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RESILIENCE OF WHEAT CROP PRODUCTION IN SELECTED WAR ZONES IN AFGHANISTAN

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By

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November 2020

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Wheat is the staple food crop in Afghanistan, and maintaining its production plays an important role in ensuring food security and food self-sufficiency. However, being a country that has been facing war since 1978, it has been challenging for the wheat production industry to maintain its production to feed its people. In order to be resilient in their operations and grow in the face of war, players in this industry may have to withstand, survive and adapt to a different situation and phenomena within the conflict and war conditions as compared to the regular wheat production context in the peaceful countries. Hence, this study aimed to investigate the resilience, vulnerabilities, and capabilities of the wheat crop production players in a prolonged war zone.

This study is conducted through the case study approach. Required data was collected through interviews, observations and documents. Twenty-three informants, including individual farmers, cooperative members, and extension officers were selected and interviewed using the snowballing technique. Collected data was analyzed through thematic analysis.

In order to analyze collected data, this study employed Pettit et al., (2010) resilience framework. The study found that wheat crop farmers possess the status of balanced resilience in some points while the farmers have the status of unbalanced resilience in other parts.

Furthermore, this study found that farmers are vulnerable to lack of extension and credit services, inaccessibility to input/output markets, property destruction, lack of storage facilities, and lack of agriculture technologies/ machinery in the war zone.

In addition, wheat crop industry players in the war zone have to face psychological effects and financial corruption as well. Besides that, the study also revealed that farmers possess some specific capabilities that enable them to withstand, adapt and continue wheat crop production in war conditions. These specific capabilities include; ability in using traditional technologies, inputs exchange, community farmers' assistance, sourcing inputs from multiple sources, and multi-usage of inputs in a war zone.

Based on findings, this study recommends the provision of extension and credit services, inputs subsidies, agriculture machinery, and advanced agriculture technologies to farmers. The government have to create some channels through which farmers can access input/output markets. Building of underground storages is recommended because this will enable farmers to protect their produces from destruction in war conditions. The government must eradicate financial corruption that has adversely affected wheat crop production. Lastly, the government should support creation of farmers' cooperative through which farmers act independently and self-sufficiently.

This study has practical and theoretical contribution to the wheat crop industry as well as the current body of knowledge in the field of resilience. In the practical part, this study highlighted several unbalanced resilience areas that can be prioritized in the agriculture policy-making. In the theoretical part, this study revealed new information regarding the vulnerability and capability of wheat crop farmers in a war zone. The study found several new constructs to the resilience framework of Pettit et al. (2010) which can further explain the production of crops especially in a war/conflicts zone.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

DAYA TAHANAN PENGELUARAN GANDUM DI ZON PERANG DI AFGHANISTAN

Oleh

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Gandum merupakan tanaman makanan utama di Afghanistan dan mengekalkan pengeluaran tersebut memainkan peranan penting dalam memastikan keselamatan dan kemandirian makanan. Namun, memandangkan Afghanistan telah melalui peperang sejak 1978, ianya agak mencabar untuk pengeluar gandum di negara ini mempertahankan pengeluaran agar dapat terus menyediakan makanan kepada rakyat mereka. Untuk memastikan ketahanan dalam operasi mereka dan membangun dalam menghadapi konflik dan perang, pemain dalam industri ini harus bertahan, meneruskan dan menyesuaikan diri dengan situasi dan fenomena yang berbeza dalam konflik dan keadaan perang, berbanding dengan pengeluar gandum yang biasa di negara-negara yang aman. Oleh itu, tujuan kajian ini adalah untuk mengkaji daya tahan, kerentanan dan kemampuan pemain industri gandum dalam pengeluaran tanaman gandum di zon perang yang berpanjangan.

Kajian ini dilakukan melalui reka bentuk kajian kualitatif yang menggunakan pendekatan kajian kes. Data yang diperlukan dikumpulkan melalui temuramah, pemerhatian dan dokumentasi. Sebanyak dua puluh tiga informan termasuk petani, anggota koperasi, dan pegawai lanjutan telah dipilih dan ditemuramah menggunakan teknik pensampelan bola salji. Data yang dikumpulkan dianalisis melalui analisis tematik.

Kajian ini menggunakan kerangka daya tahan oleh Pettit et al. (2010) sebagai panduan menganalisa data yang dikumpul. Kajian ini mendapati bahawa petani tanaman gandum memiliki status daya tahan seimbang di beberapa bahagian sementara petani memiliki status daya tahan tidak seimbang di bahagian lain.

