to more local issues and concerns (IATF 2021). On the surface, the IATF looks organized and well-coordinated, but the agency's shortcomings are well known. IATF's chairman, Francisco Duque III, who is also secretary of the country's Ministry of Health, is in the middle of a multibillion-dollar corruption scandal. The other leaders of the IATF are anything but medical experts. For example, co-chair Karlo Nograles is a politician, while the other co-chair, Roy Cimatu, is a retired army general. In addition to Cimatu, Interior Minister Eduard Ano, National Task Force Chairman Delfin Lorenzana, and vaccine czar Carlito Galvez were also former military officers. By comparison, the United States'response to a pandemic includes consultations with the medical community, particularly the Centers for Disease Control and Prevention (CDC). Japan, on the other hand, has an advisory body called the Novel Coronavirus Expert Meeting. The advisory body is composed of the Japanese medical community. Many other countries around the world are letting their respective medical communities lead the fight against the pandemic. Retired army generals with no medical expertise may be one of the reasons the Philippines is losing the fight against COVID -19 and has been named the worst place to have a pandemic.

B. Actual Situation of the Medical Community

The pandemic has taken a toll on the Philippines, and at the forefront of the fight is the medical community. Even before the pandemic, the country did not have a solid medical sector. Equipment is poor, and medical personnel are not well paid. In fact, many nurses trained in the Philippines choose to work abroad after graduation. The Department of Labor and Employment (DOLE) reported that an entry-level registered nurse receives an average salary of PHP 8,000 (about USD 160) to PHP 13,500 (about USD 270) per month. Registered nurses hired by private hospitals typically get a median income of PHP 9,757 (about USD 195) per month. In government facilities, the basic monthly income of nurses is PHP 33,500 (about USD 671). On the other hand, the average monthly salary of nurses in the U.S. ranges from USD 4,000 to USD 8,000, according to the website for registered nurses in this country. This scenario tempts many of the Philippines' best medical professionals to seek opportunities abroad instead. For several years, Filipino nurses leave the country after fruitlessly trying to struggle for better wages and working circumstances (Magsambol 2021).

Contact tracing, Case isolation, and physical distancing are identified as the foundation of a successful COVID-19 response, as mentioned by the Lancet Regional Health Western Pacific (LRHWP 2021). A prerequisite for the effective execution of these approaches is a strong public health system and an adequate workforce, which were seen as insufficient and inadequate in the Philippines even before the COVID era. Inadequate financing in the infrastructure of the health sector as well as the scarcities of health workers hinder the system, while health imbalances further threaten the access to health facilities in the country. In addition, the pandemic is putting more strain on the disjointed public health system. In addition, the deficient government response has led to a lag in mass testing and contact tracing, an overworked medical system, and slow vaccine introduction (LRHWP 2021).

Medical personnel in the Philippines are also overworked, underpaid, and dying. Magsambol (2021) mentioned that frontline health workers endure the poor working circumstances and postponed services while the country grapples with the repeated rise in infections from the highly communicable delta variant. Not only are these employees' wages low, but payment of the risk premium has been delayed. Some have not even received them. Frontline medical workers were supposed to receive benefits as a reward for their service on the front lines. But in reality, that is not the case. The DOH clarified that problems with administration added to the setbacks in releasing reimbursements, as it first had to verify that the medical personnel actually treated infected persons directly. Philippine senators mentioned that all health employees, whether or not they directly treat COVID-19 patients, should receive the "special risk premium" because they are all in danger of getting the virus (Magsambol 2021). In addition, two out of five COVID -related deaths in the Philippines are health care workers, and about 2% of all positive cases also worked in the health sector (Sabillo 2021).

Although the President has the power to allocate resources to fight the pandemic, it is evident that the resources are not in favor of the weak health sector. The president of the country's Nurses Association, Maristela Abenojar, criticized the government's response, saying, "Many promises have been broken. This is their pattern of behavior: they will investigate this and that. We are in a national health emergency, so any action should be fast. Every hour, every day you waste can cost someone's life." These scenarios caused several health care workers to quit their jobs or go abroad (De Vera 2021).

C. Corruption

The Republic of the Philippines is one of the most corrupt nations in Asia and in the whole world. The young democratic country, which was under colonial rule for four centuries, suffered two decades of dictatorship and has never really bounced back since then. The COVID-19 pandemic yet again provides opportunities for corruption. Easy examples include the procurement processes as the nation's heavily bureaucratic system buckles under the misappropriation of funds.

In testing for the virus alone, there are many anomalies that can be identified. The Morningstar (2020) broke down the expenses. It begins with screening which costs PHP 510 followed by diagnostic work-up amounting to about PHP 800, followed by specimen collection costing PHP 947. Then another PHP 451 for specimen transport. Finally, the polymerase chain reaction (PCR) testing costs PHP 5,422. All these make for a total of about PHP 8,150 or about USD 162. Medical experts mentioned that it is not necessary to do screening and diagnostic work-up since testing only requires nasal swabbing, which would not cost the PHP 947 being charged for specimen collection. Moreover, it is absurd to pay for specimen transport (or courier service), thinking that patients needed to go to the laboratory to get tested (Morningstar 2020). In a dialogue at the House of Representatives, Congresswoman Janette Garin, an ex-secretary of health, stated that a private establishment is surrounding the importation of Natch-CS (a fully automated extraction instrument used for testing COVID-19) as well as MA-6000 tissue culture kits, by claiming to be the exclusive distributor of their manufacturers. Government bureaus were "forced" to purchase from this private enterprise, instead of dealing directly with foreign manufacturers. Garin also admonished the DOH for not buying PCR or swab-testing kits immediately from overseas producers to slash the testing cost. She said that the real price of the test kits (complete with reagents and consumables) obtained promptly from overseas producers is only PHP 800 to PHP 900 (about USD 16 to USD 18) per complete set (Morningstar 2020). From these figures alone, we can calculate those billions of pesos have already been misappropriated.

In addition, the costing of USD 162 is just too high especially for a developing nation like the Philippines. By comparison, the average cost of testing in the United States is between USD 36 to USD 180 depending on the location according to the data by John Hopkins University (2021), while in Japan, the average cost of testing is between JPY 3000 to 46000 (about USD 30 to USD 460) according to Metropolis Japan (2021). In Vietnam, the average cost of testing amounts to VND 734,000 or about USD 29 (Vietnam News 2021).

Another major corruption scandal in the Philippines amid the pandemic involves the country's national health insurance fund. Representatives of the troubled Philippine Health Insurance Corporation were accused of stealing some PHP15 billion (about USD 300 million) through various fraudulent schemes, according to a former official (Jalea and Peralta 2020). The corporation's former anti-fraud officer, Thorrsson Montes Keith, who had previously quit over "widespread corruption" within the agency, claimed that "mafia members" were responsible for what he called the "crime of the year" because of irregular dealings (Jalea and Peralta 2020). The missing funds were the unlawful discharge of temporary compensation mechanisms or funds earmarked for "random events" like the COVID situation to hospitals that had not yet registered COVID -19 cases. The sum also consisted of the allegedly overvalued information technology systems that the corporation would like to acquire (Jalea and Peralta 2020).

Among the corruption scandals in the country, nothing is more scandalous than the Pharmally Pharmaceuticals Corporation scandal. The Pharmally scandal brought into focus the role of middlemen in buying agreements, which are not deemed as unlawful. However, it is a caution when intermediaries are making billions from dubious contracts while many citizens are enduring the negative effects of the pandemic COVID-19 (Baclig 2021). The government lost PHP 5 million in its first purchase deal with foreign-owned Pharmally Pharmaceuticals Corp or simply Pharmally. A chart by Ed Lustan (2021) summarizes Pharmally's transactions with the Philippine government (Figure 3).

A Senate inquiry described the costly first transaction between TigerPhil, Pharmally, and the PS-DBM as follows:

- March 12, 2020: Greentrends Trading International sells TigerPhil 500,000 face masks at a unit price of PHP 18, for a total amount of PHP 9 million.
- March 12, 2020: TigerPhil buys 500,000 face masks from Greentrends at a unit price of PHP 18 each, or for a total of PHP 9 million.
- March 25, 2020: TigerPhil sells the face masks to Pharmally at a higher unit price of PHP 23.90, the latter paying PHP 11,950,000.
- March 25, 2020: PS-DM purchased the face masks acquired from Pharmally at a unit price of PHP27.72, which was PHP9.72 higher than the price set by Greentrends and PHP3.82 higher than TigerPhil's unit price. The government procurement agency paid a total of PHP13.86 million for the said face masks.

By adding the markup to the price of the face masks originally sold by Greentrends, TigerPhil earned at least PHP2,950,000, while Pharmally earned around PHP1,910,000 in just one transaction.

The company acted as a middleman and still earned a total of PHP393 million from government contracts for the supply of face masks and face shields from April to June 2020, Senate Minority Leader Franklin Drilon said last month. Aside from the estimated profits from the multibillion-dollar contracts, Senator Richard Gordon revealed the brand-new luxury vehicles worth PHP52.9 million registered to Pharmally's top three executives shortly after the company landed the juicy government contracts (Baclig 2021).

As reported by the Philippine Daily Inquirer, the prices of the expensive vehicles allegedly owned by the three Pharmally executives were PHP13.5 million for Lincon Ong's Porsche Carrera and another PHP5.9 million for his Lexus RCF, PHP13 million for Twinkle Dargani's Lamborghini Urus and PHP8.5 million for Mohit Dargani's Porsche 911 Turbos S.

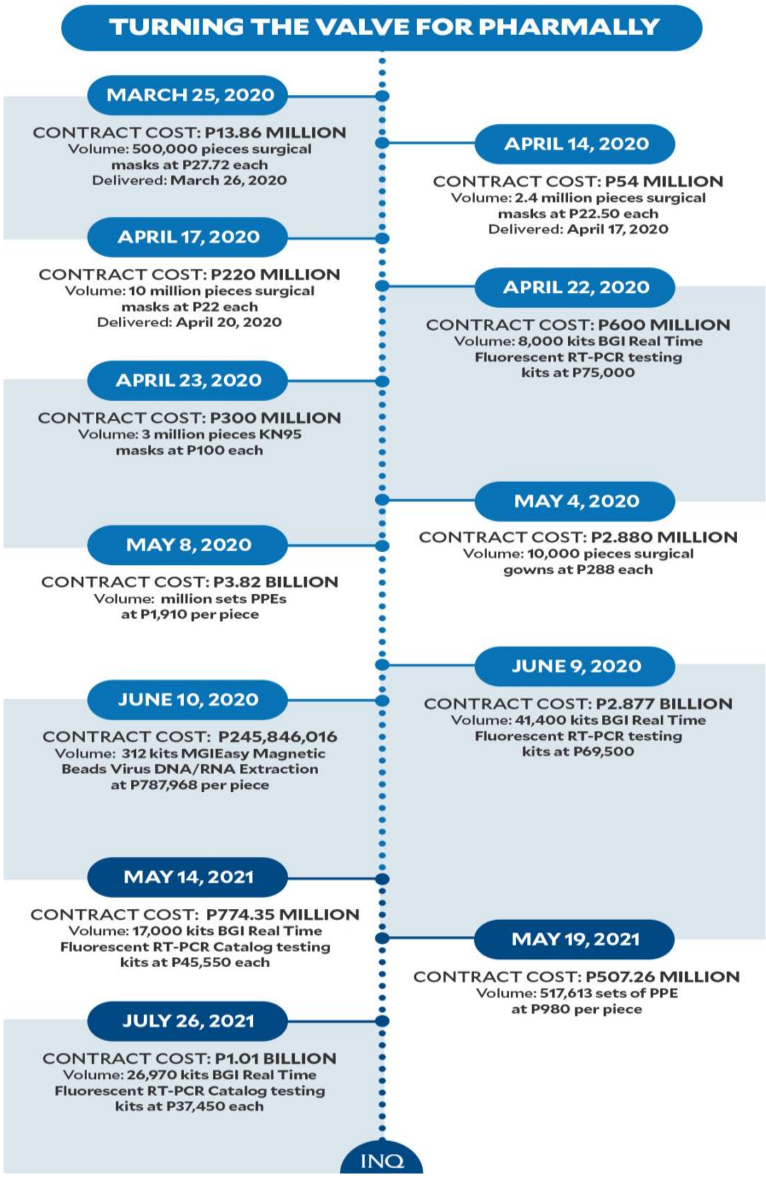

Figure 3. Turning the Valve for Pharmally: History of Transactions between Pharmally and the Philippine Government

Source: Ed Lustan, the Philippine Daily Inquirer

Aside from these corruption scandals, the Philippines is also one of the largest borrowers from the World Bank. San Jose (2021) reported that the Philippines was named by the WB as its top borrower for fiscal year 2021 with USD 3.07 billion in loans requested by the country for its fight against COVID-19. The funds were also lent to boost the local economy as we face the largest pandemic-related output gap in the East Asia and Pacific region. By comparison, in 2020, the country borrowed only USD 1.87 billion through the World Bank's lending arm, the International Bank for Reconstruction and Development (IBRD). In stark contrast, while we are the largest borrower of COVID -19-related loans, the Philippines ranks last in the latest Nikkei COVID-19 Recovery Index, as reported by San Jose (2021). Of the 121 countries in the index, the Philippines ranks last in the following categories: infection management, confirmed cases of COVID -19 compared to the number of peak cases, confirmed cases per capita, tests per case, vaccine introduction, total vaccine doses administered per capita, new vaccine doses administered per capita, proportion of people fully vaccinated, mobility, community mobility, Oxford Stringency Index, and flight activity. It is interesting to note that, as mentioned earlier, the predominantly Catholic country also ranks last in the Bloomberg list.

These are only a few examples of major corruption scandals in the country as countless more put the lives of the Filipino people at risk. Undeniably, as stated by UN Secretary General Guterres, “corruption is even more damaging in times of crisis as the world is experiencing now with COVID-19”. The Republic of the Philippines is just one of many examples where corruption has been more rampant amid the pandemic. These scenarios provide glimpses of the future of democracy and post pandemic society.

D. Changes in the Perception of Corruption in the Philippines

The assessment of corruption in the Philippines has deteriorated for the second straight year according to the report by Transparency International (TI) (2021). The country’s Corruption Perception Index (CPI) slid two places from 113 in 2019 to 115 out of 180 countries in 2020. In 2018, the country ranked 99. This is the lowest since 2011, when the country ranked 129th out of 178 countries included in the index at the time.

