Implementing the 2030 Agenda for Sustainable Development in Palestine: An Innovation-Centric Economic Growth Perspective

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Abstract

The 2030 Agenda for Sustainable Development was adopted, collectively, in September 2015, by all the Member States of the United Nations including the State of Palestine. One of the main components of this Agenda is the Sustainable Development Goals (SDGs) detailed through targets which address the main pillars of sustainable development, namely social, economic, and environment. The State of Palestine was one of the pioneers in the Arab region to adapt and implement the 2030 Agenda and establish the governmental mechanisms needed to support its implementation. The Government of Palestine started aligning its national strategies with the SDGs and cross sectoral strategies in the National Policy Agenda of the period 2017-2022. Globally and in Palestine, achieving the SDGs is challenging. For Palestinians, this needs more effort due to the special situation of Palestine as a state under occupation. However, Palestinian leaders have invested in human capital and by acknowledging the impact of innovation on economy, they started supporting innovation through different specialized organizations. The later includes incubators, centres of excellence and accelerators. This paper aims at presenting different approaches to innovation adopted in Palestine which fosters the achievement of the SDGs and presenting an evidence-based discussion on the positive role of innovation in fostering economic growth. This also includes a list of challenges facing Innovation and implementation of SDGs in Palestine in addition to a list of recommendations to overcome these challenges.

Keywords: *2030 Agenda, Sustainable Development Goals, Innovation, Economic growth, State of Palestine.*

1 Introduction

The 2030 Agenda for Sustainable Development, or the 2030 Agenda, puts forward a broad agenda for global actions on sustainable development where the Sustainable Development Goals (SDGs) lie at the core of this new programme for development. The SDGs are a collection of 17 interrelated goals set by the United Nations (UN). Each goal has its own targets to be achieved with a total number of 169 targets. The SDGs consider a broad range of economic, social and environmental development issues, including, but not limited to, health, education, poverty, hunger, gender equality, climate change, energy, water, sanitation, environment, urbanization, and social justice (RIO+20, 2012).

Achieving the SDGs requires new innovation approaches that are socially inclusive and environmentally benign, meaning the need for innovation in development. The latter is achievable through bringing innovation into the foreground of development projects. Innovation, which is a constituent of Goal 9 (Industry, Innovation, and Infrastructure), is a key enabler of most, if not all, the Goals (UNCRAD, 2017). It is understood as new forms of organizational and social practices, as well as improved or new technological products and processes. Moreover, innovation along with the diffusion of technologies have an indispensable role in the economic growth of countries by increasing productivity and creating wealth and economic well-being; thereby enhancing the competitiveness of cities (UNCRAD, 2017).

The State of Palestine, like all Member States in the UN, adopted the 2030 Agenda for Sustainable Development and started aligning its priorities with the SDGs. Consequently, the Palestinian Council of Ministries established a National SDG Task Force team via a Presidential decree, headed by the Prime Ministers' Office to lead,

coordinate, monitor, and implement the SDGs. The team is currently working on developing an appropriate framework for the implementation of SDGs and is composed of the membership of all relevant partners. This includes partners from the private and public sectors, civil society organizations, universities, research centers, incubators, centers of excellence, development experts, NGOs (i.e. non-profit/non-governmental organization) among others. However, the possibility of advancing the SDGs in the context of occupation poses major challenges for the implementation of measures that support Palestinian development strategies (UNDP, 2018). Rightfully, the most visible challenge is related to the ongoing occupation. Despite this reality, Palestine is being considered near the top of the Arab world in terms of several and important social indicators, including maternal mortality, vaccination rates, and literacy. These top ranks resulted from the effort of Palestine's government, civil society, and families (Thomsen A., 2017). In Palestine, the government, private sectors, and civil society agree on the positive role that innovation can play in addressing the challenges facing the implementation of the SDGs as well as boosting the economic status of the country which leads to resilience. They started investing in innovation for the purpose of developing and improving the living conditions of local society and overcoming the challenges imposed by the occupation.

This research paper aims at presenting different innovation approaches being adopted in Palestine and leading to the achievement of the SDGs and how they affect the local economic growth. The alignment of Palestine national strategies with the SDGs will be highlighted along with a selected list of challenges facing the implementation of the SDGs in addition to a list of barriers to innovation. This research paper will also provide recommendations to be considered in the coming years to maximize the positive impact of innovation on boosting national economic growth and achieving the SDGs in Palestine. The methodology followed by this research is the literature-based research. Different governmental reports, studies, action plans along with a list of international studies and reports about Palestine on innovation and implementation of SDGs and their related challenges are surveyed and analysed.

In this paper, section 2 summarizes the components of the 2030 Agenda with a focus on its SDGs. Section 3 highlights the impact of innovation on economic growth. The challenges facing Innovation and the Implementation of SDGs in Palestine are provided in Section 4. Section 5 sheds the light on the efforts to realize SDGs and Innovation in Palestine. A list of recommendations to foster innovation along with related discussion are highlighted in Section 6. The paper concludes by exploring the research's way forward.

2 The 2030 Agenda and Sustainable Development Goals

The roots of the 2030 Agenda for Sustainable Development return back to the "Rio+20" Conference on Sustainable Development, 2012, where different Governments agreed on the need for developing global Sustainable Development Goals (SDGs) based on the Millennium Development Goals (MDSs). This includes taking into consideration new issues related to the natural resources' management, effective institutions, sustainable consumption and production, good governance, peaceful societies, and the rule of law (EC, 2017). In the run-up to the adoption of the 2030 Agenda, which took place in September 2015 by all the Member States of the United Nations including the State of Palestine, different Member States worked together to ensure an ambitious global outcome to be achieved through the Agenda.

The 2030 Agenda is "a *plan of action for people, planet and prosperity which seeks to strengthen universal peace in larger freedom*". Its goals and targets are intended to "*stimulate action over the next years in areas of critical importance for humanity and the planet*" and "*to establish sites of partnership for collaborative engagement and action*" (UN, 2015). At the heart of the Agenda there are five critical dimensions that are (1) the people, (2) prosperity, (3) planet, (4) partnership, and (5) peace, which are also known as the 5Ps (UNSSC, 2017). The sustainability sits at the core of these five dimensions with a focus on the Sustainable Development three main pillars; the economic, social, and environmental ones as illustrated in Figure 1.

Figure 1: The 2030 Agenda and the 5P's Model for Sustainable Development (UN, 2018)

The economic, social, and environmental pillars of the Sustainable Development are related to the Prosperity, People, and Planet dimensions of the 2030 Agenda respectively. The Peace dimension is the ethical dimension of the Agenda, which concerns ideal and values such as freedom, justice, equality, and human rights. The fifth dimension, the Partnership, focuses on the approaches needed to implement the goals of the Agenda as well as to achieve the universal engagement that is essential for the success of the Agenda's ultimate aim, that is; "*to transform the world into a better place to live in*".

The 2030 Agenda consists of four main sections, namely: the (i) Declaration, (ii) Sustainable Development Goals and targets, (ii) means of implementation and global partnership, and (iv) follow-up and review (UN, 2015). The Sustainable Development Goals, the SDGs, in turn and contrary to what many believe, do not represent the Agenda in its entirety. Meaning that they are not a summary of the Agenda, but rather focus areas that are necessary to achieve the Sustainable Development. The 2030 Agenda includes 17 SDGs with 169 associated targets, all aimed at a universal, integrated, and transformative vision for a better world. The 17 SDGs are illustrated in Figure 2 while a brief description about each goal along with the number of its associated targets are provided in Table 1.