Selanjutnya, kajian ini mendapati bahawa petani secara khusus terdedah kepada kurangnya perkhidmatan lanjutan, bantuan kredit, halangan akses keluar/ masuk pasar, kemusnahan harta benda, kekurangan fasilitas penyimpanan, wujudnya korupsi kewangan, dan kekurangan teknologi/ mesin pertanian di zon perang. Selain kerentanan, kajian ini juga menunjukkan bahawa petani memiliki beberapa kemampuan khusus yang membolahkan mereka untuk bertahan, menyesuaikan diri dan meneruskan pengeluaran tanaman gandum dalam keadaan perang. Keupayaan khusus ini termasuk; kemampuan dalam menggunakan teknologi tradisional ketika kekurangan teknologi maju/ moden, pertukaran bahan semasa gangguan bekalan, mendapatkan bantuan dari komuniti petani ketika menghadapi kekurangan tenaga kerja, mendapatkan bantuan dari pelbagai sumber, dan bahan pelbagai guna ketika menghadapi kekurangan input dalam zon perang.

Berdasarkan kepada penemuan penyelidikan, kajian ini mengesyorkan penyediaan perkhidmatan lanjutan dan bantuan kredit, subsidi input, mesin pertanian, dan teknologi pertanian maju kepada petani di zon perang kerana dapatan kajian menunjukkan petani terdedah kepada unsur kerentanan tersebut. Kerajaan juga harus menyediakan beberapa saluran di mana petani dapat mengakses keluar/ masuk pasaran di zon perang kerana petani di dapati tidak mempunyai akses kepada pasaran tersebut. Pembangunan stor bawah tanah dianjurkan agar petani dapat menyimpan hasil tanaman mereka di luar musim kerana dapatan menunjukkan stor bawah tanah dapat melindungi stok gandum yang telah dituai dalam ketika perang berlaku. Selain itu, kerajaan juga harus membasmi korupsi kewangan, yang telah mempengaruhi proses pengeluaran tanaman gandum. Akhir sekali, kerajaan perlu mewujudkan koperasi petani kerana dapatan kajian ini menunjukkan petani dapat bekerja secara bebas dan berdikari sesama sendiri melalui kerjasama dalam komuniti mereka.

Kajian ini secara praktikal dan teori menyumbang kepada pengetahuan semasa dalam bidang ketahanan dan pengeluaran tanaman gandum. Secara praktikalnya kajian ini menyorot beberapa bidang ketahanan yang tidak seimbang dari para petani/ industri pengusaha tanaman gandum yang dapat dipertimbangkan dan diberi keutamaan dalam menggubal sebarang polisi sektor pertanian di zon perang. Dari segi teori, kajian ini mengungkap maklumat baru mengenai kerentanan atau masalah yang dihadapi oleh pemain industri tanaman gandum dan kemampuan mereka semasa beroperasi di zon perang. Di samping itu, kajian ini juga mendapati bahawa beberapa konstruk lain perlu ditambah dalam kerangka ketahanan Pettit et al. (2010) jika diaplikasikan di zon perang/ konflik.

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May Almighty Allah reward all of you the best.

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

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AFG	Afghani – current currency of Afghanistan
ASY	Afghanistan Statistical Yearbook
CSO	Central Statistic Organization of Afghanistan
FAO	Food and Agriculture Organization of the United Nations
Ha	Hectare
Kg	Kilogram
MAIL	Ministry of Agriculture, Irrigation and Livestock
MT	Metric Ton
NGO	Non-Governmental organization
PDPA	People's Democratic Party of Afghanistan
SU	Soviet Union
SUO	Soviet Union Occupation
USD	United State Dollar
USSR	Union of Soviet Socialist Republics

CHAPTER 1

INTRODUCTION

This chapter presents brief explanation of the study's background, Afghanistan's agriculture pre-war, during-war, post-war and current (during civil war and America invasion) condition, and agriculture share in GDP. In addition, problem statement, research questions, studies objectives, significance and organization of the study is discussed.

1.1 Background of the Study

Afghanistan is located in central Asia surrounded by land which constitute part of Central Asia, South Asia, and Middle East. In the south and east the country shares border with Pakistan, in west with Iran, in north with Tajikistan, Turkmenistan, and Uzbekistan, and in the far northeast with China (Figure 1.1 in the Appendix C) (Favre and Kamal, 2004). It has an area of 652,230 sq. km and an estimated population of 32.2 million (Central Statistics Organization of Afghanistan, 2019).

1.1.1 Afghanistan's Agriculture Sector

The agricultural sector's industrial growth in Afghanistan started in the early 1960s. Afghanistan had a diverse agro-industry before decades of ongoing conflict since 1979, including the production of textiles, sugar, fertilizer and wheat grains. However, the globally competitive agro-processing industry in the country has been demolished by decades of war (Soviet Union Invasion, Civil War and American Invasion), political instability, and neglect. Presently, the industry is facing problems and challenges such as limited technical capacity, electricity, and raw materials constraining the industry as a whole including processing inputs, agriculture production as well as the processing and distribution sectors (Jalal and Ward, 2011).