According to the Philippine Star (2020), the CPI is an annual report that ranks nations and territories based on the observed levels of public sector corruption, based on evidence from experts and businesspeople. The report employs a range from zero to 100, in which zero is extremely corrupt and 100 is extremely clean. The Philippines was first incorporated in the list in 2010, having a ranking of 134. It constantly improved in the succeeding years, with a rank of 129 in 2011, 105 in 2012, while 94 in 2013. The country achieved its highest ranking in 2014 at 85 (PhilStar 2020). The decrease in the country’s CPI ranking can be attributed to the corruption scandals related to the government’s handling of the coronavirus. Although there are no domestic reports yet regarding how the Filipino people perceive the corruption levels in the country, the public’s impatience with the government is evident, as seen in social media and as reported by other media outlets. Perhaps the coming 2022 elections will reveal what the Filipino people really think about corruption in the country.

VI. Democracy and Post-Pandemic Society

The case of the Republic of the Philippines sets a prime example of a democratic nation transitioning into an autocratic nation as the COVID-19 pandemic looms. The Philippines is not alone though, as world autocracies are now home to 68% of the global population (V-Dem 2021). According to the Democracy Report by V-Dem (2021), most democracies acted responsibly but nine democracies registered major violations and 23 moderate violations of international norms. Moreover, 55 autocratic regimes engaged in major or moderate violations. In addition, two-thirds of all countries, imposed restrictions on the media while one-third of all countries have had emergency measures without a time limit (V-Dem 2021).

Since the pandemic began, many democratic countries on the verge of autocratization have started their transitions. The Democracy Report of 2021’s data (Figures 4 and 5) provided evidence on the worsening quality of democracy globally. These gradual erosions in democracy are leading to constraints in freedom and a recession in democracy leads to autocratization. With the disparity evident in the predicted conventional theory of democracy, democratization is stagnant despite the economic development in developing or emerging countries. There is evidence that there is a shift to supporting and strengthening autocratic regimes, as illustrated in Figure 5. While there were some countries that democratized, more democratic countries turned autocratic. The United States, India, and Brazil are large countries that have contributed to the rapid increase in autocratization globally. Aside from these population giants, Belarus, Ethiopia, and other African nations, the Philippines, and Thailand in Southeast Asia were among the countries autocratizing substantially and significantly.

Autocratization usually follows a similar pattern. First, the ruling government attacks the media and society. Then follows the polarization of society by disrespecting opponents or spreading misinformation.

In the case of Philippine President Duterte, his attacks and tirades against the media are very well documented. Duterte attacked Rappler News and initiated the closure of ABS-CBN, the country's largest media network. The franchise of ABS-CBN was not renewed, leading to the closure of the station. The station, which used to broadcast ABS-CBN, became the station of the People's Television Network, better known as PTV-4. The network is the flagship of the Philippine government and is under the supervision of the Presidential Communications Operations Office (PCOO). This network can be easily used to carry out propaganda and spread false information among the Filipino masses. Especially in the most remote rural areas, PTV-4 is the only source of information for the people. The Duterte government also uses false information to attack political opponents. As Jenkins (2017) noted, "Now to the Philippines, where foul-mouthed online trolling is not only legal but openly courted to support political campaigns or denigrate opponents". Hosts of trollers have helped President Duterte rise to power, while his rivals have been accused of similar dirty tricks. These are the foundations that have greatly strengthened support for autocratization in the Philippines.

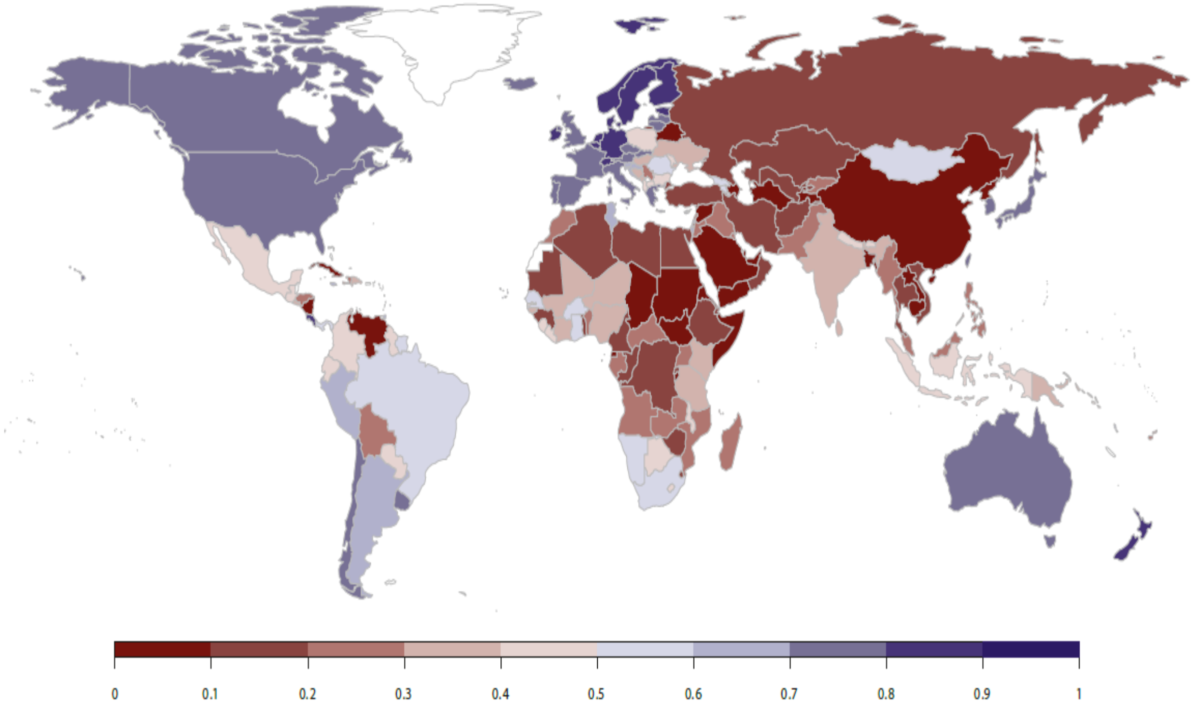

Figure 4. The State of Liberal Democracy in 2020

Note: Countries marked in red show where the LDI has declined substantially and significantly over the past 10 years. Countries marked in blue show where the level of democracy has advanced. Countries in grey are substantially unchanged.

Source: Democracy Report 2021

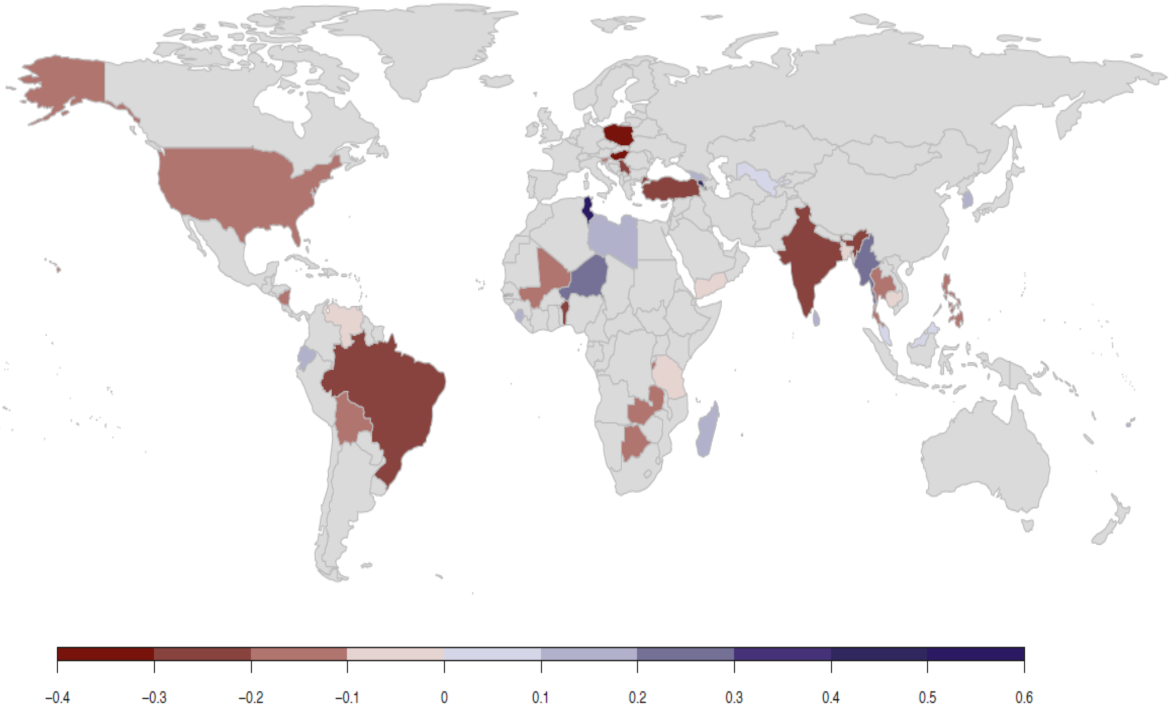

Figure 5. Countries Democratizing or Autocratizing Substantially and Significantly, 2010–2020
Note: Countries marked in red show where the LDI has declined substantially and significantly over the past 10 years. Countries marked in blue show where the level of democracy has advanced. Countries in grey are substantially unchanged.
Source: Democracy Report 2021

The justification for autocratization starts from protecting national sovereignty then ensuring the accountability and transparency of the local civil society organizations. Another justification of autocratization is fighting against terrorism and national security threats (Rutzen 2015). In the Philippines for instance, President Duterte signed into law the National Anti-Terrorism Act to “prevent, prohibit, and penalize terrorism”, thus rescinding Republic Act No. 9372, and evolving from the “Human Security Act of 2007” (Philippine Gazette 2020). This was a result of autocratization in a democratic country such as the Philippines. The phenomenon of “deconsolidation” in democracies begins with the public perception, where there is a decline of people’s trust in democracy, especially the younger generation. In another example, with the “soft power” of the two economic powerhouses of China and Russia, their policies are making democracy less attractive. Consequently, there was a rise in populist parties with politics of intolerance, putting emphasis on the countries’ own profits in foreign policy. For example, Former President Donald Trump’s “America First” policy. This scenario further undermines the charms of a Western democracy which then causes negative effects for democratization (Carothers and Brown 2018).

The economic downturn in western countries causes a decrease of aid flow in the emerging and developing countries. This equates to less pressure for the promotion of democratization. Amid the economic turmoil of the west, more and more developing countries are turning to the rising China for economic ties. Unlike the developing nations’ ties with the West, economic assistance from China is without conditions in human rights and internal political issues. This scenario means that the developing nations’ governments can impose more restrictions on the opposition party and have more control over the media, and only need comparatively less efforts in restricting civic space. Democracy is becoming less attractive globally as it was not able to keep its promise of achieving freedom and wealth. Instead, neoliberal economic globalization in western democratic countries has produced de-industrialization, increased youth unemployment, income inequality, and poverty. On the other hand, the autocratic China was able to recover from the Lehman Brothers crisis in 2008, which caused a global recession, and was able to maintain its long-term growth. The “Chinese style” state-led market economy, or “Beijing Consensus” is now considered to nurture economic growth and is more influential now than ever before.

The democratic recession of a country is the result of a combination of domestic factors, the weakening of international factors that promote democracy, and the increase of international factors promoting autocratization. Instead of a political party leading a coup d'état, an outwardly legitimate democratic erosion is mainly taking place. For instance, the Philippines domestic factor is the Duterte administration, which strengthened its ties with China and Russia, an international factor that promotes autocratization, while distancing itself from the western democracies. Values are silently shifting from supporting a democracy where policy making is time consuming, to having a strong and competent leader to pave the way, even at the cost of minimized freedom and rights. Especially now amidst the pandemic, many democracies are starting to autocratize further.

VII. Conclusion

Autocracy is swiftly on the rise more than ever before as the COVID-19 pandemic puts democracy at risk. On paper, it seems that autocratic countries handle the pandemic better than democracies, which has prompted other developing nation democracies to lean more on autocracy. The Philippines is one of those countries that is transitioning to autocracy, which was supposed to do better in responding to the pandemic. The study framework of the paper proves otherwise.

As governments across the world were gradually able to lift lockdowns, restrictions, and re-open their economies and schools, the Philippines are still lagging way behind. The country continues to impose different kinds of lockdowns in addition to the prolonged closure of schools. It is becoming more and more evident that the retired army generals, who are the leaders of the country's COVID-19 response, the IATF, do not know what they are doing, or what they are supposed to do. Yet, President Duterte would rather let them lead. Things have improved somewhat recently, as the government now listens to the advice given by OCTA Research, a research body of the University of the Philippines specializing in COVID-19. Aside from the poor choice of pandemic response leaders, government fund mismanagement has also contributed to the country's poor COVID-19 management. The PHP 15 billion (USD 300 million) from the country's Department of Health – the institution that was supposed to frontline the fight against COVID, instead mismanaged the Filipinos' taxes. As of writing this report, no officials have been punished and what happened to the mismanaged funds remains a mystery. A huge corruption scandal, which involved the private company Pharmally, allegedly earned billions from government contracts while they provide medical supplies to the government. Pharmally's price quotation was much higher than the average prices of COVID-related medical supplies. In addition to these, there are various government projects, such as the beautification of Manila Bay, that were non-essential especially during the pandemic. The country was also the top borrower from the World Bank, with USD 3.07 billion in loans. Despite this, President Duterte always tells the public that the government has emptied its coffers and that the country does not have any more money.

It remains a mystery as to what happened to the huge amount of loans and the mismanaged funds. The country has poor contact-tracing capabilities because it lacks infrastructure. The sustained closure of schools would also affect the education of Filipinos in the long run. Although the upper class can afford to conduct classes remotely, it might not be as good as conducting classes face-to-face. A different scenario can be seen in the lower class – as many of them have no access to digital infrastructure to attend online classes. The prevalent lockdowns on the other hand will have a lasting effect on the country's poor. The working class relies on jobs that are paid on a daily basis, and with the closure of establishments with little to no support from the government, the country's poor would suffer the most. The missing funds could have built a foundation for all these aforementioned problems; unfortunately, this is not the case.

Poor government response, military generals leading the pandemic response, various corruption scandals, high cases, deaths, and economic and job losses – all indicate that the country's pandemic response was a failure, reaching the point where the country was ranked last in terms of pandemic response in both Bloomberg and Nikkei Asia. Indeed, autocratization is not necessary to respond better to the pandemic and the world can learn from the Philippines' failures. The country's way forward will also be interesting to look at, as a military man, a boxer, and the son of a former dictator will vie for the position of top official in the country.