Figure 2: The 17 Sustainable Development Goals (UN, 2018)

Table 1: The SDGs and associated targets (UN, 2015)

Goal	Name of Goal	Description	Targets
1	No Poverty	End poverty in all its forms	7
2	No Hunger	End hunger, achieve food security and improve nutrition and promote sustainable agriculture	8
3	Good Health	Ensure healthy lives and promote well-being for all at all ages	13
4	Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	10
5	Gender equality	Achieve gender equality and empower all women and girls	9
6	Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all	8
7	Clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all	5
8	Good jobs and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	12
9	Innovation and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation	8
10	Reduced inequalities	Reduce inequality within and among countries	10
11	Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable	10
12	Responsible consumption	Ensure sustainable consumption and production patterns	11
13	Climate action	Take urgent action to combat climate change and its impacts	5
14	Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	10
15	Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	12
16	Peace and justice	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	12
17	Partnerships for the goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development	19
		Total	**169**

It is worth noting that the implementation of the SDGs take place with a full collaboration with different types of institutions including governments of countries, ministries, other government organizations, universities, research institutions, citizens, civil society organizations, international organizations, business organizations and others such as professional associations (UN, 2018).

The 8th and 9th goals of the SDGs are focusing on economic growth and innovation respectively. Different internationals studies shed lights on the importance of innovation as a crucial driver of economic growth and development. They highlight the essential role of innovation in the economic progress that benefits businesses, consumers, and the economy of the country as a whole. With over half of the world's population living in cities, the growth of new industries and ICTs are becoming ever more important. The latter needs a huge investment in innovation and people that are able to convert their new and valuable ideas into reality. The necessity of innovation to economic growth is explained in the next section.

3 Innovation and Economic Growth

The importance of innovation as a critical dimension for economic change was introduced by Joseph Schumpeter in his book titled "*The Theory of Economic Development*" (Schumpeter, 1934). In this book, Schumpeter explored the cyclical evolution of the economic world focusing the analysis on the important role assumed by innovation in starting a new phase of economic development. He placed innovation in the evolution of industries and within the process of economic transformation. For him, innovation is very closely linked to the emergence, growth, and decline of industries, which historically mark the development of economy worldwide (Malerba, 2005).

Innovation, as defined by Pierre Lionet, is "*a process by which a novel idea is brought to the stage where it eventually produced money … It is a dynamic technical, economic and social process involving the interaction of people coming from different horizons, with different perspectives and different motivations*" (Gerguri & Ramadani, 2010). The Organization for Economic Cooperation and Development - OECD (2005), in turn, defines innovation in Oslo Manual as "*the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or organizational method in business practices, workplace organization or external relations*". With these broad definitions, innovation could have different meanings depending on the lens from which it is being seen. For customers, it means products with better quality and better services, which leads to better way of life. For businesses, innovation represents sustainable growth and development as well as realization of great profit. For employees, it means new and more interesting jobs that require more mental faculty, which results in higher salaries. For the whole economy, innovation means a bigger prosperity and productivity for all (Gerguri & Ramadani, 2010).

Innovation is categorized as the implementation of one or more types of innovations, for example technological or non-technological innovations. It is also divided into four main types, that are (OECD, 2005, Talegeta, 2014):

1. *Product innovation*: refers to the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses.
2. *Process innovation*: focuses on the implementation of a new or significantly improved production and/or delivery method for the creation and provision of services, including significant changes in equipment, techniques and/or software.
3. *Marketing innovation*: refers to the implementation of a new marketing method involving significant changes in product placement, product design or packaging, product promotion and pricing (i.e. the use of new pricing strategies to market products), and
4. *Organizational innovation*: focuses on the implementation of a new organizational method in the firm's business practices, workplace organization or external relations (OECD, 2005).

Innovation is being considered globally as a main driving force of economic growth of any country. The OECD emphasizes that the long run productivity and economic growth is highly dependent on the creation and fostering of an environment that encourage innovation and application of new technologies. In this matter, the innovation and its related activities are considered as a wheel for underpinning the economic productivity and growth. Countries that boost the generation of innovation, creation of new technologies, and encouraging adoption of these new technologies grow faster than those that do not (Rosenberg, 2004).

Developing countries, including the State of Palestine (ISI, 2018), want a stake in the global community of science, knowledge, and creation. This requires these countries to establish innovation- and technology-driven economies. Meaning that they need to build their capacities to participate in and benefit from the modern innovation- and technology-driven economy. Innovation along with the associated technologies are increasingly at the heart of economic growth around the world. They are being treated as crucial tools for addressing emerging issues such as global urbanization, climate change, and growing demand for energy, food, safety, water, and others. Innovation; therefore; helps developing countries to seize new opportunities in transforming global economy (Agénor et al., 2012). The World Bank (2016) estimates that up to two-thirds of all jobs in developing countries are apt to automation. Similarly, the World Economic Forum (WEF) estimates that nearly two-thirds of current primary school students will be employed in jobs and industries that do not currently exist (WEF, 2016) as a result of the Fourth Industrial Revolution and its unprecedented technologies. To face these pressures, developing countries are seeking to change their economic trajectory and industrial mix through innovation that is boosted by new technologies. Today nearly half of all developing countries have released their national Science, Technology, and Innovation (STI) strategies, and there is a growing global consensus that innovation plays an essential role in advancing economies. However; achieving this diffusion of capability require effective policy-making and good governance (CSIS, 2017).

4 SDGs' Implementation Challenges and Barriers to Innovation

4.1 SDGs' Implementation Challenges: in Developing Countries and in Palestine

Although the SDGs provides opportunities to all countries around the globe, their implementation is challenging, especially in developing countries, as the cost of its implementation is very high though it can bring long-term benefits for these countries. The key challenges of implementing the SDGs in developing countries are divided into five broad categories that are summarized below:

1. *Aligning the SDGs with the national planning process*: implementation of the SDGs is a context-based process. It varies from one country to another and there is no one single framework that is applicable to be used by all countries. Not all SDGs are of equal importance in all nations; therefore; each country should handle the SDGs in accordance with its domestic realities. Each national owner and development priorities should provide the appropriate foundation for achieving the SDGs and the domestic, national visions (LEAD, 2015). Countries; therefore; should have to find and explore ways of translating the global goals into their particular context; integrating the 2030 Agenda and its related SDGs into the national, sub-national, and local-level development plans.
2. *Coordination, management and leadership of the SDGs implementation process*: implementing the agenda and its related SDGs require a full coordination among governmental ministries and departments at the national level. The coordination should be equally important at all levels of the government. This requires identification of a leading agency with all authorities and capacities to orchestrate smooth, integrating actions between different governmental actors. The 17 SDGs are interlinked and cannot be implemented effectively in isolation; therefore; coordinated actions from different ministries, institutions, and stakeholders from all national, provincial, and district levels is needed (LEAD, 2015).
3. *Adequacy of financing and other means of implementation*: according to their crucial role in the implementation process, the means of implementation of 2030 Agenda are discussed as a separate section in the Agenda and added as a separate goal of the SDGs (i.e. goals 17). The means of implementation are divided into financial and non-financial instruments (UN, 2015). The financial means of implementation include public-private partnerships (PPPs), foreign direct investment (FDI), domestic revenue mobilization (DRM), and official development assistance (ODA). In turn, the non-financial means of implementation include global financial architecture and economic stability, systematic issues such as trade in goods and services, data collection and monitoring, transfer of technology and intellectual property rights, climate negotiation and outcomes, overseas remittances among others (Friedrich-Ebert-Stiftung, 2016). Financial issues are one of the most critical means of implementation for achieving the SDGs, as the annual investment required for the economic infrastructure in the power, transport, water and sanitation, agriculture, buildings, telecommunications, industrial and forestry sectors is huge. In this matter, developing countries should provide an annual investment between $3.3 trillion to $4.5 trillion per year to finance the proposed SDGs. However; the current investment is around $1.4 trillion, which leaves these countries with an annual financing gap of around $2.5 trillion (UNCTAD, 2014).
4. *Standardization, Data-related issues and capacity of National Statistical Agencies*: while adequate financing is essential for the successful implementation of the SDGs, data validity, availability, and accessibility are also critical for ensuring transparency and accountability for spending, as well as for tracking the progress of SDGs implementation. To main issues should be addressed to successfully standardized and verify data, including data quality, data availability, data gaps and difference in data between national and international sources. Each nation should have the capacities needed to collect and report national statistics that should be comply with international standards. This requires establishing of a common platform for data gathering, where data are shared through an open-source system using a user-friendly methods and techniques to ensure transparency in data reporting (Sarvajayakesavalu, 2015).
5. *Partnership and stakeholder participation in SDGs implementation*: the implementation of SDGs requires a strong and effect institutional mechanism involving all stakeholders from all national levels. This includes representatives from the government, public and private sectors, academia, international and national NGOs, International agencies such the UN, development partners such as the world bank and regional development banks, general public among others. Stakeholders from different national levels can contribute, and should contribute, in every step of the SDGs implementation, from agenda setting to ensuring accountability. Every

stakeholder should participate in the national monitoring and reviewing mechanisms as well to guarantee transparency and accountability. It is also the responsibility of national leaders and government representatives and specialists to monitor and ensure the efficient use and flow of resources specially those related to financial issues (Friedrich-Ebert-Stiftung, 2016).

In addition to the above-mentioned challenges, excluding "*Aligning the SDGs with national planning process*" as Palestine already considered this step, achieving SDGs in Palestine faces further challenges due to the special situation of Palestine as a state under occupation. The latter includes:

1. *Israeli occupation*: the imposed policy of isolation between different districts in West Bank affect achieving the SDGs such as ending poverty, education for all, employment, achieving health and well-being, clean energy, safe water, and others. Additionally, Area "C", which is an administrative division of the West Bank with a minimal control by the Palestinian authority in Ramallah, constitutes around 61% of the West Bank. Although Area "C" is rich with natural resources, enhancing its infrastructure and economic and urban expansion is prohibited by the Israeli occupation. Moreover, by the end of 2016, the statistical data showed that around 42% of Palestinian refugees live in Palestine in 19 camps in West Bank and 8 camps in Gaza. These camps rely on aids from the United Nations Relief and Works Agency (UNRWA) for the provision of basic rights such as health and education. The recent cutbacks of UNRWA financial services in health, education and provision of food impact negatives the rights of refugees (GUPW, 2018).
2. *Gaza Blockade*: the Israeli siege and blockade on Gaza Strip is a real barrier for implementing the SDGs in the Strip. This siege is responsible for many economic, social, and environmental repercussion, including, the high-level rate of unemployment and lack of opportunities especially for the youth, lack of urban development and maintenance due to restricting the entry of building materials, striking poverty that has led to the dependence on food aid due to restrictions on farming and trade, no access to clean drinking water due to the Israeli control on water resources, and electricity shortages due to the restrictions on energy impose (Palestine Cabinet, 2018).
3. *East Jerusalem*: the east part of Jerusalem city has been isolated from the rest of the occupied West Bank in an attempt to destroy its social fabric. This isolation prevents any implementation of SDGs in this part of the city, prohibiting the establish of any type of initiatives to improve and enhance the infrastructure of the city by the Palestinian people.
4. *Impact of Neoliberal Economic Policies*: the Palestinian economy tends to follow the neoliberal model, adopting policies to open doors to global market including the Israeli one. These policies encourage capital owners to invest in the services sector and neglect the productive one, resulting in weakening the Palestinian economy and limit the opportunities for local products to compete with other products and gain the trust of customers. Based on the Palestinian investment law number (1) of 1998, the economic development should be in the framework of disciplines and standards of investment in Palestine, making the current economic systems a free-market for all investors taking into consideration the safeguards of local capital and profits, as stated in Article (10) of the law (GUPW, 2018). However; the economic development in Palestine is being hampered by a series of restrictions imposed by the Israeli occupation regime, which leads to deluge the Palestinian market with Israeli products rather that local ones. This includes restrictions related to the lack of control over boarders, limitations on production inputs, imports and exports, land confiscation, Israeli exploitation of natural resources (ex. controlling around 80% of Palestinian water resources), Israeli wall, unfair permits regime, and the physical destruction on the Palestinian economic facilities (MoP, 2012, OXFAM, 2015). These restrictions have resulted in increasing costs of imports and exports, productions, and transportation and are thus heavily impacting the Palestinian development process and competitiveness.

4.2 Barriers to Innovation: in Developing Countries and in Palestine

Innovation is one of the keys to success in modern society. It is a critical source for growth and maintaining competitive advantage at different national levels. Despite its importance and effect, innovation in various countries in general and the developing countries in specific faces many barriers, which are usually divided into different categories. For instance, the OECD lists innovation barriers into four categories namely: financial restrictions, market risks, legal and bureaucratic barriers, and restriction within organizations (OECD, 1992). Moreover, the innovation problem can be considered to operate at two different levels, macro level (i.e. economic)

and micro level (i.e. firms/companies). At macro-levels, the most relevant barriers are those related to financial system and regulation; while at the micro-levels, barriers are related to the organizational structures and culture, resources and infrastructure, communication, team dynamics, and individual personality traits (Benmansour and Hogg, 2002).

Financial System

The financial system is "*a system that allows the exchange of funds between lenders, investors, and borrowers. Financial systems operate at national, global, and firm-specific levels*" (O'Sullivan and Sheffrin, 2003). The financial system is needed for innovation to provide the finance required to accommodate a range of resource needs including physical capital, training, marketing, and Research and Development (R&D). The financial system can inhabit innovation in different ways. For instance, a lack or existence of minimal financial support needed to turning innovative ideas into products and services will eliminate the possibilities of advancing the national innovation system which in turn will affect the overall economic growth in the country. In addition, the financial system may be a barrier to innovation when the effective cost of innovation capital is set well above the general level of interest of rates. In this case, the Small and Medium-Sized Enterprises (SMEs) are most likely to suffer from this system as this type of start-ups depend heavily on loans capital from banks for investment purposes (Benmansour and Hogg, 2002).