1.1.2 Afghanistan's Pre-War Agriculture

In the pre-occupation era of 20 years (1958-78), Afghanistan's gradual transition from relative isolation to a more open society was marked, and the economy stayed mainly agricultural. There has been some industrial growth, but this has mostly been related to agricultural product processing or farm input manufacturing. In 1978, an approximate 85% of the 15.2 million residents lived in villages and nearly all the other 15% were linked to rural businesses in some respects (Wesa, 2002).

Before 1978, the main industries in the nation were agriculture and pastoralism (farm animals). About 85% of the village population thrived essentially on farming and trading activities. As such, 90% of the agricultural land was used for food crops producing wheat on two-thirds of the sown region. Other agricultural products included cotton, dried and fresh fruits for national consumption and export (Khan, 2016).

The country was self-sufficient in grain by 1974, for the first time since the early extension of some improved seeds and technologies. The nation was able to export some agricultural products soon after 1974 and produced more than $200 million from it. It is worth noting that only 30% of the farmers who had just embraced enhanced techniques and contemporary machinery produced the $200 million export value. The other 70% of farmers still practicing traditional and subsisting agriculture at the moment. Because mechanization was not commonly embraced by farmers, and animals had been used on tiny and average size farms as a significant source of power. Tractors became increasingly important in bigger government-operated irrigation systems such as the Helmand Valley, but animal power remained widespread (Wesa, 2002).

Afghanistan had a well-organized agricultural growth strategy throughout that era. Agricultural and veterinary graduates, agricultural institutes, fourteen agricultural secondary schools and countless short- and long-term courses in agriculture expansion, crop protection, forestry and horticulture had been actively engaged in the development of the agricultural sector (Wesa, 2002).

Nearly all districts of the country had access to the agricultural extension program. An effective network for the distribution of improved seeds was in service, tested in the fields concerned, chemical fertilizers, insecticides, fungicides, and herbicides. Rural residents have been housed in different parts of the country with agricultural and veterinary training and study facilities. Due to the professional connection between the extension of agriculture and the associated department, soil samples from farmers from separate areas of the nation could be evaluated and farmers could be instructed about the quantity and type of fertilizer to use. On credit given by the country's only Agriculture Development Bank, tractors and other farm equipment could be acquired. Cotton ginning and sugar-beet factories paid a portion of the products they sold under contract to processing facilities in advance. Afghan Chemical Fertilizer Company (ACFC) in the north (Mazar-I-Sharif) was able to meet farmers ' needs by producing enough urea (Wesa, 2002).

Such measures steadily improved output and agriculture sector impressively developed. There were 19 agricultural research stations in Afghanistan before the occupation and an effective study program to develop high yield plants (Levin, 2009). In Kabul city, there were over 200 private poultry farms. In most areas of the nation, orchards and vineyards were formed, irrigation dams were constructed and profound wells were dug for irrigation reasons. Irrigated canals and Karezes (a local irrigation system) were cleaned annually and vast barren land was cultivated

and traditional farming shifted from a static stage to a more sustainable phase (Wesa, 2002).

1.1.3 Afghanistan's Agriculture during War

In 1979, the Soviet Union invaded Afghanistan to destroy the anti-communist movement and save the life of the established Afghan soviet government. Agricultural organizations, farms, and peasants were the victims of the Soviet occupation (1979 until 1989) during the invasion of Afghanistan (Wesa, 2002). Most agricultural services and organizations failed as a consequence of the war. War disrupted communication between different and connected government bodies as well as the transport of agricultural products and inputs. There was no season-to-season storage of agricultural products due to the destruction of power and communication scheme (Wesa, 2002). Extension of agriculture and other agricultural services became unsuccessful owing to the absence of skilled staff and equipment (Nijssen, 2010). Hunger, poverty, and starvation in villages were the result of destroyed harvest, scorched grain and other food. Farmers began to grow Opium during the war; although illegal; to replace periodic crops of agriculture as it offers quick money for their survival (Wesa, 2002).

There has been no significant development during the government of the People's Democratic Party of Afghanistan (PDPA) (Wesa, 2002). Afghans depended heavily on the Soviets for fuel, consumer products and a substantial portion of their food imported on credit from the USSR (Union of Soviet Socialist Republics) (Nijssen, 2010).