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III. Articles

1. Diallo Asmao,
   Mali's Land Tenure Systems: An Assessment of Small-Scale Female Farmers Plot Proprietorship and Legal Rights

2. Kanatbek Beishenaliev,
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Mali's Land Tenure Systems: An Assessment of Small-scale Female Farmers' Plot Proprietorship and Legal Rights

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Abstract

Women in rural Mali contribute much to agricultural production in addition to their ordinary work and reproductive work at the household level. They perform many farming activities, including producing, processing, and marketing. Even though women play a central role in agricultural activities, they remain the most affected by land tenure insecurity. Women represent 51.6% of the rural population, make up 60% of the farm labor force, and account for approximately 80% of food production, yet only 16% are landowners (EAC 2012; INSAT 2018). Challenges to women's land ownership are rooted in the pre-colonial societies, reinforced by the colonial administration, and sustained by the post-independent governments. With the advent of democracy in 1992, the government has taken some initiatives to reform the agricultural sector and promote women's tenure rights by enacting statutory laws and policies. One of the most important of these laws is the Agricultural Orientation Law (AOL) of 2006, aiming to modernize Mali's agriculture while promoting gender equity on family farms in rural areas. This article assesses how land tenure systems changed in Mali from pre-colonial, colonial, to post-colonial times and how small-scale female farmers' tenure rights have also evolved within these systems after the enactment of AOL. To achieve this objective, interviews, questionnaires, and focus group discussions were conducted in the Baguineda and Kati areas of Mali with agricultural cooperative members, government officials, traditional leaders, researchers, and NGOs between January 20 and February 28, 2020. The results reveal that efforts to revive the agricultural sector through the enactment of the AOL, which primarily aims to modernize agriculture, have been insufficient, partly because of the complexity and incoherence between the statutory and customary tenure systems. Little land has been allocated to women farmers due to biased beliefs on their ability to produce efficiently. As a result, small-scale female farmers are still employed as laborers on larger farms managed by national and international investors. Women's unawareness of their legal tenure rights and barriers to accessing essential services have further made them vulnerable. This study suggests harmonizing statutory laws with conventional practices to avoid land conflict and discrimination. It also recommends enforcing law implementation in state-managed areas while strengthening women farmers' capabilities, which remain necessary for their socio-economic empowerment in the agricultural sector.

Keywords: Agriculture, land tenure systems, statutory law, customary law, Mali, women

I. Introduction

A wide range of studies by development experts has explored the challenges women and farmers face in agriculture (Agarwal 1997; Kevane 2004; Lastarria-Cornhiel 1997). They have argued that women are often underprivileged by legal and customary land tenure arrangements, resulting in them having fewer rights to property, water, and other natural resources. Similarly, Jaquette et al. (2006) asserted that customary practices entrenched in outdated cultural land-use norms continue in parallel with state conceptions of land tenure and management. Tinker (1990) also contended that women regularly miss out on the allocation of property entitlements crucial for food security and growth. Likewise, Boserup (1970) stated that unequal gender interactions and females' unprotected rights to property inhibit them from partaking in decision-making around land and natural resource utilization in several countries throughout the world. Besides, women's inadequate education impedes their knowledge in ways that conventional rights restrict their prerogatives to utilize land, subjecting them inadvertently to involuntary expulsions (Nuwagaba et al. 2003).

In sub-Saharan African countries, most female farmers are often dispossessed of their plots, or, in cases where they can access land, they hold fewer rights and less decision-making power over those lands. Generally, women gain access to the plot via a male family member (father, husband, or brother), who determines how the property must be precisely utilized (Djiré 2005). In some cases, women might have joint entitlement to the household plots with their spouse; when their male co-owner dies, this right may be constrained (Djiré 2005). As a result, fewer than 20% of sub-Saharan African landowners are women (Caracalla 2011). Although prevalent law defends females' land rights, the absence of legal information and a fragile application process hamper women in working out these prerogatives. Women have legal land rights; in theory, the outcomes are hardly fair in practice (Tinker 1990).

Females' and males' relationships to land generally alter based on structure and social arrangements, predominantly kinship systems and gender structure (Djiré 2004). Women farmers in Mali share the above-highlighted characteristics. As stakeholders in agricultural activities, women are the most affected by land tenure insecurity. For instance, 95% of women are engaged in farming activities in rural areas, yet only 16% are landowners (EAC 2012; INSAT 2018). Women are mostly de facto occupants and embody most agricultural activities, including producing, processing, and marketing agricultural products throughout Mali. Women and men live in cultures that depend on survival economics that are quickly shifting, as are the rules and traditions that regulate these economic collaborations (Diarra 2006). In the southern parts of Mali, where farming is intensively practiced, women cannot traditionally own land in these regions. They can cultivate or use land temporarily. Still, land can be taken back from them at any time, preventing many women in rural areas from participating in land improvements such as developing irrigation infrastructure, fencing, or tree planting (USAID 2012). Purchasing a plot remains restricted by females' domestic chores, which neither offers secure revenue nor a means of saving appropriately. Women are expected to carry out household nutrition provision activities and care work strengthened by patricentric regulations within the household structure, disqualifying them from acquiring land ownership (Gladwin 2002). The persistence of gender inequalities in acquiring land and other farming assets influence women smallholders' and entrepreneurs' capability to contribute cost-effectively, administer, and benefit from new economic gains (Nuwagaba et al. 2003).

Women regularly create associations that appeal for land to be allocated for their collective use to improve their land tenure protection, often for communal gardens or fields (Diallo 2021). Understanding women's lack of land ownership in contemporary Mali requires examining the evolution of land tenure administration by analyzing how the land has been managed over time, i.e., land institutions and management. The structures in charge of their implementation, their established function, how they addressed contemporary issues, and whether women's rights are respected within the existing systems are all matters to be investigated.

To achieve this objective, it is important to clarify the concept of land tenure. The word "tenure" is derived from the French word *tenir* (to hold), so, in the African setting, the vocabulary of land tenure implies the actual relations of people to the land and the methods of conflict resolution deriving from it. Accordingly, land tenure refers to "the institutional structure which governs the provision of access to land and other natural resources and how this entry is guaranteed beyond communities. It further identifies the development of the institutions organizing land tenure and property rights agreements" (USAID 2011). In line with the major stages of the country's socio-historical and political evolution, the study schematically identifies three main phases in land governance in Mali: the pre-colonial, colonial, and post-colonial tenure systems. In the following lines, this article will briefly explain the research methodology and overview the major phases in Mali's land governance. This will be ensued by assessing contemporary statutory law, mainly the Agricultural Orientational Law, which grants attention to women's land ownership. How women understand this law and its impact on their land tenure systems in current society will be examined. The outcomes reveal that women's land ownership is still challenging due to the complexity and incoherence between statutory and customary tenure systems.

(a) Study Sites and Research Methods

To assess small-scale female farmers' land rights in Mali, I conducted fieldwork in two agricultural areas in Mali between January 20, 2020 and February 28, 2020. The first area is Baguineda, which is 30 km from Bamako, Mali's capital city. It has a population of 40,095 as of 2019, of which 19,582 are women (OPIB annual report, 2020, p. 35). Baguineda people reside in villages comprising 30 to 300 family units. Each household has on average 2 to 13 workers per agricultural production unit (APU), mainly engaged in agriculture, livestock farming, logging, fishing, handicrafts, and trade activities. Cereal crops (rice in the irrigated fields; sorghum and maize in the non-irrigated areas) dominate agricultural activities. Market gardening husbandry is the dominant activity during the off-season. Rice, maize, millet, and sorghum are the main cash crops. Vegetables such as onion, cabbage, lettuce, tomato, okra, eggplant, groundnut, mango, watermelon, and other fruits are also cultivated. On average, each household grows rice or vegetables on 0.63 ha in the managed area of the OPIB, while 3.5 ha in the rainfed area are used for millet or sorghum cultivation.

The Office du Périmètre Irrigué de Baguineda (OPIB), the irrigated perimeter of Baguineda, is one of the three agro-ecological zones created in 1926 during the French colonization of Mali with a channel excavation from the Niger River. The OPIB covers 1,347 ha of irrigated land, 1,849 plots of 0.63 to 0.025 ha on average. The Baguineda office increases crop production as supported by the OPIB dam's water resources. The irrigated edge of Baguineda is under government management, making it different from other agricultural lands. For this reason, Baguineda is a good case study with more potential for women to access irrigated land.

The second study site is Kati, an urban commune and the biggest city in the Koulikoro region. Kati covers 9636 km² and is 14 km from Bamako, the capital city of Mali. For operational reasons, Kati's circle has been divided into two zones, each with its plan. The northwest district of the river comprises 24 communes with a population of 610,024 inhabitants, while the southeast district of the river includes four communes and a population of 310,183 inhabitants (Issiaka et al. 2015). The two districts' primary economic activities in rural areas are mainly agriculture (millet, maize, and groundnut cultivation).

Vegetable crops (onion, tomato, eggplant, etc.) are also grown in the region because of their proximity to the capital and trade potential. The rural inhabitants reside in villages that range from 20 to 200 households. The standard family size is ten individuals and varies from 6 to 13 individuals. Smallholder farmers' production is mainly survival-oriented, and, generally, households are engaged in growing on land they traditionally own. The lands ownership systems are based on customary laws and traditions. Each household has, on average, half a hectare of farmland, depending on the village and population size. Small-scale agriculture offers most of the food supplies for families in both Kati and Bamako, with farmers providing for domestic consumption and the remainder being traded in local markets. Kati remains a thriving market town for potatoes and vegetables in Mali. Individual farmers also practice livestock breeding to improve their incomes.

Despite the proximity of the two study areas with the capital city, variation in land ownership systems remains. There are two major explanations for this. Firstly, Malian communities are not homogeneous even though some similarities are found; each society has its own established patterns and norms regarding the family establishment, structures, social interactions, and resource management among community members. Often, disparities in land management and access are found within the same community. For example, land access is primarily based on statutory tenure systems in urban Bamako areas. In contrast, in the peripheries of the capital city, people can access land through customary tenure systems. Secondly, the differences in land tenure systems between the two study areas are also explained by the fact that the Baguineda area benefited from a managed or irrigated site (OPIB) overseen by the government. All the land in the OPIB areas is totally under state control. Most of the households in this area have access to some irrigated land. Besides this, they also maintain access to their traditional plots, which they acquired from inheritance or through customary tenure systems. While in the Kati area where the survey was conducted, there is no irrigated area managed by the government for agricultural activities, farmers in Kati rely on traditional landholding systems through customary leaders or families for their farming activities. They further rely on rainfall during the rainy season and on wells and streams during the dry season for their market gardening activities.[1]

To understand women's land ownership in these two areas, I conducted interviews at the national level with institutional actors (government officials in different ministries and NGOs, agricultural extension agents, and local rural services) and at the community level with traditional and religious leaders, civil society organizations, the rural population, and women's cooperatives involved in the production, processing, and marketing of agricultural products. Interviews, questionnaires, and focus group discussions were formally conducted with each area's local agricultural department, extension agents, and the actors mentioned above. Regarding the data collection techniques, the questionnaires, interviews, and focus group discussions were focused on questions about the cooperative's creations, degree of organization, characteristics of its membership, visions, and ideals. The questionnaires also addressed the cooperative members' land deed apprehensions, their understanding of land tenure laws and policies in Mali, and their knowledge about the Agricultural Orientation Law and its implication in rural areas. Lastly, the questionnaires addressed the cooperatives' responsibilities in empowering their members' land ownership and access to other agricultural resources.

II. Overview of Land Tenure Systems in Mali and the AOL

A. Land Tenure Systems in Mali

Pre-colonial African societies, such as the Malian ones, were based on rules reflecting the country's socio-economic, political, and cultural realities. These rules were a mixture of precepts originating from religious beliefs and conventions between communities established by the ruling organizations (Djiré 2010). In Bambara, the most widespread language of Mali, they bear the name "Ben-kan," literally translated as "conventional wisdom" (Cissé 1997). In this vein, Malian societies were inseparably linked to the notion of convention. These conventions recognize and legitimize the domination of a lineage, a community, or a group of communities over specific resources, including land. During pre-colonial times, access to land and resources was based on the principle that they belonged to the first occupants. When newcomers do not impose themselves through battles, they must conclude effective agreements with the early settlers (Hilhorst et al. 1998). Under these conventions, indigenous organizations were often assigned authority to ascertain procedures regulating land management, usage, allocation, and other natural assets (Fernandes et al. 1998).

These conventions—often conflictual—have established various mechanisms of social regulation that have contributed to establishing a negotiated order (Coulibaly and Diakite 2004). But this negotiated order, like any legal order, always reflects a steady power balance between the social classes and strategic groups involved. The agreements focused on challenges and value systems well internalized and understood by all social actors (Djiré 2005). Although mostly unwritten, they are still relevant to collective knowledge and social practices. Such conventions exist almost everywhere throughout Mali and determine contemporary communities' social patterns and local rules. In pre-colonial times, married women had no rights to land for

[1] Source: My fieldwork results.

fear of destructing the conventional household land systems attained via inheritance. While safeguarding family interest remains the rationale behind various traditional land tenure practices in farming societies, tribes and extensive family alliances retain essential attributes to maintain command over land and resources inside the extended family unit (IDRC et al. 2002).

French colonial times in Mali introduced drastic adjustments to pre-colonial land tenure structures. The French colonial governments destabilized the established superpower of local groups, in which indigenous farmers and pastoralist communities were accountable for distributing and implementing land and natural resources. Colonial land legislation was based on two essential principles: strengthening the land ownership of the colonial power and expanding the model of dominant Western private property under state self-supervision. In this regard, the French system was based on the eminent domain theory, which originated from the feudal system that makes the state the sole owner of the land (Djiré 2010). This theory would be reinforced by the concept of "vacant land or land without an owner," which already existed in the French civil code and was introduced into the colonial legislation to take over indigenous lands (Kanté et al. 1994). The early years of colonization were thus characterized by the adoption of several texts enabling colonial land ownership systems while renewing the previous precolonial systems. The colonial tenure systems further set restrictions on land owned collectively or land distributed by community leaders. During colonization, such land could only be leased or sold with the governor's approval (Chauveau 2003).

This approach initially led to the transformation of individual land into the private domain of the state. Vacant land or land without an owner was allocated to meet the colony's needs and assigned to the colony for an individual's benefit (Chauveau 2003). Secondly, the land ownership system would convert customary rights into land titles through a registration procedure. In addition to these two approaches, a third system, which failed to recognize traditional land rights, was implemented (Guillen et al. 1990). As of July 1906, legal tenure registration was a prerequisite for using or leasing public land (Kornio et al. 2004). The procedures for obtaining property rights based on French law were complicated, making indigenous people reluctant or unable to request it. During colonial times, indigenous people, mainly women, were excluded from accessing land. Women were encouraged to stay at home and pursue productive and reproductive roles. These roles assigned to women were necessary for the continuity and sustainability of the imperial economy as they needed labor (young people) on the farm to sustain their industries.