Regulation

The term of regulation in this research context refers to "*the political and legal actions a government may consider necessary to oversee market activity and the behavior of private actors in the economy*" (Benmansour and Hogg, 2002). In this matter, the OECD (1997) categories regulation into three types, namely, economic, social, and administrative regulation. Economic regulation focuses on improving the efficiency of markets in delivering goods and services. Social regulation is intended to protect the environment and the health and safety of society at large. Administrative regulation aims at governing the practical functioning of the public and private sector (OECD, 1997, 2007). Regulation can put barriers on industrial organizations, especially, on the market in which they can develop and interact with partners. For instance, regulations can make it difficult to companies to minimize costs, reduce time to market, organize in a flexible way, and reduce uncertainty. In addition, absence of regulation to control, boost, and protect innovation in a country leads innovation to be controlled by entities capable of providing the support required to innovation, proportion to its needs only, without considering the overall national needs and/or strategies to promote economic growth.

Major Weaknesses in the overall Environment

Innovation in developing countries, including Palestine, is hampered by weaknesses of other key elements of knowledge-based economies, including educational attainment, business environment, and information infrastructure. Educational levels are low in most of the developing countries and this is one of the significant barriers to innovation. In the pre-industrial phase, educational needs demand only basic literacy; however; in the industrial phase, this requires more professional and medium-level skills. In the post-industrial phase, in turn, there is a need for a significant share of a population with tertiary education, with the rest of the population having at least functionality literacy. Another barrier to innovation is related to the business environment and its related governance conditions in developing countries. A bureaucratic climate that forces an entrepreneur to obtain a hundred authorizations in order to be able to establish her/his new startup is a problem. Moreover, the lack of infrastructure required to innovation is a challenge as well. This includes the limitations on telecommunications, roads and other transport infrastructure, sanitation, water, and other systems (WBI, 2014).

Innovation System

In developing countries, the innovation system is poorly constructed and very fragmented. On the enterprise side, a large number of SMEs operate without being connected directly to the overall economy of the country. On the knowledge side, developing countries have a limited research community. Most universities have systems that are disconnected from local realities, particularly to labor market needs and opportunities, in addition to the lack of a technological support and infrastructure such as quality control and standards. On the government side, there are numerous public-sector institutions to support the promotion of enterprise development, export, foreign investment, etc. With this structure, it will not be easy to establish new, efficient organizations to promote

innovation. However; where this is possible, these organizations will be rarely appropriate, lacking the flexibility and drive crucial for entrepreneurship (WBI, 2014). All these conditions keep innovation systems in developing countries into a low equilibrium trap, with low levels of R&D in the business sector and governments borne most of the national R&D efforts, with questionable relevance for the economy.

The barriers mentioned above make innovation process in developing countries difficult. In addition to these barriers, in the State of Palestine innovation suffers from a series of barriers related to the high cost of new technology and lack of access to finance, inadequate or restrictive government policies and regulations, administrative and licensing procedures, lack of awareness and access to technical information, lack of skilled human resources, and lack of institutions to promote and implement new innovation technology-related projects. A report published by the Palestinian Central Bureau of Statistics (2016), in Arabic, discusses a list of obstacles and barriers to innovation in Palestine as expressed by the representatives of institutions who were interviewed. These are institutions that are mostly involved in regulating the innovation system in Palestine, including governmental, non-governmental, information technology companies, industrial chambers, information technology incubators, and entrepreneur institutions. They all have identifies a set of barriers to innovation, summarized below (PCBS, 2016; MAS, 2017):

1. Absence of an integrated innovation system. Though there are many institutions working in the innovation related fields in Palestine, there is no unified integrated system or framework that regulate the work of these institutions.
2. Insufficient awareness of the importance of innovation. Despite the fact that the Palestinian arena has always been full with innovative ideas, the latter is still considered as a newly tapped field of research in Palestine.
3. Poor and inadequate government support to innovation activities as well as failure to build an effective system to serve the advancement of innovation in Palestine. Currently, there are no financial budget allocations to innovation, including activities related to R&D in universities, or boosting of innovation ideas, or establishment of partnerships with the private sector in joint creative projects to foster innovation. In addition to this, there is a weak legal environment needed to promote and protect innovation, including laws related to patents, copyrights, and intellectual property. There is also limited incentives to stimulate scientific, technological, and innovation research at all levels.
4. Universities in Palestine still depend on traditional educational methods. This hinders the advancement of universities to the level of pioneering institutions that stimulate innovation.
5. Control of Israel over the Palestinian economy. This leads to a series of limitation related to exporting innovative goods and products and, as a result, discourage investors to invest in innovation activities. Moreover, the political instability in Palestine impacts the climate of investment, making it a highly risky environment. This thus weakens the flow of foreign investments that are essential to the transfer of knowledge and technology, that are essential to innovation, to domestic markets.

5 Implementation of SDGs and Innovation in Palestine

5.1 Implementation of SDGs in Palestine

The Presidential decree and the resolution of the Council of Ministers form the base to ensure the government commitment for the implementation of SDGs in Palestine. This resulted in establishing a National SDG Task Force team to lead, coordinate, monitor, and implement the SDGs. The team involves different partners from all sectors to be engaged in the implementation process, including public and private sectors, civil society, universities, NGOs, development experts among others. Moreover, the SDGs were also addressed in the main three pillars of the National Policy Agenda (NPA), the path to independence; government reform; and sustainable development; for the period 2017-2022. The SDGs will be implemented in Palestine through 10 national priorities and 30 national policies. Each national priority is defined under one of the three main pillars of NPA along with its related set of policies. Each policy, in turn, is divided into a list of policy interventions. Table 2 illustrates the link between the main pillars of NPA, SDGs national priorities and policies (Prime Minister Office, 2016).

Table 2: Linking Palestinian national priorities and national Policies to the three main pillars of the National Policy Agenda

Main Pillar of NPA	Related SDGs' National Priorities	Related set of national Policies
1. Path to Independence	1. Ending the Occupation; achieving independence:	1. Mobilizing national and international support, 2. Holding Israel to Account,
	2. National Unity:	3. One land; one people, 4. Uploading democratic principles,
	3. Strengthening Palestine's international status:	5. Broadening Palestine's international participation, 6. Expanding Palestine's bilateral relations,
2. Government Reform	4. Citizen-centered government:	7. Responsive local government, 8. Improving services to citizens,
	5. Effective government:	9. Strengthening accountability and transparency, 10. Effective, efficient public financial management,
3. Sustainable Development	6. Economic independence:	11. Building Palestine's future economy, 12. Creating job opportunities, 13. Improving Palestine's business environment, 14. Promoting Palestinian industry, 15. Escaping poverty,
	7. Social justice and rule of law:	16. Strengthening social protection, 17. Improving access to justice, 18. Gender equality and women's empowerment, 19. Our youth; our future,
	8. Quality education for all:	20. Improving early childhood and pre-school education, 21. Improving student enrolment and retention, 22. Improving primary and secondary education, 23. From education to employment,
	9. Quality health care for all	24. Better health care services, 25. Improving citizen's health & well-being,
	10. Resilient communities:	26. Ensuring community and national security, public safety, and rule of law, 27. Meeting the basic needs of our communities, 28. Ensuring a sustainable environment and adopting to climate change, 29. Revitalizing agriculture and strengthening our rural communities, and 30. Preserving our national identity and culture heritage.