1.1.4 Afghanistan's Post – Soviet Union Occupation Agriculture

Following the withdrawal of the armed forces of the Soviet Union in 1989, many variations have happened in the agricultural sector, especially wheat as the primary crop. The area cultivated in 1978 to wheat was 8.28 ha per farmer. Same area was decreased in 1982 to 3 ha or 37% of which was cultivated in 1978 (Table 1.1 in Appendix B). Between 55% and 77% of the agricultural production ability of the country before the war was destroyed. Sampled farms had decreased their wheat acreage by 63% during 1978 and 1982. Simultaneously, the average yield per hectare fell by 46% for wheat (Wesa, 2002).

Although some regions experienced a greater decrease than others, all provinces were down. Large-scale farming provinces like Farah, Kandahar and Nimroz showed a greater provincial decline in wheat acreage (Wesa, 2002). The irrigated land area fell from 2,5 million hectares before to 15 million hectares primarily owing to years of war devastation (Levin, 2009). The conflict also led to a large drop in domestic animals (Table 1.2 in Appendix B). Nearly 10 million (50%) of the total animals; horses, bulls, cows, donkeys, goats, and lambs were demolished (khan, 2016).

There was also a drop in fertilizer availability and enhanced seed (Levin, 2009). There were no fertilizers available in most provinces, particularly those far from the capital, Kabul and the Mazar-I-Sharif fertilizer plant (Wesa, 2002). This scenario led to a further reduction in the production of agriculture.

Although the Soviet Union withdrew in 1989, the agricultural sector was unable to recover and confronts the post-war issues on an ongoing basis. One of the main issues was dealing with the presence of millions of land mines planted around the agricultural land by the Soviet Union. Irrigation streams and networks have also been mined to avoid Mujahedeen[1] from using them (Wesa, 2002). Further, mines had contaminated some 700 square kilometers of soil, making farming an extremely dangerous occupation. As many as 500 people per month have been direct victims of these mines in the latest years (Khan, 2016). In addition to the infrastructure issues, the farmer's large cultivation of opium poppies at the time also increased dramatically primarily because the central government had been unable to limit the practice (Table 1.3 in Appendix B) (Wesa, 2002).

Although there have been countless reports of village massacres (Levin, 2009), it is not possible to correctly estimate the complete number of victims of the years of invasion. In addition to an approximately one million dead, 200,000 to 300,000 people were disabled (Table 1.4 in Appendix B) (Khan, 2016). These casualties and disabilities of people among the Afghan villagers (Khan, 2016) including a lot of wheat farmers led to abandonment of farms. Those left and continued farming activities also faced lack of labor forces due to the mass migration of Afghan's people to the neighboring country looking for safer place to live (Formoli, 1995). To have a look at demographic changes due to SUO, refer to Table 1.4 in the Appendix B.

The conflict has demolished the entire agricultural infrastructure. To ruin the support system of the Mujahedeen, the Soviet Air Force bombed orchards, irrigation systems, villages, fields and livestock. For security purposes, the ex-communist government and the Soviet troops were cutting down numerous vineyards, orchards, and ornamental trees and shrubs. Vegetation cutting along the streets and roads in the province of Kabul and neighboring province of Parwan is an ideal illustration of intentional destruction of agriculture. During the war, the former Soviets intentionally demolished Afghanistan's ancient irrigation systems to deactivate the local economy. This war demolished around 43,000 hectares of fruit orchards, three million units of farm equipment and 3,000 irrigation systems (Formoli, 1995).

[1]Mujahedeen: Afghan resistance fighter who fought in the Soviet-Afghan War (1980-1989) against Soviet-backed regime and Soviet forces. These fighters were collectively known as the mujahedeen (for "struggles" or "people performing jihad") (Leitich, 2013).

Afghanistan had 19 agricultural research stations, as stated in the previous section, and an effective study program to develop high yield plants. These were also demolished during the Soviet Union occupation after the late 1970s. As a consequence of this war, research institutes were destroyed, equipment were stolen and employees left. For example, 70% of employees of Kabul University's Faculty of Agriculture left their jobs (Levin, 2009).

1.1.5 Afghanistan's Agriculture during Civil Wars and American Invasion

The conflict achieved a climax in 1992 when Mujahedeen took power, leaving almost one-third of the population (about six million) either internally displaced or outside the nation in refugee camps (refer to Table 1.4 in Appendix B). This war resulted in important cuts in agricultural manufacturing, leaving the nation in severe need of food and other aids. The farming system has been devastated; infrastructure has worsened and public extension services have been drastically decreased (Wesa, 2002). At the time, most of the assistance and rebuilding projects in Afghanistan were sponsored by the United Nations (UN) and Non-governmental Organizations (NGOs). The Mujahedeen or later Taliban government spent most of its funds on an ongoing military fight for which Pakistan supplied $10 million from its budget annually (Goodson, 2001).