Following independence, the Mali newly independent government assumed that a sovereign state must control its economic growth; it then kept all the colonial texts (Le Bris et al. 1982). The new government gradually disposed of customary rights, especially in practice and often through inconsistent regulatory measures. The evolution of regulation related to agricultural land in the post-colonial period is divided into three main stages. The first stage was characterized by the state's absolute monopoly on land management. The second stage maintained the state monopoly and allowed local stakeholders to manage natural resources and customary rights recognition. The continuity of previous guidelines from the colonial tenure systems predominantly characterized the third stage. It incorporated colonial texts largely, and, on the other hand, it maintained some essential elements from conventional systems (Guengant et al. 2003). Accordingly, after independence in 1960, the newly independent Malian State concluded that all types of land utilization remained provisional and revokable by the government anytime.

Moreover, the advent of democracy in 1992 instituted new approaches to the government's attempt to reform land ownership. Another law, the Code Domanial et Foncier (CDF), or Land Law, was passed in 2000. Innovative components of this law echoed devolution and decentralization approaches by confining rights to centralized local government bodies to handle their properties. Even so, the state reiterated its power to control land or all public realms, including airspace, property, and sub-soil reserves (Lorenzo et al. 2004). Regarding women's tenure rights, independent Mali's secular state has demonstrated increasing help by enacting laws and strategies advocating for gender equality. This is evident in the nation's constitution, which grants equal rights and opportunities to all its citizens. In addition, the CDF grants males and females equal entitlement in possessing title deeds. More importantly, the Loi d'Orientation Agricole (Agricultural Orientation Law) was enacted in 2006. It guarantees the advancement of equal rights and opportunities between men and women in the agricultural realm through assisting and supporting the innovation and institutionalization of modernized farming practices for vulnerable groups, mainly women and youths, in farmed exploitation in rural areas.

However, Islamic culture also weighs against women's tenure rights as around 90% of Mali's population is Muslim. In regions where Islam is highly practiced, such as in the northern part of Gao, Mopti, and Timbuktu, access to land is governed by Shariah's prescriptions or according to local customs and traditions. In Islam, the land is considered a sacred trust whose supreme ownership belongs to Allah. Subsequently, land and natural resources are governed by two interdependent principles. Firstly, the unrestricted use of natural resources, which is not the object of any human being's effort, is free and cannot be traded. The second principle is sustainability, under which land belongs to the individual who sustains it (by cultivating it) (Diakite et al. 2004).

Regarding women's access to land in Islamic regulations, they have no restrictions in owning, inheriting, using, or purchasing land. In this vein, women can receive land or property as a dowry or acquire it through inheritance, even though their shares are smaller, generally half that of their male counterparts (Chaudhry 1997). They can also manage and maintain control over their marital household and financial assets through marriage and may continue to do so after divorce or widowhood. More importantly, women can have individual land title deeds or communal lands. These rights are evident in Islamic law, which endorses women's rights to land and property (Haddad et al. 1997). Yet, in Mali, Islamic rights are neither equally incorporated into the state legislation nor applied correctly among people. Sharia laws are commonly misinterpreted by religious leaders who are generally male.

Land insecurity in contemporary Mali mainly originated from the confusion of these three systems, which continually contradicts statutory practices (Djiré et al. 2010). To some degree, the statutory legal guidelines have undertaken traditional and religious systems and patterns that persist in ruling land relations primarily in urban areas (Diallo 1993). In current Mali, traditional, religious, and statutory structures continue to cooperate, establishing legal pluralism. Yet, the boundary between customary and legal systems is often understood with profound ambiguities, conflicts, and complexities.

Subsequently, women's land tenure remains challenging throughout the country. As an illustration, in a survey conducted by the Enquête Agricole de Conjecture (agricultural survey data) in 2012 on the state of agriculture and farmers in Mali, researchers found that men own 84% of farm plots. Of the 16% of women landowners, 40% were in Kayes region, 21% in Koulikoro, 20% in Sikasso, 11% in Mopti, and 8% in Ségou (EAC 2012). The survey further stated that men have five times as many plots at the national level than women. In Kayes, men have twice as many plots as women. This proportion is 5 in the Koulikoro region, 6 in Sikasso, 16 in Ségou, and 10 in Mopti. Although female plot owners hold 16%, it should be noted that women's plots are very small. Male plot owners have an average of more than 2 ha, compared to 0.22 ha for women (EAC 2012).

The EAC data indicates that Malian women make an invaluable contribution to the socio-economic realm of food production. Yet, despite the adoption of countless international conventions and protocols that reaffirm gender equality, discrimination and prejudice impede their empowerment. In almost all farming regions, women still struggle to own agricultural plots as men do. These inequalities can be further understood and addressed by collecting, processing, and analyzing data on gender disparity in the agricultural sector.

B. The Agricultural Orientation Law (AOL) and Its Claim for Women

On August 16, 2006, the Loi d'Orientation Agricole or Agricultural Orientation Law (AOL) was adopted by the National Assembly of Mali to determine and conduct a long-term policy for agricultural development in Mali. The AOL mandates the state to develop and implement agricultural policy in cooperation with local authorities and farmers. As such, it defines and implements a policy to promote development initiatives at the local, regional, and national levels and provides support for the creation of family farming and agro-industrial enterprises. The AOL further aims to promote a sustainable, diverse, modern, and competitive agriculture, placing farmers at the center of the rural development process (Ministère de l'Agriculture 2009). In this approach, the AOL advocates restructuring and modernizing agriculture for medium- and large-scale family farms by increasing their competitiveness and encouraging their integration into the regional economy to boost employment in rural areas. It also intends "to guarantee food sovereignty and drive the national economy to ensure people's well-being" (Article 1).

The Agricultural Orientation Law further aims to empower women in agriculture by paying specific attention to their land ownership needs. Its emphasis on gender represents an opportunity for rural women farmers, as one of its objectives is to promote the economic and social empowerment of women, youths, and men in rural and peri-urban areas. Many of its articles give special attention to women and focus on solidarity, equity, and partnership, which are instrumental in establishing equality in the agricultural sector. The AOL comprises seven sections with 33 chapters and 200 articles. The following are some of the pillars among the 200 articles that directly address women's land ownership and empowerment in the agricultural sector:

Pillar one: Article 8 promotes equity between women and men in the agricultural sector, particularly on family farms in rural areas.

Pillar two: Article 24 favors the settlement of young people, women, and vulnerable groups as farmers by promoting their access to factors of production and by developing special financial mechanisms to support their agricultural activities.

Pillar three: Article 83 ensures equitable access to agricultural land resources for different farmers and promoters of agricultural holdings. To this end, the state facilitates the admission of the greatest number of farmers, particularly women, young people, and vulnerable groups in the state-managed areas.

Pillar four: Article 89 endorses equitable access to land and other agricultural resources for different farmers. In this respect, vulnerable groups, such as women, benefit from positive discriminative measures in allocating plots managed by the government and its institutions (Ministère de l'Agriculture 2009).

The enactment of the AOL represents an important initial step, as it must be applied, with all the challenges involved in implementing the principles that will disrupt patriarchal customs and traditions. This is precisely why it has been supplemented on the one hand by the provisions of the Code Domanial et Foncier (CDF) or Land Law of 2000 (amended in 2002), which includes the recognition of family farms and agricultural enterprise. On the other hand, it involves the Politique Foncière Agricole (PFA), Mali's new agricultural land policy, adopted on December 31, 2014. The new policy should give more relevance to customary rights already recognized by CDF and to decentralization (implemented since 1996) in land management.

In addition to the AOL, the Government of Mali has also adopted legislative and institutional measures for women's empowerment. Mali has ratified several international conventions that have a direct or indirect effect on the status of women. For example, it approved the Protocol of the African Charter on Human and Peoples' Rights (ACHPR). It also fully subscribes to the definition of discrimination based on sex. Article 2 of Mali's Constitution states: "All Malians are born and remain free and equal in rights and duty. Discrimination based on social origin, color, language, race, sex, religion, and political opinion is prohibited." Mali also adopts the gender-responsive planning and budgeting, which seeks to integrate gender concerns into the country's budget management to efficiently allocate resources according to defined needs. It also investigates the financial status of women, men, girls, and boys to improve resource-efficient allocation in all sectors of activity. These laws and policies, mainly the Agricultural Orientation Law, represent a major step towards rural development, particularly promoting rural women (Diallo 2019). The AOL and its regulation reveal provisions promoting gender equality in agriculture. The study will demonstrate how women's land tenure evolved from three different systems and what impact this had on the implementation of the AOL in contemporary Mali societies.

III. Analysis and Discussion

In this section, the members' quantifiable features, such as age, household size, job, marital status, sex, and years spent at school, are briefly explained. Demographic attributes are crucial in assessing how women's land ownership evolved from pre-colonial times to contemporary society. These characteristics are essential in understanding the data provided below. The respondents' demographic features are also vital in comprehending socio-economic data about their access to agricultural resources, mainly land. In this regard,

Table 1 briefly describes the characteristics of the surveyed population summarized in Table 1. The majority (70%) of the respondents were female farmers from cooperative organizations. On average, they were 36 years old, married, with primary-level education. The respondents reside in households comprising at least three individuals.

Table 1: Demographic Features of Sampled Respondents

Variables	Cooperative members			
Age	Max	Min	Mean	S. D
	65	19	36	9.97
Sex	Cooperative members (%)			
Male	30.6			
Female	69.4			
Level of Education in years	Max	Min	Mean	S. D
	5	1	3.15	1.81
Profession	Respondents (%)			
Farmer's members of the coop	70			
Office workers (government officials, NGOS and others)	30			
Household size	Max	Min	Mean	S. D
	13	3	6	2.6
Marital status	Respondents (%)			
Married	87.1			
Single	8.8			
Widowed	4.1			

[Source: Diallo, based on field survey.]

When analyzed by site, the results reveal that small-scale female farmers represent 45% of the active population in Baguineda. Besides their domestic chores, these women are responsible for rice farming, sowing, clearing, planting, weeding, harvesting, stacking, and market gardening, representing 60 to 70% of their daily workload. In comparison, men in Baguineda perform plowing and threshing activities. The same holds in Kati, where small-scale female farmers represent 58% of the active population. In addition to their household activities, they help their husbands grow cash crops and perform marketing activities in family farms. How these women access and own land in the two study sites will be examined in what follows.

A. Women's Plot Rights a Reflection of Pre-colonial Tenure Practices

Land tenure practices originating from pre-colonial times are still applied throughout the southern agricultural regions where the survey was conducted. Under these systems, the conventional actors managing land access remain traditional chiefs or customary families, usually acting as landowners. However, it should be noted that, underneath traditional procedures, access to land for personal ends does not equate to ownership rights over this land. Under this system, the household head maintains supreme decision-making power over land and who can access it. Accordingly, within contemporary tenure practices, several layers of management are recognized as legal in tenure policies that acknowledge multiple intersecting rights over land. One of these rights is classified as a primary right, an individual has supreme decision-making power over land, and a secondary right, which usually grants the right to utilize the land. For example, a woman or young man might have the right to cultivate a plot to meet individual needs. Still, they do not have primary rights over this land as the household head, or traditional commander maintains this privilege. The customary authorities cannot allocate permanent or leasehold licenses to land; only the state holds entitlement to issue title deeds.

Most of the agricultural land in the southern part of Mali is collectively cultivated by family members. The head of the household supervises communal land and manages agricultural work and revenue from the family farm. The farm unit is a family endowment, and it is handled to meet all household members' needs. Private fields are also cultivated according to a schedule that permits individuals to devote two or three days a week to running their plots. In this vein, while individuals (women and men) operate the household plot, they also obtain access to their own personal land, which they can nurture to meet individual needs.

Under this system, women's property rights vary based on numerous features, including their age, marital status, inheritance, and connection with the community. In this regard, women's obligations and rights to land change over their lifetime as defined by their position as married women, singles, grandmothers, and widows. As an illustration, in some rural areas in Mali, mainly in the cotton-producing region, traditionally, females do not have personal access to land. Instead, they operate as workers on their partner's or father's land. When they are about forty years old, following the first grandchild's birth, these women request to be acquitted of their farm duties and take responsibility for looking after their grandchildren. Nevertheless, if a woman becomes a widow, it is accepted that she must take care of her children. In this case, she is granted access to her partner's land till her eldest son can take over.

Customary practices value and prioritize men's access and control over farming and housing land. It is assumed that a household farm controlled by men meets the entire family's demands, so, in this case, it is contended that women do not need access to individual plots. To meet individual needs, women are granted access to the market garden "Nako" in Bambara or the crops from trees (such as shea nuts), which they assemble and process either for selling or domestic consumption. Market gardens are small vegetable gardens found near the homestead, mainly on roadsides or edges of fields. Almost every household in agricultural societies practices market gardening as a supplement to family farm agriculture. Market gardening also supplements the daily household needs of food. Such gardening requires fewer economic resources, using locally available plants, materials, and indigenous farming methods (Diallo 2021). Women are generally engaged in vegetable gardening, which improves domestic and intra-household food security throughout the year. If surplus vegetables and fruits are left, they can also be an income-generating activity for women as they provide them with extra cash to compensate for their household needs.

Consequently, in farming communities of the south, conventional patterns deem men as heads of households and sole providers for the family sustenance needs, as explained earlier. In this way, women are granted individual market gardens to meet their personal needs. They access these respective lands via their husbands (household head) or through the village chief over negotiation with their husbands. Accordingly, a respondent said:

> Land access, let alone its ownership, remains the major concern among smallholder women in our community. This is because men are mostly in charge of land allocation, distribution, and management in both the state-irrigated areas and in the non-irrigated areas that are under the customary leaders' control.[2]

Another interviewee added:

> With the speedy urbanization of Kati county, land access is getting more complicated for everyone, especially women. Our utilization rights, which males ensured through traditional tenure systems, are lessening with men losing their prerogatives on land. As a result, women are generally the most vulnerable and the first to be excluded from farming activities, particularly women from poor households.[3]

Many women respondents still acquire land via traditional practices and inheritance or a mixture of these two in the study areas. Beneath these structures, the fundamental rights to the plot are handed from men to their male inheritors, as highlighted by the respondents. Females usually acquire land via their spouse's lineage and hold an inadequate plot privilege compared to males. Mali's tenure law formally acknowledges customary tenure rights since the government considers traditional heads as guardians of land obtained under tradition. Yet, at the same time, the state remains the legitimate owner of all untitled property. Meanwhile, state laws deliver no apparent entails through which they confirm customary tenancy rights over the vacant or untitled property. The bulk of the population seeks traditional landholdings practices, which remain precarious.

Beyond these challenges, the surveyed women farmers noted that men are more engaged in the lawful processes when required to undertake legal procedures for the formal registration of plots. When their spouses must do it on their behalf, they usually use their names to substitute their wives'. If the husband has multiple wives, when the sons running the farm inherit the land, they might expel any remaining wives who are not their mother. The issue can become conflictual, sometimes involving the courts and expensive legal fees. Some male offspring may also sell parts of the extended family land to rich urban office workers on their relatives' backs. This can often result in family dissolution and conflicts between families and within family members.