For SDGs localization and monitoring, twelve national working groups were established to support the National SDG team. These groups are led by government entities in close collaboration with the relevant UN partner organizations and agencies. The working groups composed of representatives from academic institutions, private sector, and NGOs with expertise in the relevant SDGs. Each working group, except two, is tasked with one of the SDGs. One of the two exception working groups is responsible for regularly tracking the progress of implementing both, SDG 1 (i.e. No Poverty) and SDG 10 (i.e. Reduced Inequality); the other is responsible for regularly tracking the process of the environmental related SDGs, that are SDGs 12, 13, 14, and 15. As a result of establishing these working groups, the number of stakeholders engaged in the implementation and follow-up of the SDGs increased to exceed 300 from different sectors. The twelve national working groups began their tasks by identifying the Palestinian priority goals and targets for period 2017-2022, including the development of interventions to implement these priorities. The groups were instrumental in developing the first voluntary national review report that was presented at the UN house in New York city in June 2018. The institutional arrangement for the implementation and follow-up of the SDGs is illustrated in Figure 3 (Prime Minister Office, 2018).

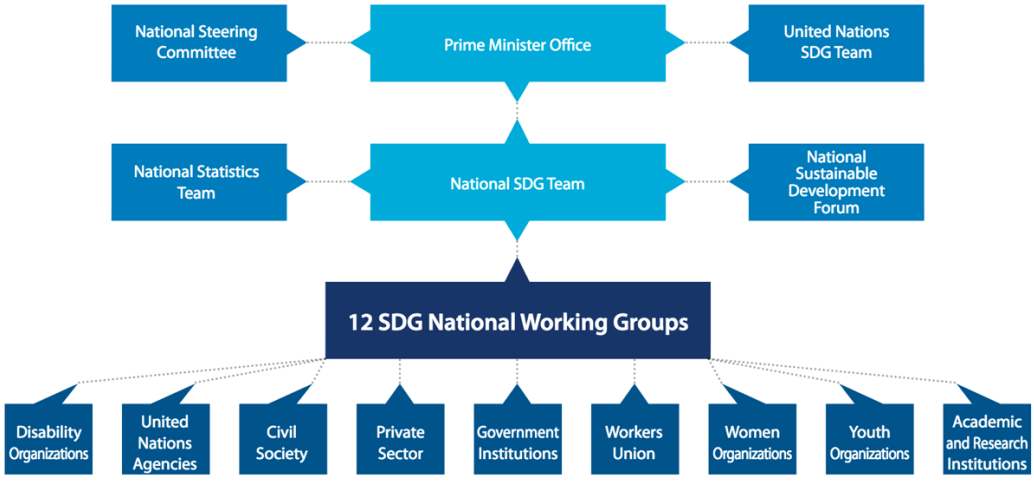

Figure 3: Institutional Arrangement for the Implementation and Follow-up of the SDGs

Monitoring the implementation process of SDGs in essential and should be considered as a major task. Therefore, the PCBS is set to be responsible for monitoring and localizing the SDG indicators. This should be handled in coordination with relevant ministries and national institutions as well as with international organizations, especially the UN agencies that are concerned with these indicators. For this regard, the PCBS has updated its data management structure for the purpose of fulfilling its vision of expanding the use of data from administrative records for statistical needs and integrating data procedure. A total number of 109 indicators are already available to measure the implementation process of SDGs; however; some of the indicators lack categorization, such as gender, regional, and age. The availability and not availability of SDG indicators by goal are summarized in Table 3 (Prime Minister Office, 2018).

Table 3: Availability of SDG indicators by Goal in Palestine

SDG	Availability of Indicators		Total Needed
	Available	Not Available	
1. No Poverty	7	7	14
2. Zero Hunger	5	8	13
3. Good Health and Well-Being	15	12	27
4. Quality Education	7	4	11
5. Gender Equality	7	7	14
6. Clean Water and Sanitation	4	7	11
7. Affordable and Clean Energy	4	2	6
8. Decent Work and Economic Growth	13	4	17
9. Industry, Innovation and Infrastructure	8	4	12
10. Reduce Inequalities	2	9	11
11. Sustainable Cities and Communities	4	11	15
12. Responsible Consumption and Production	1	12	13
13. Climate Action	3	5	8
14. Life Below Water	0	10	10
15. Life on Land	9	5	14
16. Peace and Justice Strong Institutions	10	13	23
17. Partnerships for the Goals	10	15	25
Total	**109**	**135**	**244**

It is also worth mentioning that the national plan of Palestine addresses and working on implement the five critical dimensions of the 2030 Agenda and their related SDGs. This includes people (no poverty, zero hunger, good health and well-being, quality education, gender equality, and reduce inequality), planet (clean water and sanitation, affordable and clean energy, responsible consumption and production, climate change, life below water, and life on land), prosperity (decent work and economic growth and industry, innovation and infrastructure), Peace (sustainable cities and communities and peace, justice and strong institutions), partnerships (partnerships for the goals).

5.2 Innovation in Palestine

The conditions of economy in the State of Palestine deteriorated in 2017 as the growth, mainly driven by consumption, has run out of steam (World Bank, 2018). The national economic has suffered for a long period from restrictions on movement, trade, and access, which kept the levels of investment extremely low, resulting in an erosion of the productive base. The financial assistance provided by the international community have helped in mitigating the restrictions' impacts on growth by fuelling public and private consumption. However, this model of growth is not sustainable and existing aid cannot continue to substitute this poor business environment. The latest statistical studies provided by the Palestine Central Bureau of Statistics (PCBS) shows that the real Gross Domestic Product (GDP) growth in the State of Palestine dropped to a mere 2.4% in the third quarter of 2017, as illustrated in Figure 4 (PCBS, 2018). To face this degradation, Palestinians started to to empower and foster innovation in Palestine.

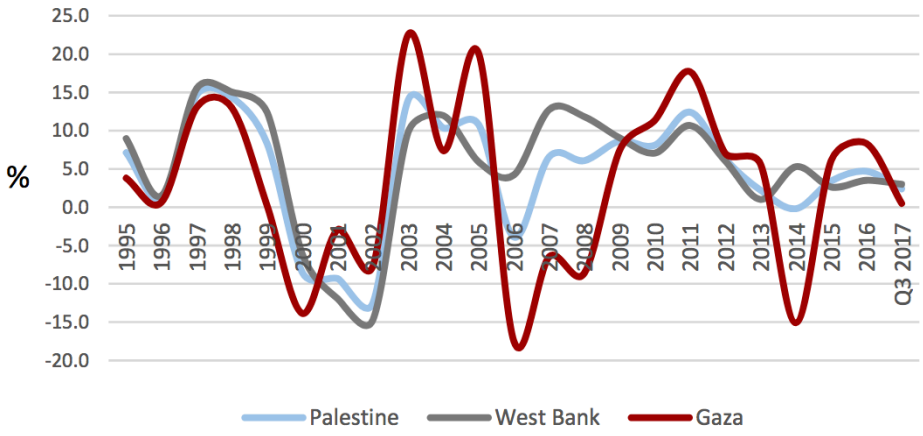

Figure 4: GDP Growth Rate in Palestine, period 1995-Q3 2017

The hard-living conditions in the State of Palestine make Palestinians believe in the power of innovation as one of the main three pillars of the knowledge-based economic, that are education, research, and innovation. In this regard, many well-educated and fresh graduated and passionate young people start establishing their own businesses and converting their innovative ideas into start-ups with the aim of improving their living-conditions and communities. These SMEs are the key to advancing the local economic development in the future. Consequently, different organizations, including national and international ones, are emerging in Palestine to support this trend. The latter includes organizations established by the President office, higher education institutes, private sector, and civil society. These includes, but not limited to, the following:

1. *The Higher Council for Innovation & Excellence (HCIE)*: is a governmental organization established by a Presidential decree with the aim to disseminating and entrenching the innovation and excellence culture amongst the Palestinian people, especially youth.
2. *The Palestine Investment Fund (PIF):* the development-centric sovereign wealth fund in Palestine that seeks to maximize impact through innovation by partnering and investing in cutting-edge strategic projects in vital and under-developed sectors.
3. *Palestine Academy for Science and Technology (PALAST)*: a public, non-profit organization that aims to institutionalizing scientific and technological research in the State of Palestine. The academy promotes scientific discovery and innovative technological advances. It also fosters the use of science and technology in different domains as an enabler to solve various problems through innovative solutions.
4. *Palestine Information and Communication Technology Incubator (PICTI)*: a non-profit, independent organization, which aims at offering business services to Palestinian entrepreneurs with innovative projects in various fields with a focus on technology-driven ones. It provides the support needed to develop the Micro, Small, and Medium-size Enterprises (MSME's) and improves the economic development situation in Palestine through attracting foreign investments and generating of new jobs.

5. *Partners for Sustainable Development*: a non-profit organization aiming at preparing students to acquire entrepreneurial skills through innovation and creative thinking with a focus on the use of ICTs.
6. *Glow Innovation*: a private business accelerator aims at translating innovative ideas into products and services through consultation services, trainings, and financial services for prosperity and better economic.
7. *FastForward*: an accelerator for start-ups where selected promising start-ups are given seed investment, mentorship, and working environment, helping entrepreneurs and innovators to transform their ideas into competitive businesses.
8. *Al Nayzak*: a non-profit organization based in Jerusalem that aims at making scientific-thinking skills an inherent part of the lives of Palestinian youth with a focus on Science, Technology, Engineering, and Mathematics (STEM). The organization provides applicable tools to help individuals acquire thinking skills and being capable for developing their environment and building a modern Palestinian society.
9. *Techno Park*: a non-profit organization that seeks to enhance the technology sector in Palestine by integrating it with global value chains through innovation labs, capacity building programs, hosting multinational companies, and attracting foreign direct – investment; in addition to providing the essential infrastructure needed to enable growth in the technology sector.
10. *Gaza Sky Geeks (CSG)*: a start-up accelerator based in Gaza. It identifies the top start-ups in Gaza, provides them with seed investment, and connects them to trainers, mentors, investors, and other available resources to help them achieve global growth.
11. *Leaders*: a non-profit organization that aims at improving the economic development in Palestine through two types of programs, namely, the socio-economic program and the digital entrepreneurship program with the aim of supporting economic growth, economic self-sufficiency, and sustainability.

Usually the rate of success in innovation of a country is measured using the Global Innovation Index (GII), which is an annual global ranking for countries and economies through innovation measures and outputs. This index ranks annually over 300 countries around the globe, including the State of Palestine. The Index includes two sub-indices, namely, (1) the Innovation Input Sub-Index and (2) Innovation Output Sub-Index. The first Sub-Index is based on five main pillars, that are: Human Capital and Research, Infrastructure, Institutions, Market Sophistication, and Business Sophistication. The second Sub-Index is based on two main pillars, that are: Knowledge and Technology outputs and Creative outputs. Each pillar, in turn, is divided into a list of sub-pillars where each sub-pillar is composed of individual indicators (Cornel University et al., 2019). For Palestine, the Innovation Index is measured by four main indicators, namely, Information Technology Exports, High-Tech Exports, High-Tech Exports - present of manufactured exports, and R&D Expenditure.

Analysing the visions of the above-listed organizations shows that most of them are relying on technology as an enabler to innovation, through which innovative ideas could be translated into real businesses and products to be used in the local, regional, or international markets. According to the UN statistical data, the average value of the Information Technology Exports indicator from year 2007 to 2016 was 0.68% with a minimum of 0.35% in 2015 and a maximum of 1.35% in 2010, as illustrated in Figure 5 (TheGlobalEconomy, 2020).

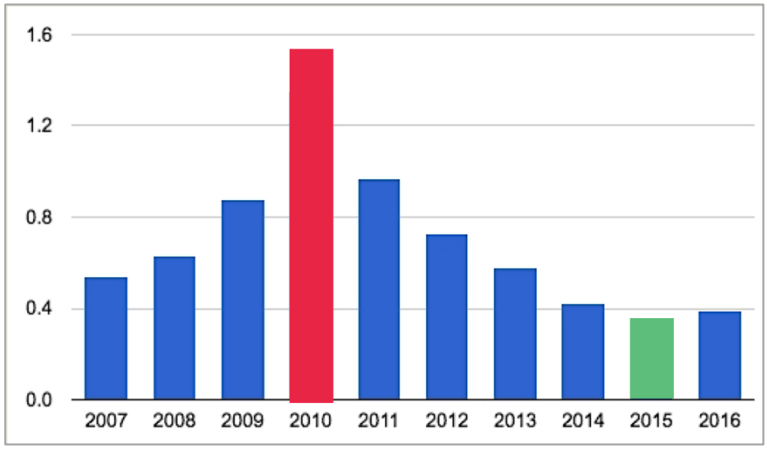

Figure 5: State of Palestine – Information Technology Exports, period 2007-2016

For High-Tech Exports Indicator, the average value for Palestine during the period 2007 – 2018 was 2.17 million U.S. dollars with a minimum of 0.17 million U.S. dollars in 2007 and a maximum of 6.24 million U.S. dollars in 2018. Figure 6 (TheGlobalEconomy, 2020) provides an illustration for this indicator from 2000 to 2016.

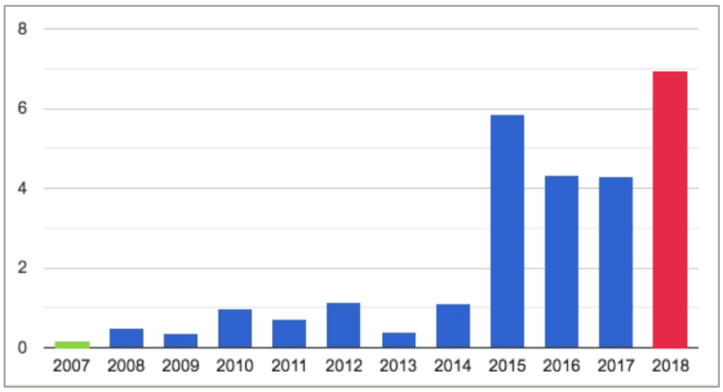

Figure 6: State of Palestine –High Tech Exports, period 2007-2018

The UN data also shows that the average value of the High-Tech Exports, percent of manufactured exports Indicator for Palestine from 2000 to 2016 was 0.32% with a minimum of 0.06% in 2007 and a maximum of 0.96% in 2015, as illustrated in Figure 7.