During this era, the same sordid story of decreasing trend as stated above is reported (see Table 1.1 in Appendix B). The Taliban reestablished true law and order after a steady disruption spell. People came back home to re-take farming as a livelihood source. But quickly, the struggle between Taliban and anti-Taliban organizations (Mujahedeen) brought the nation back into the previous situation. In 1996, when the Taliban took Kabul, they implemented rigid legislation that restrained industrial sector and other industries. Several government agencies, central bank, treasury, tax and customs departments, police, and judiciary became weak and stagnant. Capital and credit were frequently used to meet fundamental requirements instead of investments. More than two-thirds of the individual loans were made available for food, clothing, medicine, weddings, etc., while only one-third was used for investment reasons (United Nation Office on Drug and Crime, 2003).

In reality, the infrastructure of Afghanistan was destroyed in the aftermath of conflicts and wars (SUO, Civil war). There were no fundamental social facilities: electricity, telephones, motorway, regular energy supplies, employment, food, and housing. Consequently, a big proportion of the population relied on UN and other aid agencies for survival as a consequence of crushing poverty and unemployment. By 1998, Western humanitarian organizations had supplied 50% of the residents of Kabul with food assistance (Khan, 2016).

The Taliban[2] were not the only contributors to the socio-economic devastation, they acquired from the Soviets the given legacy and that followed after 1992 between many groups. The extent of common suffering was sequentially horrible as the financial disaster in the country grew larger and larger (Khan, 2016). The Afghanistan economy has produced some strides in the agricultural sector with a GDP growth rate of about $2.1 billion since 2002 (Khan, 2016). The agricultural economy, however, still stayed stagnant due to structural defects, lack of human capital and periodic financing institutions, and failure of state schemes due to ongoing disputes and wars (Courtney et al., 2005).

Opium still monetizes the Afghan economy as income from drug cultivation, processing, and smuggling inject money into the agricultural, consumer, labor, and building markets of Afghanistan. In addition, provincial and district authorities are still colluding with criminal organizations and central government authorities are providing security for drug and opium peddlers. That may be why Afghanistan has produced much of the world's supply of opium over the past three decades (Courtney et al., 2005). Thus, while traditional crop production plunged drastically, poppy production enhanced many times (Khan, 2016).

1.1.6 Afghanistan's Agriculture Share in GDP

Afghanistan agricultural sector accounts for around 23% of the domestic GDP in 2017 and is the second biggest sector after the service sector (Central Statistics Organization of Afghanistan, 2019). The proportion of share of agriculture in national GDP mentioned above demonstrates the significance of this industry in the economy of Afghanistan. As the condition in the country improves and other industries such as manufacturing and services grow, agriculture's share of national GDP falls (Figure 1.2 in Appendix C) (Hassanzoy, 2013). However, agriculture still plays a significant part in people's livelihoods and more than 80% of the population is engaged directly or indirectly in the industry (World Bank, 2014). About half of all families earn at least portion of their revenue from agriculture and employ about 40% of the workforce in the country (World Bank, 2014). Therefore, this industry offers significant employment opportunities. It benefits women and other disadvantaged groups (poor, landless and nomads) and offers workforce opportunities to improve their productivity and decrease poverty and food insecurity in villages (World Bank, 2014).

[2]Taliban: Literally "those who seek [knowledge]," generally referring to madrasas' students. This also refers to a political group, the Taliban, that governed Afghanistan from 1996 to 2001 and now fights against US backed Afghan government (Stenersen, 2010).

Cereal and other annual field crop production are the main agricultural activities in Afghanistan, which accounted for approximately 37% of overall agricultural GDP in 2017 (Figure 1.3 in Appendix C). Wheat production is the biggest share of this aspect (i.e. one-quarter of GDP in agriculture) as shown in Figure 1.4 in Appendix C. This is followed by animal production of 13%, fruit and nut production of 14%. The other agricultural activities, such as vegetables, industrial plants and agro-processing, contribute approximately 36% to Afghanistan's agricultural GDP (Central Statistic Organization of Afghanistan, 2019).

Wheat is Afghanistan's staple food crop and retaining its production plays an important role in maintaining food security and food self-sufficiency. Owing to mountainous terrain in most of the country and arid to semi-arid climatic conditions, crops are grown on just around 14% of the total area (Table 1.5 in Appendix B). Approximately 70% of the overall planted area is cultivated with wheat crops. Wheat and its products are accounted for almost 60% and for the poorest even 75% of calories intake (Chabot and Dorosh, 2007).

1.1.7 Land Use Pattern in Afghanistan

Despite elevated farm jobs (relative to other industries), a surprisingly tiny percentage of Afghanistan soil is arable, only half of which is grown annually (Jalal and Ward, 2011).