Women farmers are traditionally excluded from the formalization process of land access due to the weight of their domestic work and their lack of literacy, information, and financial means. In the two study areas, women are responsible for household chores and care for family members, making it challenging to pursue lengthy administrative procedures. During the interviews, women also pointed out that the legal processes are slow and expensive. They further stated that they are also victims of bidding and corruption. As an illustration, interviewees in Baguineda affirmed that:

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[2] Interviews with Baguineda women's cooperative, February 5, 2020.

[3] Interview with Kati women's cooperative, February 7, 2020.

> Our income from market gardening does not allow us to undertake legal procedures for the formalization of our plot. We daily live from our earnings. For this reason, most of us still rely on customary holding tenure systems although they guarantee lesser rights.[4]

In addition, when women farmers are engaged in legal procedures, they also prefer to indicate their sons' names when their spouses die. As such, one of the interviewees stated that:

> Sons are deemed permissible heirs of the family land. This is a common practice; even when women can acquire land on their account, they tend to pass this right on to their sons. Daughters are regarded as temporary family members since they will be married and leave the parental house following their marriage.[5]

The above accounts demonstrate that small-scale female farmers' access to property rights in Mali remains challenging. Due to the incoherence in legal practices, these obstacles influence conventional procedures that deem men the rightful heirs of household property. On the other hand, they are also due to the precariousness of women's conditions, their lack of financial resources, their lower education level, their lack of information on their rights, and their implication in the discriminatory practices against themselves.

B. Women Plot Rights a Reflection of Post-independent Tenure Practices

Post-independent land legislation in Mali is based on the principles of citizens' equality, state ownership, decentralization, access to the property through registration, title deeds to land, and recognition of customary rights (Coulibaly et al. 2004). Land represents a symbolic legacy whose utilization remains a factor of unity and social cohesion in Mali. It is one of the foundations of societies' organization at the village level. The land is also an essential financial and symbolic means of production, sharing, and consumption between households and the community.

Land acquisition is done in two ways in Mali whether you are in a managed area such as the Office du Niger (ON), the Niger office; the Office de Developpement Rural de Selingué (ODRS), the rural development office of Selingue; or the Office des Périmètre Irrigué de Baguineda (OPIB), the irrigated perimeter of Baguineda, or in a non-managed area, which is not supervised by any organism. Managed areas are generally areas where intensive farming is practiced, especially rice and extensive market gardening. In contrast, the non-managed areas are lands intended for dry cropping—millet, sorghum, and peanut. The delivery of the land acquisition act is the responsibility of the locality. The managed area is under the state's authority through technical services and managerial organizations (ON, ODRS, and OPIB).

On the other hand, in a non-organized area, the prefect, the mayor, and the customary chief may issue plots. So, in contemporary Mali, all lands belong to the state. However, in keeping with traditional norms, land use is managed by the village or customary chiefs within their collective territorial boundaries—reflecting a dual land administration system. As highlighted earlier, traditional leaders can enjoy land by

[4] Focus group discussions with women's cooperatives in Baguineda, February 7, 2020.

[5] Interview with Kati women's cooperative, February 5, 2020.

cultivating it, using its fruits or trees, or attributing it to newcomers without a definite ownership title. The final allocation of the land belongs to the state.

Regarding women's land ownership in the post-independent era, it is important to highlight that women's property rights and control are not homogenous in Mali. An individual's gender, status, education, financial means, and location impact their property rights. Accordingly, urban areas have no discriminatory gauge for housing plots; the sole challenge remains women's financial ability to buy them, which generally remains lower than men's. In the northern regions of Gao, Timbuktu, and Kidal, where immense land exists, the plot goes to the entity that wishes to farm it. Women farmers in the northern regions meet no challenges in acquiring farming land. Both men and women hold equal access to land since very few individuals practice agriculture. Once an individual obtains land, they can pass it to their offspring. Women usually derive their income from handicraft works and livestock breeding in the north.

Moreover, the surveys found a couple of interesting issues concerning women's land acquisition in managed and non-managed areas. In managed areas, women farmers are excluded or have limited access to plots due to prejudices about their ability to exploit land efficiently and their lack of financial resources. In non-managed areas, female farmers own a few plots of land at the edge of a village or near their husbands' fields. In contrast, men are allotted reasonable-sized plots to produce various crops (rice, millet, sorghum, sugarcane, etc.) while women cultivate small, less lucrative fields for market gardening purposes.

Among the properties designated as managed, the survey found that most property owners are investors not settled in rural areas, implying that state services allocate lands according to its strategy of promoting agribusiness to foreign and non-rural local investors to the disadvantage of the rural population. It is also essential to highlight the existence of women owners that cultivate large parcels of land by hiring rural farmers. These women come from other cities like Bamako. The communities consider them the new investors responsible for their hardships (social inequality, land confiscation, and paid labor).

To further understand women's land tenure rights in current land legislation, the study assesses their land access and ownership in the two study sites. Regarding their access to property rights in the study areas, respondents were asked whether women and men farmers have equal access to agricultural land. The interviewees gave positive and negative answers. Thirty-seven percent of the respondents in Baguineda disagree that women have equal access to land, while 33% of respondents agree that they do. In Kati, 67% of the interviewees were pessimistic about equal land access, against 63% of negative answers in Baguineda. Overall, 65% of the respondents stated that women's access to property remains a challenge. The results thus indicate that even though most of the active rural population in Baguineda and Kati are women, the bulk of them can only access land through a male relative. Usually, men retain fundamental entitlements over land and its resources. Women still enjoy lesser rights, mainly regarding land privileges and inheritance.

These findings contrast with Articles 8, 24, 83, and 89 of the AOL, which guarantee equitable land access between men and women in Mali. These outcomes also reveal that, while men benefit from land ownership, women only have the right to use or exploit infertile land. Accordingly, most respondents indicated that women have temporary access to unproductive land. Since formal registration of claims over land is more complicated, women frequently attain access to land by securing utilization rights through traditional systems, gifts, or purchases among villagers or their cooperatives. In this vein, a female farmer reported:

> We are never denied access to land, but our threat remains access to land with legal documents and the type of plots we are allocated. We constantly change agricultural fields. Our spouses assign us infertile plots of land, which are difficult to exploit, but, once they are productive, they repossess them.[6]

Another interviewee added:

> Women farmers still encounter dire challenges in acquiring land titles through formal systems in our communities. Most of us poorly understand legal land tenure acquisition procedures due to our lack of education and information about these systems. Even the well-informed ones are constrained financially in tackling these procedures, which remain complicated, expensive, and heavily bureaucratic.[7]

The respondents were also assessed regarding their general knowledge of the Agricultural Orientation Law (AOL) and its provisions towards women. Regarding their knowledge of the AOL, 63% of the respondents affirmed that they had never heard about it. Specifically, the survey found that 40% of the respondents in Baguineda had heard about the AOL compared to 38% of the respondents in Kati. In contrast, 65% of the respondents in Baguineda were not aware of the advantages of the AOL, compared to 67% in Kati. Accordingly, an interviewee stated:

> Before enrolling in the cooperative, I did not know about my rights. Thanks to my involvement in the cooperative, things are positively changing. Now I am knowledgeable about my rights as an individual, and, more importantly, I have gained awareness about the Agricultural Orientation Law that endorses our land tenure rights.[8]

Likewise, another respondent alleged:

> Joining cooperatives was like uncloaking and openly gauging opportunities and consolidating ourselves. It allowed our members to strengthen their skills and knowledge about their rights. We benefit from training programs in adult literacy, capacity building, and awareness-raising about our land prerogatives in the AOL. This knowledge is crucial for our personal growth and economic activities.[9]

Though joining cooperatives is providing women with some knowledge about their individual rights and land tenure entitlements within contemporary tenure policies, more than half of the respondents in both areas claim that women still do not enjoy the same land ownership advantages as their male counterparts. In compliance with the pillars of Articles 8, 24, 83, and 89 of the AOL, human rights legislation, and the Mali constitution, men and women remain equal in accessing agricultural resources. Following the exclusion of

[6] Focus group discussions with Kati cooperative members, February 14, 2020.
[7] Interview with Baguineda cooperative members, February 12, 2020.
[8] Interview with Kati women's cooperative, February 10, 2020.
[9] Interview with Baguineda women's cooperative, February 12, 2020.

small-scale female farmers in land allocation, the AOL, which was enacted in 2006, stipulates in its Articles 24 and 83 that women, young people, and vulnerable groups must be granted agricultural land. Approximately 15% of the farming land should be allocated to them on any surface managed by the state and its circumscriptions. In addition, Article 8 of the same text promotes gender equity in rural areas, particularly on the family farm. Article 89 also endorses equitable access to land and other agricultural resources to women, who will benefit from positive discriminative measures in allocating plots managed by the government and its institutions. Yet, the respondents contended that neither the constitution nor the AOL fully instigated equal land rights between the sexes. Accordingly, a respondent claimed:

> Even though Mali's Agricultural Orientation Law foresees positive discrimination for women, the challenge remains the implementation of this law. None of the articles of the AOL are effectively enforced regarding women's empowerment in owning farming plots in state-managed areas.[10]

Another interview added:

> One of the purposes of our cooperation is to address the discriminatory challenges regarding our tenure rights. Much of our members' activism has been about strengthening women's land rights and access to finance. Within our cooperative, women have become more vigorous and informed about their rights, steering to empowerment pursuits through joint action.[11]

> Women's lesser access to formal plots through statutory regulations persist not due to the existence of rights protecting them, but they rather continue because of the non-application of these rights by those who are supposed to implement them. There is a lack of political will to fully enforce laws and policies about women's socio-economic empowerment in Mali.[12]

Despite considering the interests of women and young people as farmers, there is a shortcoming in implementing gender equality in the AOL. Articles 8, 24, 83, and 89, which deal with women's land ownership issues and access to other farming outputs, do not include specific provisions or perspectives for women. In addition, the question of fair representation of women in the mechanisms used to update, monitor, and evaluate the law is not fully addressed. Hence, policies promoting gender equality in the AOL are not fully implemented in rural areas, as some interviewees mentioned. Seventy percent of the women stated that they do not know the legal requirements in claiming their land rights. In other words, the legislative and regulatory guidelines, and other texts on land administration in Mali, are unknown to the rural population. This lack of knowledge is explained by their illiteracy, lack of awareness of the texts, lack of representation in land committees, and lack of information and awareness-raising mechanism on adequate procedures for holding land in rural areas. As a result, awareness-raising mechanisms on the laws guaranteeing women's

[10] Interview at the Ministère de l'Agriculture, February 2, 2020.

[11] Focus group discussions with Baguineda women's cooperative, February 12, 2020.

[12] Interview at the Ministère de l'Agriculture, February 2, 2020.

entitlement to land remain a challenge for small-scale female farmers and the state. Land legislation proposed by the post-independent state is neither applied fully nor applied in some situations as it remains complicated.

Conclusion

Enormous misunderstanding encompasses land tenure regulation and administration in Mali. Although this might have several causes, one of the main reasons is the disjuncture between the customary tenure practices of pre-colonial times and the various land laws introduced by the colonizers that denied pre-colonial tenure practices. The colonial tenure practices were sustained by post-colonial Malian governments emphasizing decentralization and private property rights following independence. Yet, traditional land tenure systems that date back to pre-colonial times are still utilized. Over time, both structures have changed substantially to the extent that land ownership practices in Mali lack effective incorporation of customary and statutory rules and procedures. Consequently, the public weakly understands land tenure policies and systems. Under both structures, women's land ownership is still challenging.

Given the prominent role of women in agriculture, which is essential for economic growth and poverty reduction in Mali, the paper concludes that previous efforts to revive the agricultural sector through the enactment of the AOL have been insufficient. This insufficiency is partly due to the low percentage of managed agricultural lands allocated to female farmers. Women's lack of land ownership is also explained by the presumption of their inability to produce efficiently and their financial constraints. Lastly, small-scale female farmers' utilization as laborers in the managed areas of national and international investors and the unawareness of women farmers of their land rights as well as their barriers to accessing essential services remain crucial challenges to their land ownership. It is evident from the preceding assessment that the reasons mentioned above maintain women in a vicious cycle of precariousness regarding their land ownership. It thus remains essential to address the inadequate application of the AOL provisions in the managed areas and the allocation of plots to rich investors who threaten the equilibrium and livelihood of rural farmers. Supporters of women's rights should devote enough time identifying community patterns and regulations while collaborating with small-scale female farmers, state, customary and religious leaders to harmonize statutory laws with conventional practices, develop rules for crucial adjustments, and create practical resolutions.

This article suggests enforcing the AOL implementation in state-managed areas while strengthening small-scale women farmers' capabilities, which remain necessary for their socio-economic empowerment in the agricultural sector. Ensuring women farmers' capacity building would enable them to confront inequalities in the distribution of resources, acquire more skills, abilities, and experiences through training, and receive information on their rights as well as new agricultural technologies. This will also allow them to develop leadership skills in attaining decision-making stances where their access to essential agrarian resources is discussed. In contribution to the existing literature on women farmers' access to land in Mali, any policy or development program seeking to improve women farmers' living conditions in the agricultural sector should consider the challenges and recommendations made in this study.

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Analysis of International City-Pair Markets in the Air Transport of Kyrgyzstan: A Special Focus on Airline Competition

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Abstract

Based on the global consensus on the significance of air transport, a more detailed analysis has been made by some scholars regarding the effects of promoting liberalization, which presumes the presence of competition in the air market. Many scholars have pointed out that competition is the most effective instrument for promoting market processes through encouraging players to improve service quality and technologies and offer consumers a greater choice of services for fair prices. Therefore, Kyrgyzstan, one of the low-income landlocked economies in CIS, which has faced the challenges of having the lowest index in air transport infrastructure, has attempted to improve competitiveness in air transport by introducing some degree of air service liberalization. However, there is debate among policymakers and practitioners of Kyrgyzstan's air transport. Some policymakers have argued that liberalization would destroy the national airline industry as Kyrgyz national airlines are not very competitive. Others have insisted that air liberalization is a key for the development of air transport, including the national airline industry. Therefore, the question remains: which argument is legitimate? This article is a partial research study of an unpublished doctoral dissertation (Beishenaliev 2021). Among different aspects of the impacts of liberalization, this study evaluates the ability of Kyrgyzstan's national airlines to compete with foreign airlines. By analyzing Kyrgyzstan's case, this study measures the competitiveness of national airlines in the Eurasian market. For this purpose, the author employs quantitative analysis. This methodology includes two approaches, namely, the Herfindahl-Hirschman Index (HHI) and the four-firm concentration ratio (CR4) tool. The major source of the data is the Civil Aviation Agency of the Kyrgyz Republic, the most significant stakeholder of Kyrgyz aviation operations. I analyzed the primary data on air passenger traffic to and from Kyrgyzstan carried by foreign and national airlines between 2015 and 2019. The significance of this study is that it is the first research examining the level of competitiveness of national airlines in Kyrgyzstan. One of the study's findings showed that Kyrgyzstan's airline market is highly concentrated among a few dominant airlines in the market and belongs to a tight oligopoly or duopoly. Moreover, the study demonstrated that all national airlines in the Eurasian market face extremely poor competitiveness due to their market shares. Therefore, I emphasize policy recommendations to mitigate the risks that the government's reform of air service liberalization would bring about.