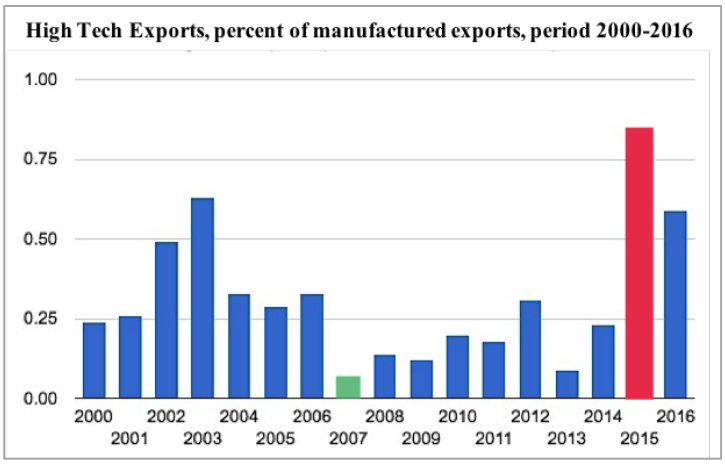

Figure 7: State of Palestine –High Tech Exports, percent of manufactured exports, period 2000-2016

The R&D, in turn, is an indicator and driver for innovation. It plays a big role in the innovation process through the development of knowledge and technology that are essential to producing new services and goods, improving the quality of existing services and goods or finding new ways to produce services and goods. The growing attention paid to R&D returns back to its excellent ability to absorb the increasing number of researchers and postgraduates, as the case in Palestine. In Palestine, there is still inadequate focus given to R&D. However; utilization of human capital could be one of the main productive resources to improve the Palestinian economy. Decision makers in competent government agencies, universities, and local productive sectors should all collaborate to tackle existing socioeconomic problems through R&D. Their efforts in this regard will affect the local economy's development process, especially in the industrial sector, which is being considered as a main issue of building a competitive Palestinian economy, independent of Israel.

A survey report carried by the Palestinian Central Bureau of Statistics (PCBS) highlights different number of R&D indicators in Palestine (PCBS, 2017), as illustrated in Table 4. The report's figures show that the number of R&D personnel in Palestine in 2013 was 8,715, including 4,533 university researchers, administrative staff like managers, administrative assistances who provide supportive tasks needed for the R&D, accountants, technicians,

and skilled professionals. Moreover, the report shows that there are 566 full-time researchers per million inhabitants, which is close to the general average in low and middle-income countries (PCBS, 2017; MAS, 2017).

Table 4: Main Indicators for Research and Development in Palestine, 2013

Indicators	Value
Number of Research and Development Personnel	8,715
Number of Research and Development Personnel with Full-Time Equivalent (FTE)	5,162
Number of Researchers in Research and Development	4,533
Number of Research (Males) in Research and Development	3,510
Number of Research (Females) in Research and Development	1,023
Number of Researchers in Research and Development with FTE	2,492
Number of Researchers in Research and Development with FTW Per Million inhabitants	566
Total Expenditure on Research and Development (USD million)	61.4
Percentage of External Funds for Research and Development	26.9
Expenditure on Research and Development Per Researchers with FTE (USD million)	24.6

According to the World Bank[1], about 53% and 26% of researchers in Palestine are PhD and MA/MS holders respectively. Whereas by sector, the number of researchers in R&D is 4,694 researchers in academic institutions (i.e. 54% of the total number of researchers), 2,873 in public sector (i.e. 33%), and 1,148 researchers in NGO sector (i.e. 13%). By the scientific research field, the number of researchers in R&D are 34.2% researchers that work in humanities, 27.7% in social science, 11% in engineering, 11% in natural science, 5.8% in medical science, and 4.8% in agricultural science as illustrated in Figure 8.

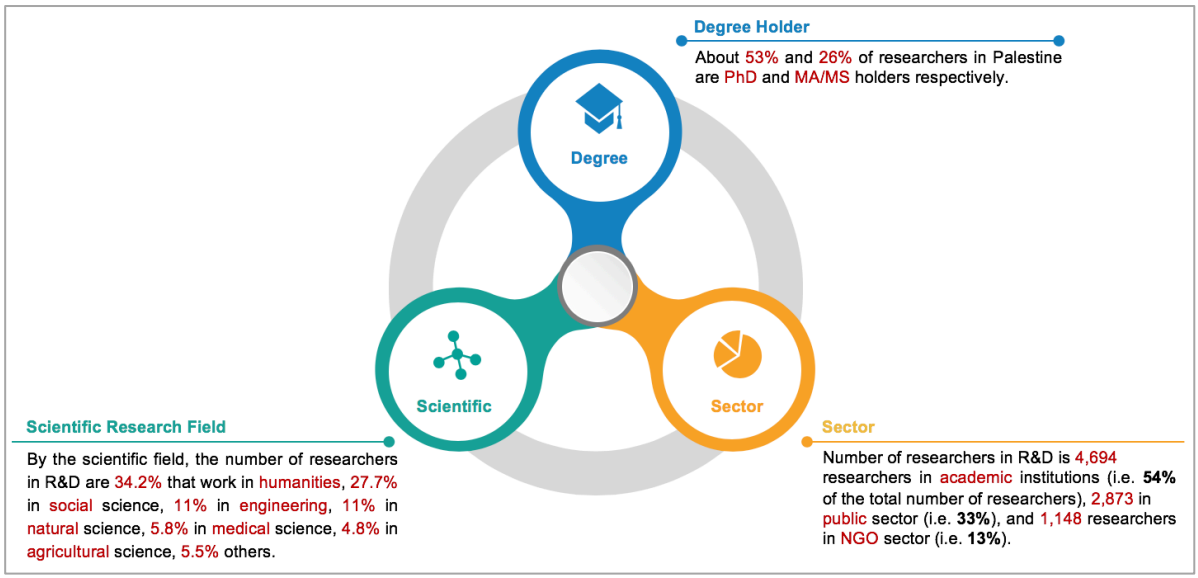

Figure 8: Distribution of Researchers based on Degree, Field and Sector in Palestine

On the other hand, the R&D expenditure reached 61.4 U.S. million dollars in 2013, that is 0.49% of Palestine GDP – Gross Domestic Product in 2013 (TheGlobalEconomy, 2020), which is very low compared to many other Arab countries. This low value is related to the inadequate financial resources and weakness of interest and awareness on the importance of R&D as a major lever for the economy by different parties. In this regard, the statistical studies show that the share of public sector spending amounted to 65.1% of the total expenditure, followed by universities with 23%, and non-governmental organization with 20.9%. In relation to the R&D funding resources, the biggest amount was 26.9% counted to the external support, followed by the governmental agencies support of 22.3%, non-governmental organizations support of 21.8%, self-financing of 18.7%, and finally 4.1% support from academic institutions, which the lowest amount (MAS, 2017).

[1] The World Bank, https://data.worldbank.org/indicator/SP.POP.SCIE.RD.P6?locations=PS

As illustrated in Figure 9 (TheGlobalEconomy, 2020), the average value of the United Nations R&D expenditure, percent of GDP, indicator for Palestine from 2007 to 2013, was 0.33% with a minimum value of 0.16% in 2008 and a maximum value of 0.49% in 2013. It is worth noting that data from 2014 to 2017 is not available.