Table 1.5 in Appendix B shows land use pattern in Afghanistan during 2009-2010. As may be seen, almost half (46%) of the total land is under permanent pastures, 39.27% is covered by mountains including waste lands, 14.73% is agricultural land of which 2.61% is under forests and woodland, 6.63% is fallow land, 2.81% is irrigated land and 2.68% is rain-fed land. Cultivable land accounts about 12% of total area of the country (almost 82% of total agricultural land). Only 5.5% of total area of the country (around 45% of cultivable land) is currently sown which is less than 50% of the cultivable land of the country. This implies that Afghanistan has the potential for expanding its net sown area by more 55%. Further, it is evidenced that irrigated land was only 2.8% of total area of the country (almost 23% of cultivable land) which makes agriculture purely dependent on nature (Afghanistan Statistical Yearbook, 2016-17). This information (Table 1.5 in Appendix B) implies that if more investments are done in agriculture sector to bring fallow land which makes almost 55% of total cultivable land under crop cultivation, it will increase agriculture production.

1.1.8 Wheat Crop Production, Consumption and Imports

While Afghanistan was self-sufficient in pre-war wheat production in 1974 (Wesa, 2002), production worsened during years of conflict owing to the combined impacts of extended droughts and the devastation of irrigation channels and infrastructure. First, the devastation caused by the conflict between the Afghans

and the Soviet forces, then the civil war following the Soviet withdrawal in 1989 (Chabot and Dorosh, 2007; Persuad, 2012).

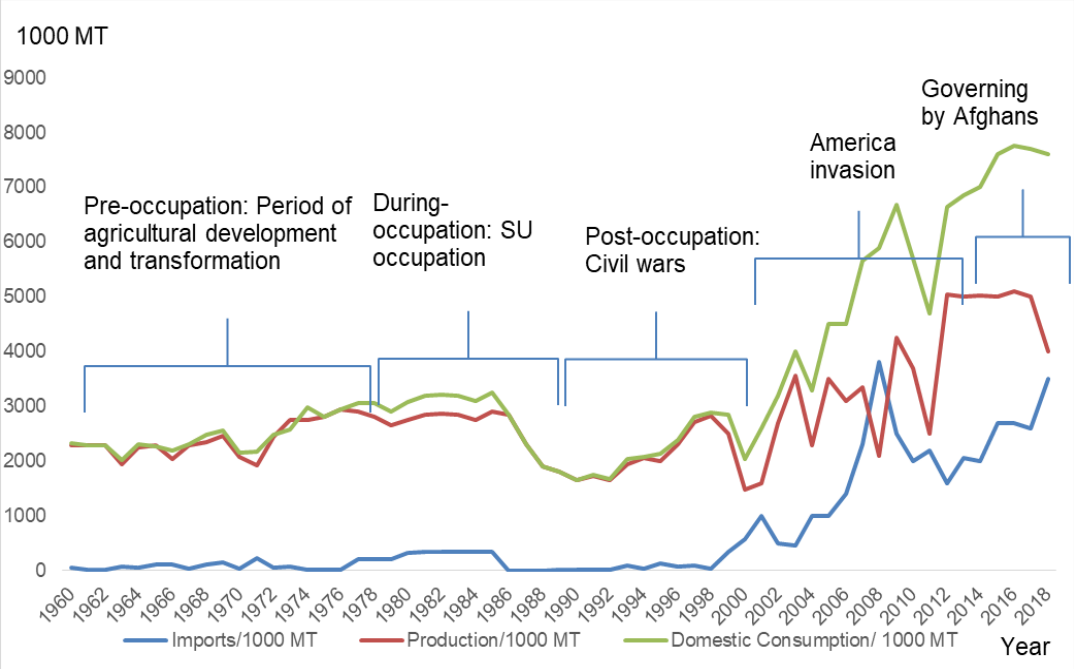

Figure 1.1 : Wheat Crop Production and Consumption in Afghanistan from 1960 to 2017 [Source: Index Mundi (2018)]

Pre SUO, Afghanistan was self-sufficient in cereals (mainly wheat) and even exported the cereals including wheat production surplus to other countries. Today, however, the country imports an average of 1.2 million mt/year due to the decline in wheat production caused by war (World Bank, 2014).

Figure 1.5 shows ups and downs of wheat crop production, consumption and imports from 1960 to 2018. Before the SUO in 1979, Afghanistan was self-sufficient in wheat crop production. Thus, the country was able to meet domestic demand for wheat and even was exporting wheat surpluses to other countries as described in "agriculture before war" section above. Therefore, graph lines of production and consumption was always close to each other and were intercepting most of the time. During that time afghan government were investing in agriculture and had plan for agriculture development. Farmers were able to access extension services across the country, so they were harvesting good yields from their land. Once the country was invaded by SU in 1979 as shown in the Figure 1.5 above, production trend began to go down while domestic consumption trend was still high. Production declined due to the failure of agriculture organizations, and agriculture extension services as a consequence of war. The diminishing trend of wheat crop production continues down during the whole era of SUO (1979-1989), and then overlapped to civil war (1989-2001) era. During the civil war most of the time production line was touching the line of wheat consumption in the graph.