Keywords: air service liberalization, airline market, competition, concentration

I. Introduction

Following globalization trends, air transport has become the key means of transportation that connects international markets globally. It plays an essential role in connecting states into global markets through an extensive flight network and improved air connectivity in a timely and effective way. As globalization has expanded, air traffic has doubled every fifteen years and continues to grow. According to the International Air Transport Association (IATA 2020, p. 15), air passenger traffic has reached about 4.53 billion passengers worldwide, and around 60.9 million tons of freight were carried by air transport globally in 2019. This traffic includes tourists, labor, investors, businesses, commodities, and goods.

As many developing countries have recognized the significance of air transport for economic development, they have attempted to deregulate their market entry barriers to promote airline competition over the last several decades (Arvis et al. 2011, p. 44). This deregulation is generally called air service liberalization. Air service liberalization is a process of entering into air service agreements characterized by freer market access, minimal airline capacity regulation, and significantly reduced governmental controls on airline pricing (ICAO 2018).

Among states that have introduced air liberalization, Kyrgyzstan, a landlocked developing economy, has attempted to reform its air transport industry by introducing some degree of air service liberalization. In this regard, it should be noted that there is debate among policymakers and practitioners of Kyrgyzstan’s air transport. Some policymakers have argued that a high level of liberalization would destroy the national airline industry through increased airline competition. They believe that the national airlines are not capable of competing with much stronger foreign airlines in the Eurasian market (CABAR 2019; Fergana News 2019). Others have insisted that a liberalization policy is a key to the development of the country’s air transport and the growth of national airlines through cooperation arrangements (MOE and GIZ 2014, p. 41). However, the impact of liberalization policies has not been assessed. Among different aspects of the impacts of liberalization, this study evaluates the ability of Kyrgyzstan’s national airlines to compete with foreign airlines. Therefore, the question of whether the above-mentioned arguments are legitimate remains.

This study aims to assess the competition of airlines operating in Kyrgyzstan. To fulfill this objective, the author examines the level of competitiveness of Kyrgyzstan’s national airlines.

For this purpose, this study employs a quantitative method of analysis. This methodology includes two approaches. One is the Herfindahl-Hirschman Index (HHI) to measure the competition level of the markets. The other is the four-firm concentration ratio (CR4) tool. By so doing, I analyze primary data on the performance of arriving and departing air passengers to and from Kyrgyzstan carried by foreign airlines and Kyrgyzstan’s national airlines between 2015 and 2019. The data source is published by the Civil Aviation Agency of the Kyrgyz Republic.

Following the introduction section is an overview of the background of the study. The level of airline competition of city-pair markets in Kyrgyzstan is then examined to identify airline market structure. By so doing, this study examines the market power of Kyrgyzstan’s national airlines. The final part of this article provides concluding remarks on this research.

II. Background of the Study and Literature Review

(A) Background of the Study

Fifteen airlines are operating in Kyrgyzstan internationally: two national and thirteen foreign. Figure 1 shows the airlines operating in Kyrgyzstan internationally and their share in the country's passenger traffic in 2019. The national airlines, Avia Traffic Company and Air Manas, served around 22% of the total international traffic in Kyrgyzstan, while foreign airlines served about 78% of passenger traffic; they significantly dominate Kyrgyzstan's air transport.

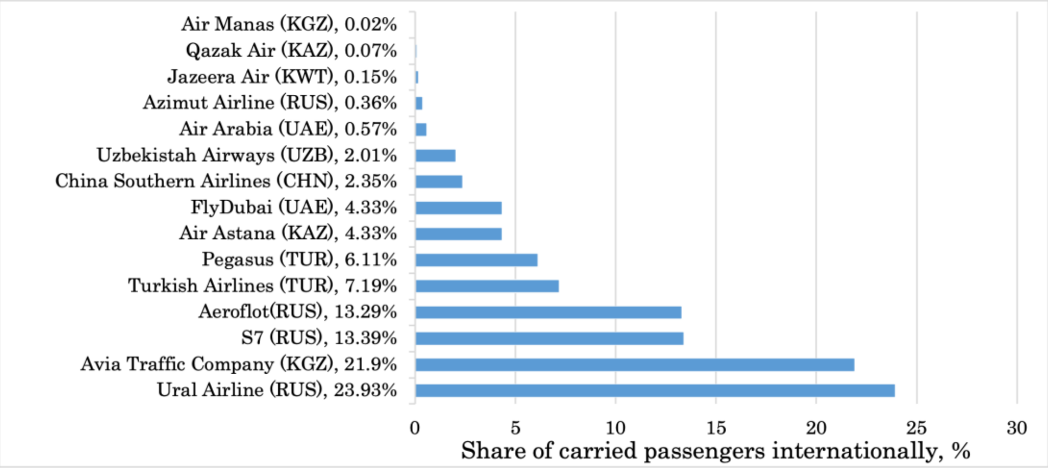

Figure 1. Share of domestic and international airlines in international air passenger traffic of Kyrgyzstan for 2019

Note: CHN – China, KAZ – Kazakhstan, KGZ – Kyrgyzstan, KWT – Kuwait, RUS – Russian Federation, TUR – Turkey, UAE – United Arab Emirates, UZB – Uzbekistan.
[Source: Beishenaliev, based on air traffic data from the Civil Aviation Agency of the Kyrgyz Republic for 2019 (CAA 2019).]

The leading international airlines present in Kyrgyzstan are Turkish Airlines, China Southern Airlines, Aeroflot Russian Airlines, Air Astana, and S7 Airlines (IATA 2020, pp. 17-19). Table 1 demonstrates the capacity of foreign airlines and Kyrgyzstan's national airlines that operate international flights in Kyrgyzstan, namely the data on air fleets and the number of air routes in operation for January 2022, along with the service quality they provide for air travelers.

Table 1. Data on Aircraft, Air Routes, and Service Quality of Airlines Operating in Kyrgyzstan (2022)

Airline	Number of aircraft	Fleet average age	International routes	Domestic routes*	Total routes	Rating** (service quality)
China Southern	661	8.3	38	> 400	> 400	74%
Turkish airlines	314	7.3	> 300	114	> 400	88%
Aeroflot	189	6.1	133	126	159	84%
S7	119	9.4	104	> 130	230	84%
Pegasus	87	4.9	96	59	155	72%
Flydubai	61	5.2	90	-	90	71%
Ural Airlines	58	13.4	146	30	176	73%
Air Arabia	48	6.4	71	-	71	76%
Uzbekistan Airways	40	10.8	33	9	42	73%
Yamal	35	11.8	1	34	35	69%
Air Astana	32	3.4	33	27	60	89%
Jazeera Airways	17	5.8	33	-	33	59%
Azimuth	15	3.8	21	86	107	95%
Avia Traffic Company	6	27.7	15	1	16	47%
Qazaq Air	5	4.9	4	16	20	n/a
Air Manas	1***	2	2	1	3	67%

Note: * Domestic air routes in the country of the airline's registration.
** Rating of airlines (boarding/deplaning, flight crew, in-flight service, in-flight entertainment, WiFi) based on the reviews from Flightradar24 users who have traveled with these airlines.
*** Air Manas purchased one new Airbus A220 aircraft in 2021.
[Source: Beishenaliev, based on data on the selected airlines (from https://www.flightradar24.com/data/airlines, accessed January 19, 2022) and data on the fleet age (from https://www.airfleets.net/ageflotte/fleet-age.htm, accessed January 19, 2022).]

As shown in the table above, China Southern Airlines, Turkish Airlines, Aeroflot Russian Airlines, and S7 Airlines are the biggest airlines flying to Kyrgyzstan. They operate air fleets of more than a hundred aircraft each. China Southern operates their air fleet of 661 aircraft to run a flight network of more than 400 domestic and international air routes in China. S7 Airlines operates 119 aircraft to service 230 air routes connecting Russian cities domestically and internationally.

In contrast, Kyrgyzstan's national airlines have the poorest capacity of those flying to Kyrgyzstan. As shown in Table 1, Kyrgyzstan's airlines are among the most minor airlines in terms of air fleet size and number of total city-pair routes in operation. Air Manas operates one Airbus 220 aircraft only, flying two international air routes and one domestic. Avia Traffic Company operates six aircraft, flying fifteen international routes and one domestic.

Furthermore, Kyrgyzstan's biggest national airline, Avia Traffic Company, is the poorest airline in terms of air fleet age and service quality. As demonstrated in Table 1, the airline operates the oldest air fleet in Kyrgyzstan's city-pair routes. The airline's average aircraft age is 27.7 years. Furthermore, Avia Traffic Company is considered to be the worst among the airlines operating in Kyrgyzstan in terms of airline service quality. Flightradar24 (2022) ranked Avia Traffic Company at 47%, from least to best airline service. This ranking is based on the travelers' reviews on the airline's boarding/deplaning, flight crew, in-flight service, in-flight entertainment, and WiFi service. In comparison, Ural Airlines, leading in terms of passengers carried in Kyrgyzstan, is ranked in the top 73% of best service (Table 1); it provides air travelers with about

34% better service than Avia Traffic Company.

As demonstrated above, the country's national airlines are much weaker than foreign airlines in terms of fleet capacity, city-to-city air operations, and service quality. In theory, this makes Kyrgyzstan's airlines less competitive than other players in the market. However, what is the role of the country's airlines in international air transportation in Kyrgyzstan?

As illustrated in Figure 1, a national airline is the worst-performing airline. Air Manas served only around 0.02% of total international traffic in 2019. This can be explained by the fact that this airline suspended its operations due to the loss of the only aircraft it had by the end of 2019. Air Manas has purchased one new airliner only by 2021.

On the other hand, the other national airline that also faces poor fleet capacity and service quality, as demonstrated earlier, is among those that dominate the market. Avia Traffic Company is the second-biggest airline in terms of passengers carried in Kyrgyzstan. It served 21.9% of the total international traffic in Kyrgyzstan in 2019. This trend can be explained by the restrictive nature of the bilateral air service agreements Kyrgyzstan has (Beishenaliev 2020). In particular, restrictive air service agreements in most cases have protected national airlines since 1991 by imposing barriers on foreign airlines. This practice has limited foreign airlines' entry into Kyrgyzstan's air service market and has led to the limitation of air service capacity[1] for both national and foreign airlines.

Therefore, there are two different factors that influence the national airlines' operations. One is a correlation between the airline's fleet capacity and its operational performance. The other is the effect of restrictive agreements on the market share of national airlines.

However, as shown in Figure 1, thirteen foreign airlines have kept their services to Kyrgyzstan. Among them are three Russian airlines, namely Ural Airlines, S7, and Aeroflot, which handled about 50.61% of the total air passenger traffic in Kyrgyzstan in 2019. This means that Russian airlines have a dominant presence.

Figure 2 illustrates Kyrgyzstan's air passenger traffic demand by destination for 2019. The majority, about 70%, of Kyrgyzstan's air traffic is linked with the Russian Federation. Following Russian destinations, there is a high demand for air travel to Turkey. A total of 15% of the air passenger traffic of Kyrgyzstan is demanded to Turkey's airports. Passenger traffic to the United Arab Emirates is about 5%, as to Kazakhstan. The share of Kyrgyzstan's air traffic to China and Uzbekistan amounts to about 2% for each country. Other destinations account for around 1% of the total air traffic of Kyrgyzstan.

[1] Example: parity in transportation, frequency, and seat capacity.

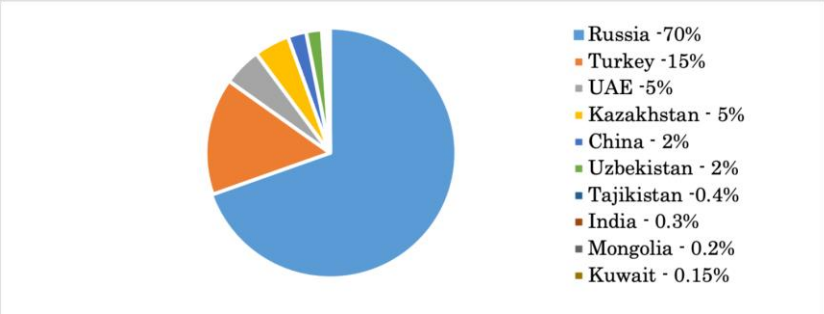

Figure 2. Kyrgyzstan's air passenger traffic demand by state (2019)

[Source: Beishenaliev, based on air traffic data from the Civil Aviation Agency of the Kyrgyz Republic for 2019 (CAA 2019).]

Unfortunately, Kyrgyzstan is poorly connected by air internationally. Figure 2 demonstrates that the country is linked by air transport to only ten states in CIS, the Middle East, and Asia. Furthermore, the WEF (2019) ranks Kyrgyzstan as 117th out of 140 countries worldwide in terms of the Air Transport Infrastructure Index. Notably, Kyrgyzstan has the worst performance of air transport infrastructure in Eurasia. This index evaluates to what extent a country offers adequate air connectivity for air travelers to, from, and within the country. In particular, the WEF's air transport infrastructure index measures the quality of air transport infrastructure, available seat kilometers, number of aircraft departures, airport density, and number of operating airlines in the country (WEF 2019, p. 97).

As demonstrated above, only two national air carriers are present in international air transport in Kyrgyzstan, and the capacity of foreign airlines is much stronger than Kyrgyzstan's. However, what is the competition level among the airlines operating in Kyrgyzstan, and how competitive are Kyrgyzstan's national airlines? The following will first develop the methodology from a literature review.

(B) Literature Review

The terms "competition" and "competitiveness" are often used in economic studies. According to Stigler (1988, pp. 531-536), "competition is a rivalry between individuals (or groups or nations), and it arises whenever two or more parties strive for something that all cannot obtain." Competition is the most effective instrument for promoting market processes through encouraging players to increase service quality, improve technologies, provide greater choice of services, and offer fair prices. Competitiveness, therefore, is the ability to attract consumers by a combination of economic, technical, and qualitative characteristics in a market.

Indeed, the industry characteristics regarding the number of players and their behavior in the market determine the market structure. Grant (2008) classifies markets into four categories: pure competition, oligopoly, duopoly, and monopoly. Table 2 demonstrates this classification by showing critical market characteristics, such as the number of airlines in the market, market entry barriers, product diversification, and availability of information.