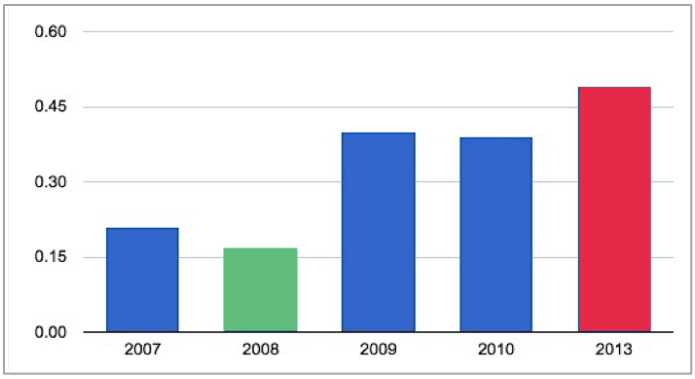

Figure 9: State of Palestine – Research and Development Expenditure, percent of GDP, period 2007 – 2013

6 Discussion and Recommendations

It is clear that innovation on the ground of Palestine is modest. Despite availability of a number of organizations to support and enhance the innovation spirit, innovation is unable at present to act as a lever for the Palestinian industry. It cannot even enable the competitive advantage needed by the different national economic sectors. This pose major impediments for achieving SDGs. Therefore; there is a need to consider adopting a set of strategies and policies to stimulate innovation ecosystem for achieving SDGs in an efficient and cost-effective manner and providing the necessary internal and external enabling environment.

To face the weaknesses in existing innovation system, this research paper provides a list of recommendations to be considered by different local economic sectors in Palestine, including the government agencies, governmental regulation bodies, universities, and private sector. The list of recommendations is summarized below:

1. *Build a strong and effective national innovation system*, this system should be built based on partnership between the government, academia institutions, and the private sector and to be adapted from current international best practises. In this context, it is important to bring attention to the role of the Higher Council for Innovation & Excellence as a governmental body.
2. *Safeguarding intellectual property at the national level*: this includes modernizing the Palestinian legal environment to be in line with international standards, in addition to joining international conventions and organizations related to intellectual property. There is also a need to raise awareness and knowledge regarding the intellectual property concepts as well as qualify and empower cadres and build capacities related to it.
3. *Compiling the Global Innovation Index for Palestine*: the importance of this Index is related to its the ability to measure the different innovation and entrepreneurship capabilities of the various elements of society. It also helps in measuring the competitiveness of the national industries and overall economy and compare them with Arab and other countries. Despite the availability of the Palestine Innovation Index that is measured by the PCBS, the index does not cover all indicators identified in the GII.
4. *Expand attention to human capital*: without having a "fertile soil" for innovation, there could be no growth. There should be an improvement in the quality of the basic education in Palestine through education programs that deliver STEM skills and entrepreneurial thinking to young innovators. These skills will help youth for future education and employment. It is the responsibility of the government to enable and encourage public domestic universities and private universities to not only train world class students but also being able to conduct research and product development activities in partnership with national and international organization and private sector.
5. *Increase Incubators/Accelerators and sources of financial funding*: the importance of incubators and accelerators is related to their capabilities in bringing together innovation actors by providing a needed space and venue to collaborate, engage, and strengthen ideas. This type of platforms is important for sectoral

innovation, where strong incubators can provide a diverse array of supporters, including universities and for-profit companies. These incubators could be hosted at universities or be part of their system. Both incubators and accelerators provide the help needed to start-ups in their early launch while ensuring they contribute value to the national innovation ecosystem. Therefore; incubators and accelerators are responsible, as others, for maintaining the present and future needs of innovation in Palestine.

6. *Develop a comprehensive plan to finance and stimulate R&D*: in the first stage, the Palestinian government should be a primary contributor to achieve this goal, which encourage other contributors, such as the private sector and international fund organizations, to increase their spending on national R&D. This also includes tax reduction and/or tax exemptions for companies that invest in R&D, especially for those that aim at striving to register patents or develop domestic products with a competitive advantage.
7. *Set a national fund dedicated to support R&D*: this is achievable through public-private funds and from international public and private contributions. This fund should be linked directly to a national research and development information center for R&D, which is responsible for identifying the private sector needs and the possible sources of funding. These activities could be used then by universities and existing research and development institutions through graduation projects and master's and doctorate's dissertations in addition to the research conducted by universities and research institutions' staff.
8. *Encourage collaboration between universities and private sector*: this includes creating an enabling environment to stimulate partnership between universities and the private sector though joint research projects. Universities in this regard should reform the higher education system to be in line with market and private sector needs of knowledge and technology. On the other hand, the private sector should also be encouraged to be open to the academic sector to benefit from the large knowledge and research production as, in all countries around the world, universities are considered as a major, inexpensive source for knowledge and innovation needed by productive sectors.
9. *Encourage technological innovation*: this is one of the major forces in economic growth. Adopting innovative technologies could rationalize the use of natural resources, reduce operational costs, increase efficiency, and create more new jobs in Palestine. This helps in strengthening the national economic development and growth. Moreover, each component of the SDGs has at least one technology component. Thus, it is important to create an adequate environment to support technological innovation for both the improvement of the national economic and facilitate achieving the SDGs.
10. *Provide more indicators to measure innovation and R&D*: the PCBS should provide periodic indicators for innovation and R&D in line with the global standards. This helps in measuring the periodic situation of Palestine in these areas as well as providing the motivation needed to enhance the national innovation and R&D to be able to compete with Arab and other countries. Without indicators, the situation under these areas will be hazy and dependent on studies published by international agencies or some national research centers that may not provide the right analysis and data that reflect the true situation.
11. *Raise public awareness on SDGs*: the government of Palestine did not make enough effort to raise the public awareness on the necessity of implementing the SDGs in Palestine. The undertaken actions by the national team were ad hoc and focused on governmental (internal) awareness raising. The actions taken, in stage one, are still focusing on setting institutional arrangements in action as well as building commitment and awareness among main stakeholders, including the government, private sector, civil society among others. Therefore, engaging citizens from all levels in the implementation process is a must. This will help in underpinning the implementation of SDGs in Palestine through public support, where individuals and public groups can provide and implement innovative projects to serve the SDGs implementation process (SAACB, 2018), which in turn affect the economic development.

Conclusion

The State of Palestine, as a member State of the United Nations, adopted the 2030 Agenda for Sustainable Development. The Sustainable Development Goals (SDGs) is one of the main components of this Agenda, which detailed through targets related to the main pillars of sustainable development, namely, economic, social, and environment. Consequently, the Palestinian government established a National SDG Task Force via a resolution of the Council of Ministers based on a Presidential decree to start implementing SDGs in Palestine. The government also start aligning its national strategies with the SDGs and cross sectoral strategies in the National Policy Agenda of the period 2017-2022. However; achieving the SDGs is challenging, especially in Palestine as

a state under occupation. Therefore, Palestinians start investing in human capital and support innovation due to its impact on economy and its role in achieving the SDGs. However; innovation faces a set of challenges in Palestine and there is a need to adopt adequate policies and strategies to support the national innovation ecosystem. This research paper summarizes the main components of 2030 Agenda with a focus on its SDGs. It highlights the challenges facing the implementation of SDGs in developing countries in general and in Palestine in specific along with a list of barriers to innovation. The impact of innovation (i.e. Goal 9 of the SDGs) on the economic growth (i.e. Goal 8 of the SDGs) is discussed. The situation of the implementation of SDGs and situation of innovation in Palestine is demonstrated as well. The paper concludes with a list of recommendations to be taken by decision makers at different parties in Palestine. This paper forms a base for more studies related to the 17 goals of the SDGs and how each goal could be implemented in the Palestinian environment in a way to improve the overall quality of life of citizens, services and operations, and competitiveness. This also includes a roadmap and framework to enhance innovation ecosystem in Palestine.

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