Because during the SUO, one third of the country population left the country in order to take shelter outside the country. Thus, demand for wheat crop production was equal to the production of wheat crop in the country. The deficit between wheat crop production and wheat crop consumption arisen once America invaded the country in 2001. With the return of millions of refugees from other countries, demand for wheat crop also increased inside the country. However, due to the ongoing conflict and destruction of agriculture infrastructure happened during SUO and civil war, country is not able to meet domestic demand for wheat crop. This scenario caused wheat crop imports to be increased in order to meet domestic demand for wheat crop during American invasion of the country. This four decades of continuous war and social unrests left people in dire situation and made them more reliant on food aids and imports from outside (USAID, 2020).

1.1.9 Food Aid to Afghanistan

Four decades of conflict, continuous movements of returnees, civil strife, insurgent activity, and frequent natural disasters have led Afghanistan's to chronic humanitarian need. The primary drivers of chronic food insecurity in Afghanistan are widespread war, bad rain-fed staple production and restricted employment opportunities (USAID, 2020). Imports of wheat (both commercial and food aid) are significant contributors of wheat supply and complete food availability in Afghanistan, averaging 1.04 million tons per year from 2002/03 to 2004/05 (25% of total wheat supply over the period) (Chabot and Dorosh, 2007). According to Figure 1.6 in Appendix C, Afghanistan receives food aids in the form of cereals (mainly wheat) every year from international organizations. Afghanistan received large amount of these food aids in 2001 (349,727 MT) following by 2002 (343,149) as emergency aids from international organization as a result of severe drought in the country. However, these aids were decreased in the following years but increased back in the 2008 to (295,053 mt) due to food urgency in the country. This food emergency was caused by spike of food prices globally and food import ban by neighboring countries particularly Pakistan. Furthermore, the Figure shows a significant decline in the availability of food aid into the country from 2009 onwards. While in 2014 the country's administration was officially submitted to Afghan side, the country received the lowest (15,989 mt) amount of food aids from international organizations. The decreasing trend in food aid supplies to Afghanistan is expected to continue as the country now is considered taken over by their own people. The reduction of food aids over the last few years as evidenced in Figure 1.6 in the Appendix C, implies that the government is going to face a great challenge in ensuring self-sufficient in the production of wheat.

1.2 Problem Statement

Afghanistan's agricultural sector accounted for around 23% of the domestic GDP in 2017 and is the second biggest after service sector (Central Statistics Organization of Afghanistan, 2019). Agriculture sector plays a significant part in people's livelihoods and more than 80% of the Afghanistan's population is directly

or indirectly engaged in the industry (World Bank, 2014). About half of all Afghan families earn at least portion of their revenue from agriculture. The sector employs about 40% of the workforce in the country (World Bank, 2014). It benefits Afghan women, disadvantaged groups (poor, landless and nomads) and offers workforce opportunities to improve their productivity and decrease poverty and food insecurity in villages (World Bank, 2014).

Cereal and other annual field crop production are the main agricultural activities in Afghanistan. It accounted for approximately 37% of overall agricultural GDP in 2017. Wheat production is the biggest share of this aspect (i.e., one-quarter of GDP in agriculture) (Central Statistic Organization, 2019). Wheat is the staple food crop in Afghanistan and maintaining its production plays important role in ensuring food security and food self-sufficiency. Wheat and its products are accounted for almost 60% to 75% of calories intake in Afghanistan (World Bank, 2005). Due to mountainous land in most of the country and arid to semi-arid climate, crops are grown on only around 14 % of the overall land. Approximately 70 % of the overall crop cultivated land is grown with wheat crops (Chabot and Dorosh, 2007).

Pre – war (before Soviet Union occupation), Afghanistan was self-sufficient in wheat and even exported the wheat surplus to other countries. Today, however, the country imports an average of 1.2 million mt/year due to the decline in wheat production caused by war (World Bank, 2014). While Afghanistan was self-sufficient in pre-war wheat production in 1974 (Wesa, 2002), production worsened during years of conflict owing to the combined impacts of extended droughts and the devastation of irrigation channels and infrastructure. First, the devastation caused by conflict between the Afghans and the Soviet forces, then the civil war following the Soviet withdrawal in 1989 (Chabot and Dorosh, 2007; Persuad, 2013). The declining trend of wheat production continued further during civil war from 1989-2001. In 2001, after the invasion of Afghanistan by America, the deficit between wheat crop production and consumption increased. Meanwhile, imports of wheat from outside the country increased too. Four decades of continuous war, social unrest, continuous movements of returnees, civil strife, insurgent activity, and frequent natural disasters left people in dire situation and have led Afghanistan to chronic humanitarian need. The primary driver of chronic food insecurity in Afghanistan is the widespread war (USAID, 2020).