Table 2. Market Structure Characteristics

	Perfect competition	Oligopoly	Duopoly	monopoly
Concentration	Many companies	Few companies	Two companies	One company
Entry and exit barriers	No barrier	Significant entry barriers		High entry barriers
Product diversification	Homogeneous product/service	Potential for product diversification		
Accessibility to information	No barrier to follow of information	Access to information is limited		

[Source: Grant 2008; Yaşar et al. 2017b, p. 4.]

As presented in Table 2, a market with perfect competition is defined as a homogeneous market (air traffic demand) that is divided between many air carriers that have open access to needed information and can easily enter or exit the market. Oligopoly and duopoly markets are characterized by significant barriers to market access that result in a limited number of carriers. In an oligopoly, a few companies dominate the market, and there are only two dominating carriers in a duopoly.

Markets with high entry barriers in which one airline shares most air passengers belong to a monopoly. What unites oligopoly, duopoly, and monopoly is that these markets have limited access to information and uneven market diversification, and where most shares are concentrated to a few, two, or one individual airline accordingly (Table 2).

In this article, the term “concentration” refers to a market condition where a large share of economic activity is dominated or controlled by a small number of firms (Yaşar 2017). As shown in Table 2, concentration varies depending on the competition level and market structure.

In this context, market concentration is utilized as one of the measures to evaluate the competition level in the market. Through measuring the market concentration, one can infer the overall market structure and power of specific players in it. Indeed, there are various methods for determining market concentration. However, there are many studies that have indicated the advantage of the use of specific concentration indexes, namely the HHI and CR4, in analysis.

There is ample literature showing the applicability of the HHI and CR4 methods in the analysis of air transport. For example, Lijesen et al. (2002) measured two city-to-city air markets, Paris-New York and London-New York. Lijesen et al. argue that the HHI and CR4 indicators react in the same way to the same events. However, while the CR4 index can notice shifts of power among the top four firms in the market, the HHI shows closest to economic intuition by demonstrating the market share of each firm competing in the market. Along with this outcome, Lijesen et al. recommend using several competition indicators simultaneously to ensure the robustness of results.

Johnston and Ozment (2011) measured airline concentration in the US market between 1970 and 2009 by using the HHI and CR4 tools. The study results demonstrate that airline competition had increased under US airline market deregulation, but that the airline industry remained more concentrated than before airline deregulation.

Regarding the empirical application of concentration indexes on the global airline market, Yaşar et al. (2017a) examined the competition level of the world airline market of seven world regions, namely Asia Pacific, Australasia, Eastern Europe, Latin America, Middle East-Africa, North America, and Western Europe. This study utilized the CR4 and HHI to determine the competition level of certain world airlines between 2006 and 2015. The findings of this study demonstrate that a significant part of the HHI indexes of these seven world regions are below the critical level (HHI of 1,000), meaning the world airline market structure is generally found to be competitive.

Similar to world air transport analysis, Yaşar et al. (2017b) employed the HHI and CR4 indexes to examine the airline competition in Turkey's domestic airline market. Yaşar et al. measured the competition level of air operators at the country's top five airports by year. The study's results demonstrated that, along with air traffic growth in Turkey, the defined HHI index of most domestic air routes ranged within a high level of market concentration structure from 2012 to 2015. Therefore, in the case of market concentration analysis of Turkey's city pairs, this study justifies the idea that the domestic airline market is far from competitive in Turkey and provides recommendations and determinations for improving competition.

Among the studies, Naldi (2014) investigated the relationship between the HHI and CR4 tools and found them to be the best way to examine industries, including air transport.

Therefore, I use the HHI and CR4 tools to measure competition in Kyrgyzstan's air transport. The following section will describe the estimation methodology of the HHI and CR4.

III. Estimation of City-Pair Market Concentration in Kyrgyzstan

(A) Methodology for Estimating Market Concentration

(1) The Herfindahl-Hirschman Index

The HHI is a statistical measure of concentration that can be used in a variety of contexts and disciplines (Rhoades 1993). The concentration index is calculated by summing the squares of the market share of each firm competing in the market. The formula of the HHI is as follows:

$$(1) \quad HHI = \sum S_i^2$$

where S_i is the market share of the i-$1 \dots n$ firm in a given market. [Example of computing the HHI for five firms that are equally represented in the market: $HHI=(20)^2+(20)^2+(20)^2+(20)^2+(20)^2=2{,}000$]

The HHI value indicates the level of concentration. The maximum value of concentration corresponds to a monopoly case with a high market concentration in the hands of several firms and a lack of competition. The minimum HHI value refers to the case of perfect competition. Hence, the HHI can be interpreted as in Table 3.

Table 3. HHI Value and Competition Level

HHI value	Competition Level
0-1500	Non-concentrated markets
1500-2500	Moderately concentrated markets
2500-10000	Highly concentrated markets

Note: HHI value calculated for market shares expressed as percentages.
[Source: Naldi 2002, p. 3.]

(2) The four-firm concentration ratio

The CR4 method analyzes the market concentration, just like the HHI. However, while the HHI studies the share of all market players, the CR4 examines the share of the top four firms to investigate the level of concentration and competition level in the market. This index is computed as the sum of four firms with the largest market shares in the market, as in the formula below:

$$(2) \quad CR4=\sum S_i,$$

where i=1…4.

As in the case of the HHI, the lower the value of the CR4, the lower the concentration and the higher the level of competition in the market. In contrast, a higher value demonstrates an oligopoly market structure, as in Table 4.

Table 4. Levels of Competition and CR4 Values

CR4 value	Competition Level
0	Perfect Competition
0–40	Effective Competition or Monopolistic Competition
40–60	Loose Oligopoly or Monopolistic Competition
60-100	Tight Oligopoly or Dominant Firm with a Competitive Fringe

[Source: Naldi 2002, p. 3.]

(B) Analysis

This section demonstrates the computing study of HHI and CR4 concentration indexes for airlines operating in Kyrgyzstan to identify the level of competition in the country’s air transport. The data source is the Civil Aviation Agency of Kyrgyzstan. The primary data includes the performance of arriving and departing air passengers to and from Kyrgyzstan, carried by foreign airlines and Kyrgyzstan’s national airlines between 2015 and 2019.

Using the data for each international air route of Kyrgyzstan from 2015 to 2019 and through calculation model (1) for HHI and model (2) for CR4, the airline concentration in the city-to-city routes is calculated. The calculation results of the HHI and CR4 indexes are summarized in Appendix 1. Based on the results of market concentration calculation, Table 5 describes the trends in airline concentration of city-pair markets in Kyrgyzstan internationally between 2015 and 2019.

Table 5. HHI Value Ranges of International City-Pair Markets (2015-2019)

Market concentration	**HHI value**	City-pair markets in operation				
		2015	2016	2017	2018	2019
Low Concentration	0-1500	-	-	-	-	-
Mid- Concentration	1500-2500	2	-	1	-	-
High Concentration	2500-3000	-	2	2	1	1
	3001-4000	1	2	1	2	1
	4001-5000	3	2	-	-	1
	5001-6000	8	5	4	5	1
	6001-7000	-	3	6	1	2
	7001-8000	-	2	2	1	2
	8001-9000	1	1	1	2	1
	9001-10000	23	18	16	24	27
Total city-pair routes		38	35	33	36	36

[Source: Beishenaliev, based on data on the HHI for Kyrgyzstan's city-pair markets from Appendix 1.]

As shown in Table 5, two city pairs were found to be mid-concentration markets, ranging between 1,500 and 2,500 (5%). A total of 36 out of 38 city pairs in operation in 2015 were identified as highly concentrated markets (95%). Along with this, among the 36 highly concentrated city-to-city routes, 23 city-pair markets were identified as the most concentrated with HHI values ranging between 9,001 and 10,000 (64%).

When the HHI values are examined for 2016, it is seen that all 35 city-pair markets are highly concentrated (100%). A total of 18 out of 35 city pairs are the most concentrated (51%). When the year 2017 is taken into consideration, one out of 32 city-pair markets is defined as a mid-concentrated market (less than 1%). However, 16 out 32 highly concentrated city-pair markets are found to be most concentrated, with an HHI ranging between 9,001 and 10,000.

In 2018, all 36 city-pair markets were found to be highly concentrated (100%). Twenty-four city-pair markets were identified as most concentrated, with an HHI between 9,001 and 10,000 (48%).

Analysis of HHI values for 2019 demonstrated that a similar situation had been observed in the previous year. The HHI values of all 36 city pairs in operation indicate high market concentration. It is also observed that 27 out of the 36 city pairs are most concentrated, with HHI values ranging between 9,001 and 10,000 (75%). This is also the case for the CR4 values.

As demonstrated in Table 6, the CR4 values of almost all international city-pair routes in Kyrgyzstan between 2015 and 2019 range between 91 and 100. Hence, this analysis identified Kyrgyzstan's city-pair markets as the densest of highly concentrated markets.

Table 6. CR4 Concentration Value Ranges of International City-Pair Markets (2019)

Market concentration	CR4 value	City-pair markets in operation				
		2015	2016	2017	2018	2019
Low Concentration	0–40	-	-	-	-	-
Mid- Concentration	40–60	-	-	-	-	-
High Concentration	60-70	-	-	-	-	-
	71-80	-	-	-	-	-
	81-90	2	-	-	-	-
	91-100	36	35	33	36	36
Total city-pair routes		38	35	33	36	36

[Source: Beishenaliev, based on data on the HHI for city-pair markets in Kyrgyzstan from Appendix 1.]

Therefore, the HHI and CR4 value trends for Kyrgyzstan's city-pair markets for 2015-2019 demonstrate that the airline market concentration increased with a shift towards the most concentrated. As a result of the HHI and CR4 analysis, it is seen that the structures of most of the city-pair markets in Kyrgyzstan belong to a tight oligopoly or dominant firm with a competitive fringe (Appendix 1).

The information obtained from the HHI and CR4 indexes demonstrates the overall competition trend in Kyrgyzstan's air transport. However, the analysis below reveals the state of competitiveness of Kyrgyzstan's national airlines.

As demonstrated in Appendix 2, the traffic and market share of Kyrgyz airlines decreased from 2015 to 2019.[2] On the other hand, as shown in Appendix 2, the total air traffic served both by Kyrgyz airlines and international airlines grew in the same period.

Then, what was the level of air operations in high-demand city pairs between Kyrgyzstan and international airlines in the same period? In the case of Kyrgyzstan, the high-demand city pairs are the air routes connecting Moscow and Kyrgyzstan's cities, Bishkek and Osh. As demonstrated in Appendix 1, the number of national airlines dropped by half. This fact indicates that the market power of national airlines decreased, faced with the dominance of Russian airlines.[3]

[2] While air traffic grew, however, the presence of national airlines decreased in the market from 2015 to 2019. The total number of airlines in Kyrgyzstan's air transport decreased from nineteen in 2015 to fifteen in 2019. Within this period, four new foreign airlines entered the country's air transport market. On the other hand, out of the nineteen airlines that were operating in Kyrgyzstan in 2015, eight airlines left the market. Among those who left the market, two national airlines, namely Air Bishkek and Air Kyrgyzstan, went bankrupt and left the market in 2017 and 2018, respectively. In addition, the market share of Kyrgyzstan's Air Manas fell sharply, by around 99%, between 2015 and 2019. Consequently, the total market share of Kyrgyzstan's national airlines in the market dropped from 35% in 2015 to 22% in 2019.

[3] The changes in Kyrgyzstan's city-pair markets with the highest competition level clearly show that Kyrgyzstan's airlines are significantly inferior to foreign airlines. For instance, in the Osh-Moscow city-pair market, three national airlines left the market by 2016. Along with this, Avia Traffic Company's share in this city pair dropped significantly by 17% in just one year immediately as Aeroflot Airlines entered this air route in 2018. Aeroflot's share increased from 3% to 17% in this period. The same picture was observed in the Bishkek-Moscow air route with the second-lowest market concentration. The number of airlines dropped from six to four due the bankruptcy of Kyrgyzstan's airlines. Meanwhile, Ural Airlines and Aeroflot experienced the most significant increase in passengers carried in the Bishkek-Moscow city pair from 2015 to 2019.

Therefore, the result of this study suggests that Kyrgyzstan's national airlines are less competitive than foreign air carriers operating in Kyrgyzstan's air market. Hence, this study, in the case of estimation of airline competition in Kyrgyzstan, confirms the arguments of the policymakers and practitioners of Kyrgyzstan's national airline industry that a high level of liberalization would destroy the national airline industry, as stated in the introduction of this article.

Regarding how to measure the market competition utilizing micro-data, data on airfare prices is also useful. It is significant to analyze the cost performance of the city-pair markets in the lowest concentration index as well as in the high concentration. First, the average airfare cost on the Osh-Moscow route is about 5.3 USD per 100 km.[4] On the Bishkek-Moscow route, the cost is about 5.8 USD per 100 km. In the Bishkek-Istanbul city-pair market, which is also seeing a significant increase in air passenger traffic and where competition exists (one of the lowest HHI indexes), the cost of a flight is 3.7 USD per 100 km.

In contrast, in the high-demand city pairs that have the highest HHI indexes, the airfare cost is much higher. On the Bishkek-Dubai air route, which has seen a significant increase in passenger traffic (of about 156% from 2015 to 2019), but is operated by the UAE's Flydubai alone, the cost of a flight is about 8.2 USD per 100 km. Also, in the monopoly market of the Bishkek-Kuwait route, the average cost of a flight is 10.5 USD per 100 km. Lastly, the fare cost is about 12 USD per 100 km in the Bishkek-Nursultan monopoly market.

The above-demonstrated comparison of airfares among the city-pair markets with a high HHI and CR4 and those with the lowest concentration values clearly shows that there is a correlation between the competition level and prices that exist in the market. In the city-pair markets with low market concentration, the competition is higher and the price for air travel is much lower than in the monopolistic air routes where only one airline operates the flights.

These competition trends could, in theory, also contribute to the development of national airlines in different ways. First, a decrease in airfares could potentially increase the demand for air transport among the population and travelers. Increased demand in air travel could significantly facilitate passenger traffic growth, and thus Kyrgyzstan's national airlines could benefit through servicing those passengers domestically (using their monopolistic power in domestic routes) and internationally. Second, national airlines could enter the monopolistic international routes and then increase their operations through setting lower airfares, such as in air services to Russia and Turkey. In addition, competition can also force national airlines to improve management efficiency and fleet capacity. Hence, some degree of air liberalization may contribute to air transport development.

In this context, air liberalization could significantly increase competition in the market. By so doing, it can reduce airfares, increase the country's traffic demand, and improve the country's air connectivity. However, as this study argues, there is the peril of Kyrgyzstan's national airlines being driven out the market if a high level of liberalization is implemented there. Therefore, the government should first liberalize air services

[4] The data on the airfare cost for air routes is taken from the web page https://www.aviasales.ru. Only current data is available.

and city pairs with no interest from Kyrgyzstan's airlines. It is advisable for Kyrgyzstan's government to maintain parity and a restrictive approach in air agreements with CIS and Turkey, since Kyrgyzstan's airlines are most interested in and financially reliant on operating these air markets. Otherwise, air service liberalization with these countries may lead to losing the national airline industry completely.

Regarding the capacity of national airlines, the government should rebuild its flag carrier and attract investment to purchase aircraft and improve the quality of service. Moreover, the government should develop and implement a policy for the development of the national airline industry.

IV. Conclusion

This imperative study demonstrated that the international city-pair markets in Kyrgyzstan are highly concentrated among a few dominant airlines and belong to a tight oligopoly or duopoly. This shows that there is extremely poor airline competition in Kyrgyzstan's air transport industry. Along with this, the study found that the national airlines have low capacity, making it difficult to compete with more advanced foreign air carriers.

The study demonstrated the extremely low competitiveness of Kyrgyzstan's national airlines. The analysis of the country's city-pair markets demonstrated that national airlines decreased in 2015-2019; two of Kyrgyzstan's airlines went bankrupt, and one airline was facing pre-bankruptcy conditions. The other finding is that the power of Kyrgyzstan's national airlines is also low; among dominant airlines in the city-pair markets, there is only one national airline versus three more advanced foreign airlines.

I also found that there is a high risk that air service liberalization in Kyrgyzstan could dramatically affect national airlines. Therefore, if market entry barriers are removed under air liberalization, Kyrgyzstan's national airlines could then quit the Eurasian market, and the national airline industry would be destroyed. An increase in the number of more advanced and powerful foreign airlines could simply "smash" the national airlines.

Therefore, the government should carefully decide which air service agreements should be liberalized by creating specific criteria considering the demand for the national airlines. In other words, national competition should be incorporated into such criteria.

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Appendix 1.

Data on Air Passengers Carried and Summary of Calculation of Concentration Indexes in the International City-Pair Markets of Kyrgyzstan for 2015-2019

Table A1-1. Data on Air Passengers Carried and Summary of Calculation of Concentration Indexes in the International City-Pair Markets of Kyrgyzstan for 2015-2019

City-pair markets	PAX*	HHI	CR4	PAX*	HHI	CR4	PAX*	HHI	CR4	PAX*	HHI	CR4	PAX*	HHI	CR4
Bishkek-Baku	3,502	10,000	100	0	-	-	0	-	-	0	-	-	0	-	-
Bishkek-Urumqi	68,331	5,566	100	79,620	4,332	100	66,447	5,318	100	52,865	9,802	100	57,091	10,000	100
Bishkek-Kashgar	0	-	-	2,420	10,000	100	1,122	10,000	100	0	-	-	0	-	-
Osh-Urumqi	11,987	10,000	100	9,351	10,000	100	2,949	10,000	100	2,186	10,000	100	0	-	-
Bishkek-Deli	14,029	10,000	100	23,201	10,000	100	34,392	10,000	100	35,659	8,200	100	0	-	-
Bishkek- Almaty	63,255	8,698	100	54,216	8,528	100	74,051	8,362	100	82,077	8,872	100	87,246	9,042	100
Bishkek-Nursultan	18,277	10,000	100	19,669	10,000	100	26,078	10,000	100	23,719	10,000	100	22,078	10,000	100
Osh-Almaty	0	-	-	0	-	-	0	-	-	0	-	-	826	10,000	100
Bishkek-Kuwait	0	-	-	0	-	-	0	-	-	0	-	-	3,759	10,000	100
Bishkek-Ulaanbaatar	5,992	10,000	100	5,164	10,000	100	5,724	10,000	100	4,870	10,000	100	4,529	10,000	100
Bishkek-Abakan	0	-	-	718	10,000	100	0	-	-	0	-	-	0	-	-
Bishkek-Belgorod	2,032	10,000	100	2,225	10,000	100	1,379	10,000	100	0	-	-	0	-	-
Bishkek-Chelyabinsk	0	-	-	2,995	10,000	100	2,646	10,000	100	0	-	-	0	-	-
Bishkek-Ekaterinburg	58,933	4,117	100	53,728	3,690	100	47,356	5,867	100	49,922	7,178	100	47,706	8,362	100
Bishkek-Grozny	9,128	10,000	100	7,914	10,000	100	10,600	10,000	100	11,257	10,000	100	9,777	10,000	100
Bishkek-Irkutsk	3,048	10,000	100	0	10,000	100	11,588	10,000	100	13,398	10,000	100	12,130	10,000	100
Bishkek-Kazan	10,088	10,000	100	8,740	10,000	100	11,355	10,000	100	9,087	10,000	100	8,011	10,000	100
Bishkek-Krasnodar	7,969	9,418	100	11,052	5,002	100	15,954	7,312	100	13,657	10,000	100	19,335	10,000	100
Bishkek-Krasnoyarsk	24,586	5,648	100	17,864	6,250	100	16,794	6,922	100	16,451	10,000	100	15,450	10,000	100
Bishkek-Min-Vody	0	-	-	0	-	-	0	-	-	0	-	-	109	10,000	100
Bishkek-Moscow	456,515	2,468	89	478,620	2,856	99	573,356	2,682	100	516,393	2,914	100	577,705	3,020	100
Bishkek-Novosibirsk	112,846	4,842	100	107,702	5,806	100	107,295	6,058	100	94,631	5,968	100	119,928	7,048	100
Bishkek-Saint Petersburg	23,457	10,000	100	37,018	5,050	100	33,234	7,592	100	32,221	10,000	100	24,622	10,000	100
Bishkek-Samara	3,439	10,000	100	0	-	-	0	-	-	178	10,000	100	0	-	-
Bishkek-Surgut	25,233	5,242	100	17,539	7,312	100	16,444	6,922	100	12,602	10,000	100	12,152	10,000	100
Bishkek-Voronezh	0	-	-	0	-	-	5,076	10,000	100	6,624	10,000	100	7,315	10,000	100
Osh-Abakan	0	-	-	443	10,000	100	0	-	-	0	-	-	0	-	-
Osh-Anapa	0	-	-	0	-	-	0	-	-	339	10,000	100	0	-	-
Osh-Chelyabinsk	9,879	10,000	100	282	10,000	100	0	-	-	0	-	-	0	-	-
Osh-Ekaterinburg	61,611	5,942	100	55,702	6,250	100	62,499	6,250	100	69,017	7,048	100	79,031	7,178	100
Osh-Irkutsk	26,496	5,098	100	15,407	9,608	100	14,553	10,000	100	15,094	10,000	100	17,168	10,000	100
Osh-Kazan	662	10,000	100	0	-	-	0	-	-	1,766	10,000	100	2,576	10,000	100
Osh-Krasnoyarsk	34,472	4,326	100	23,376	5,450	100	19,598	6,352	100	19,724	10,000	100	2,690	10,000	100
Osh-Moscow	406,389	2,061	83	413,050	2686	99	464,924	2974	99	520,511	3,218	100	570,960	2,780	100
Osh- Nizhnevartovsk	0	-	-	0	-	-	0	-	-	1,767	10,000	100	11,383	10,000	100
Osh-Novosibirsk	95,603	5,638	100	100,945	6,250	100	95,058	5,578	100	111,497	5,578	100	126,727	6,458	100
Osh-Samara	12,212	10,000	100	10,100	10,000	100	1,343	10,000	100	4,964	10,000	100	5,637	10,000	100
Osh-Saint Petersburg	25,138	10,000	100	50,785	5,882	100	62,621	5,128	100	53,294	5,032	100	56,482	5,648	100
Osh-Sochi	0	-	-	0	-	-	0	-	-	467	10,000	100	0	-	-
Osh-Surgut	22,754	5,162	100	22,633	5,338	100	20,090	6,352	100	14,322	10,000	100	13,782	10,000	100
Osh-Tomsk	132	10,000	100	0	-	-	0	-	-	0	-	-	0	-	-
Osh-Tumen	82	10,000	100	0	-	-	0	-	-	0	-	-	0	-	-
Osh-Voronezh	0	-	-	0	-	-	0	-	-	0	-	-	1,641	10,000	100
Bishkek-Dushanbe	23,288	3,030	100	21,570	4,066	100	18,604	5392	100	16,651	5968	100	9,607	10,000	100
Bishkek-Istanbul	267,019	4,178	100	279,928	3,933	100	311,418	3,814	100	321,245	3,593	100	343,594	4,217	100
Bishkek-Antalya	0	-	-	0	-	-	12,563	10,000	100	5,685	10,000	100	22,340	6,682	100
Osh-Istanbul	33,975	10,000	100	29,129	10,000	100	0	-	-	0	-	-	0	-	-
Bishkek-Dubai	41,033	9,892	100	47,948	10,000	100	70,768	10,000	100	95,700	10,000	100	105,094	10,000	100
Bishkek-Sharjah	0	-	-	0	-	-	0	-	-	0	-	-	13,746	10,000	100
Bishkek-Tashkent	30,816	5,722	100	26,343	7,048	100	23,999	9,608	100	44,919	5,512	100	48,885	10,000	100
TOTAL:	*2,014,168*	*7692***	*99***	*2,043,356*	*7660***	*99***	*2,241,878*	*7745***	*99***	*2,277,089*	*8572***	*98***	*2,469,966*	*8905***	*99***

Note: * PAX – air passengers carried; ** average for HHI and CR4 for Kyrgyzstan's total air market.
[Source: Beishenaliev's calculation, based on the air traffic data for 2015-2019 from the Civil Aviation Agency of the Kyrgyz Republic and formula (1) for the HHI and formula (2) for the CR4.]

Appendix 2.
Data on Airlines' Share of International Air Passenger Traffic to and from Kyrgyzstan in 2015-2019

Table A2-1. Airlines' Share of International Air Passenger Traffic to and from Kyrgyzstan in 2015-2019

Airline (country of registration)	2015, in %	2016, in %	2017, in %	2018, in %	2019, in %
Ural Airline (RUS)	13.47	16.02	16.29	19.53	23.93
Avia Traffic Company (KGZ)	17.99	19.57	26.19	27.76	21.9
S7 (RUS)	13.17	15.04	12.17	12.14	13.39
Aeroflot (RUS)	8.85	9.76	9.2	9.74	13.29
Turkish Airlines (TUR)	9.05	7.88	6.3	6.63	7.19
Pegasus (TUR)	4.66	5.79	5.95	5.05	6.11
Air Astana (KAZ)	2.93	3.39	4.18	4.4	4.33
Flydubai (UAE)	2.04	2.35	3.24	4.19	4.33
China Southern Airlines (CHN)	3.06	2.76	2.08	2.39	2.35
Uzbekistan Airways (UZB)	1.06	1.06	1.06	1.3	2.01
Air Arabia (UAE)	0	0	0	0	0.57
Azimuth Airline (RUS)	0	0	0	0.1	0.36
Jazeera Air (KWT)	0	0	0	0	0.15
Qazaq Air (KAZ)	0	0	0	0	0.07
Air Manas (KGZ)	6.56	7.76	10.37	6.57	0.02
Air Bishkek (KGZ)	6.77	0.34	0	0	0
Vim Avia (RUS)	4.18	3.16	1.15	0	0
Air Kyrgyzstan (KGZ, Flag Carrier)	3.78	2.69	1.19	0	0
Atlas Jet (TUR)	1.68	1.7	0	0	0
Tajik Air (TJK)	0.43	0.52	0.3	0.2	0
Azerbaijan Airways (AZE)	0.18	0	0	0	0
Somon Air (TJK)	0.15	0.12	0	0	0
Yamal (RUS)	0.08	0.33	0	0	0

[Source: Beishenaliev, based on data on Kyrgyzstan's air passenger traffic for 2015-2019 from the Civil Aviation Agency of the Kyrgyz Republic.]

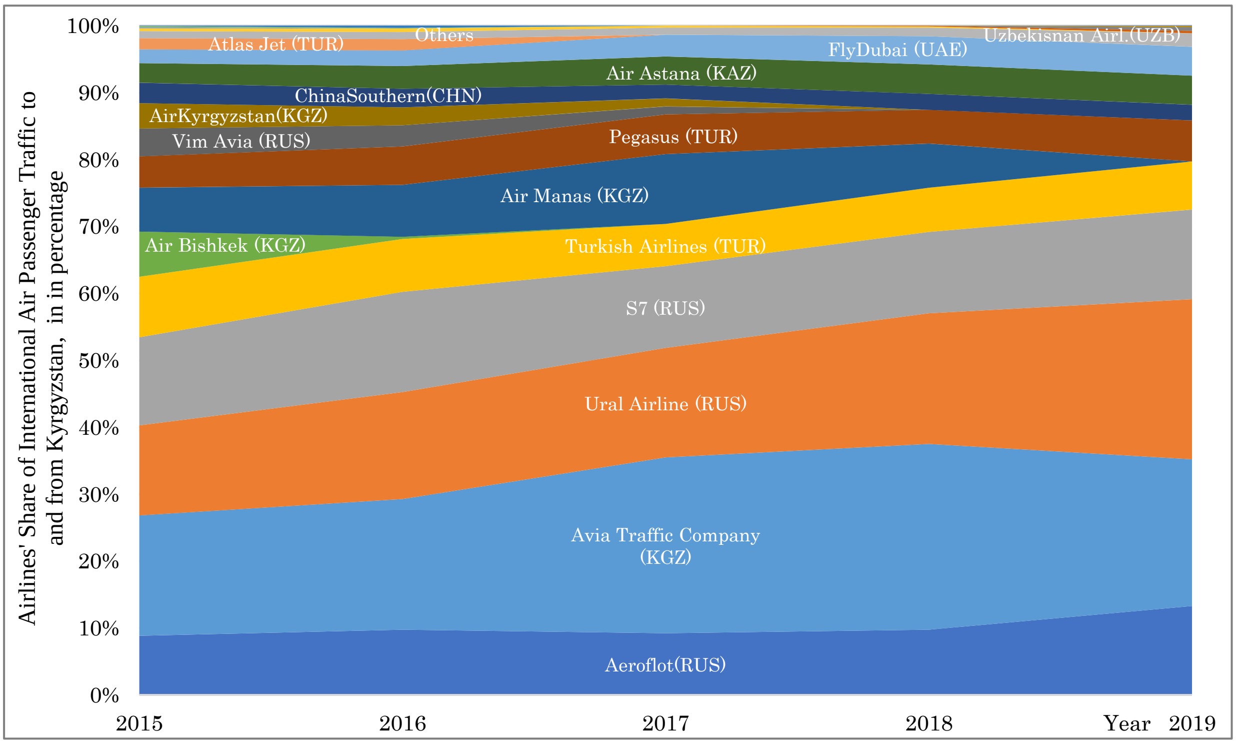

Figure A2-1. Illustration of airlines' share of international air passenger traffic in Kyrgyzstan for 2015-2019

[Source: Beishenaliev, based on data on Kyrgyzstan's air passenger traffic in Table A2-1.]

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