Despite the war and conflict that is happening in the country, some wheat crop farmers are still producing wheat for the market as shown in Figure 1.5. Although the production seems to be reducing over time, but those resilient in continuing wheat production is commendable and should be learned from. This study seeks to understand how these farmers are able to sustain wheat crop production in war conditions. Revealing this new information will help us to understand wheat crop farmers' vulnerabilities, capabilities and their resilience status in the war zone.

There is lack of studies focusing on the resilience of agriculture and farmers in war/conflict zone. Rather, researchers only looked into farmers vulnerabilities from

the perspective of food security (Awodola and Oboshi, 2015; Kah, 2017) and the effects of conflict on agriculture production (Jaafar et al., 2015; Adelaja and George, 2019) in conflict/war zone. While only limited agriculture production studies done from the perspective of resilience, those who take this perspective mainly focused on agriculture resilience towards climate change (Teklewold et al., 2017; Jasna et al., 2017). Thus, the gap regarding agriculture resilience, farmers' vulnerabilities/problems and their capabilities in withstanding the vulnerabilities in conflict/war zone could be best addressed by studying the context from the qualitative perspective such as in-depth case study because it can deeply explore the research problem. The present study attempts to do so by interviewing and observing farmers daily farming activities in the conflict/war zone.

1.3 Purpose of the Study

This study is designed to provide a better understanding of farmers resilience toward war, war related challenges that affect production of wheat crop in a war zone and the capabilities farmers show while practicing agriculture activities in the war zone. This study also aims to reveal new information regarding war effects on agriculture production.

1.4 Research Questions

The following research questions were used as a guide to the study:

1. What is the vulnerabilities status of farmers in being resilient in the production of wheat in the war zone?
2. What are the capability factors of wheat crop farmers in the war zone?
3. What is the resilience status of wheat crop farmers/industry players in the war zone?

These three-research research questions define the major areas which will be examined in this study that challenge wheat production in war zone. Addressing these research questions in this study provide an insight through further investigation into establishing strategies for maintaining wheat crop production in war zone. Uniquely, each question complements the other and provide a more detailed understanding of the challenges and resilience toward wheat crop production in a war zone.

1.5 Significance of the Study

This study is unique and significant in many counts because it will generate some important information regarding wheat crop production in a country suffered from an ongoing and long-lasting war (civil wars and external invasions) for four decades. The current research will investigate and reveal the adverse effects of

wars on wheat crop production, farmers' vulnerabilities, capabilities and resilience status. This study is also important for being conducted in a specific geographical area (Afghanistan) affected by long lasting war (civil wars and external invasions).

1.6 Organization of the Thesis

This thesis is organized into six chapters: introduction, review of literature, methodology, findings, discussion, and conclusion. Chapter 1 describes the importance of wheat crop in world stability, background of Afghanistan agriculture sector, Afghanistan agriculture before, during, after war and current condition, agriculture share in GDP, land use pattern in Afghanistan, wheat crop production, consumption and imports, food aid to Afghanistan, problem statement, research questions, objectives, significance of the study and lastly, organization of the study. Chapter 2 presents concept of food security, food security and conflict, resilience with relevant empirical studies, and lastly theoretical framework. Chapter 3 presents study design, case study as research strategy, case selection, description of the case, selection of the informants, description of the informants, accessibility into selected provinces, conceptual framework, data collection, analyzing and interpreting the case study evidence, and lastly enhancing the rigor and trustworthiness of the research. Chapter 4 presents and elaborates findings of the study under vulnerability and capability constructs. Further chapter 5 discussed the findings of the study in literature. Last but not least, Chapter 5 summarizes the key findings of the study and draws a conclusion with suitable recommendations as well as limitations, contributions, and suggestions for further studies.

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LIST OF PUBLICATIONS

Stanikzai, A.N., Ali,F., & Kamarulzaman, N.H. (2021). Vulnerabilities of wheat crop farmers in war zone. *Food Research, 5*(2), 427-439.

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2. 9th International Qualitiative Research Conference (QRAM 2019). (17-19 October 2019, Bangi Resort Hotel, Off, Persiaran Bandar, Bangi Golf Club, 43650 Bandar Baru Bangi, Selangor, Malaysia), Understanding the Resilience of Wheat Crop Production in the Selected War Zone, Afghanistan.