**DRAFT CHAPTER**

**Rethinking Economics
and Sustainability in the Anthropocene**

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Abstract

The goal of the economic development is reached as a result of the higher usage of production inputs on qualitative and quantitative levels, and this situation brings the issue of environmental protection to a more debatable point, especially for future generations. Environment-related problems should be evaluated on a global level, and they should be discussed by keeping in mind the fact that they are in an interaction with each other. Increasing the living standards of individuals by considering the limits of the planets and integrating these limits with the social limits has given rise to discussions over the concept of doughnut economics for the 21st century. In this context, this study discusses environmental problems under the framework of the main emphases and theses of sustainable development and doughnut economics, and beyond economic development.

**Keywords:** Sustainability, Circular Economy, Growth, Development, Doughnut Economics

**JEL Codes:** Q01, O10, O44, Q57

### 1. Introduction

#### The current era is a period where the existence and effects of problems originating from climate change and global warming are more noticeable and worrisome at some point. The intensity and severity of ecological crises have a challenge for individuals to face. Environmental problems put at risk the lives of both current and future generations on the national, international, and global scale. Therefore, it is crucial to evaluate the problems efficiently and to find the solutions by taking into account the trade-offs between economic growth and environmental issues.

#### When environmental problems are evaluated through the system approach, it is discerned that changes experienced in the environment are, in a complicated fashion, interrelated to other societal crises, risks, and vulnerabilities. In the presence of such an interrelationship, for instance, should the priority be to solve poverty and inequality problems or to find a solution to problems stemming from environmental issues (climate change, deforestation, ozone layer depletion, and so on)? The answer to these questions differs at national, regional, and global levels. Especially when global sustainability is considered in terms of energy production and consumption, the necessity of societal transformation should be highlighted. Such a societal transformation requires the participation of each actor, the effective use of information and technology, and the assumption of joint responsibility for policies and actions at national and global levels, in other words, societal transformation necessitates the significant alteration of socio-ecological systems (Hackman and Moser, 2013).

#### As a comprehensive approach, system integration makes it easier to deal with various aspects of systems belonging to humanity and nature (socio-ecological and human-environment relationships), examine their complex interdependencies in a more appropriate way, and produce solutions that will support sustainability. A system-based point of view will especially lead to the emergence of strategies and policies that will support the achievement of sustainability on a global level (Liu et al. 2015).

#### What should be understood from climate change is important, and regardless of whether it is addressed from a social, economic, or political perspective, certain uncertainties and obstacles come out about what sort of a problem climate change refers to. For instance, greenhouse gas emissions can be produced as a consequence of almost every kind of human activity or the majority of economies are highly dependent on fossil fuels. In this situation, what should be the responsibilities of countries that produce greenhouse gas emissions at considerable amounts? In answering this question and other similar questions, the first step to be taken is to accurately identify what sort of a problem climate change is. From a certain perspective, this is a hard decision, and from another perspective, it is also a political decision as answers that focus on different costs and benefits for different groups are political by nature (Hoffmann, 2013).

#### Climate policies are usually designed by focusing on climate-related strategies (pricing policies, regulations and norms, supporting green technologies and innovation). However, as much as these instruments and strategies, the support of the decarbonization of the economic system in economic development and fighting poverty is also required for a successful outcome (Fay et al., 2015:20). For countries that are dedicated to fighting global warming with their goal of zero (net) emissions, it will not be sufficient to only focus on reducing carbon emissions in the achievement of this aim. At this point, thinking of not only the natural system of the world but also the economic system as a whole with the circular economy approach will provide greater support in the way to a solution to problems such as climate change, drought, floods, erosion, and loss of biodiversity (Ishii, 2021).

#### Today, there exists an era of economic growth that is shaped by global inequalities and poverty. According to the World Bank (2020:27), with the added influence of COVID-19, it is expected for 88-115 million people to fall into extreme poverty by 2020. However, it should not be forgotten that climate change is also among other factors that are influential on poverty. It is expected that 68-132 million people will fall into poverty by 2030 due to the accumulating effects of climate change. Four in every five people living under the global poverty threshold live in rural areas, and 132 million global poor live in regions with a high risk of overflows/flooding. People who are facing several risks that can be caused by climate change consist mainly of the poorest groups.

#### It is estimated for the world’s population to reach approximately 10 billion in 2050. Can the existing consumption and production patterns provide sufficient resources for such a large population? Or, with the increase in emission volumes considering again the existing consumption and production structures, will it be possible to overcome environmental pressures? At this point, among climate policies, transition to renewable energy[[1]](#footnote-1) or adopting the circular economy model is among the most prevalently preferred strategies (van Veldhoven and Schmidt, 2021).

#### Circular economy is explained as a philosophy about minimizing environmental effects/loads by reducing the demand for energy and raw materials and increasing the output and operations (Bimpizas-Pinis, 2021; Moreau et al., 2017). Circular economy aims to disrupt off-the-self and throw-away consumption and production patterns and ensure that products, components and materials are used with the highest utility and value in the process from production to consumption. It is an approach about the more effective utilization of resources through methods such as reuse, refabrication, renewal, and recycling (Bocken et al., 2017).

#### Practices associated with circular economy can be carried out on a level of individuals, firms, or countries. Strategies like reshaping consumption (associated with the value chain and demand), redesigning products (especially in a way to make recycling easier) and transforming the heavy industries may be adopted. In summary, circular economy is encountered at every stage of the product that can be found in the value chain including the product’s design, its use, raw material supply, recycling, and waste management (Ishii, 2021).

#### Circular economy strategies provide economic opportunities, social and environmental benefits as much as reducing greenhouse gas emissions does. They not only lower the costs of people’s access to goods and services but also increase resilience against the physical effects of climate change (such as the ability to separate economic activities from raw materials that are susceptible to the climate crisis) (Ellen MacArthur Foundation, 2021).

#### Circular economy can be seen as a way of gathering planetary boundaries and economic models in sustainability by promoting SDGs and sustainable development (NEA/HCH/NL, 2020; Berg et.al, 2018). In essence, circular economy supports the achievement of sustainable development goals. It has effects like increased air quality, protecting biodiversity, and reducing water pollution. In the fight against climate change, it is observed that in general, firms and countries prefer to focus on renewable energy resources and energy efficiency. Nevertheless, while these are among strategies that are compatible with circular economy, only 55% of greenhouse gas emissions can be reached with these methods. In its essence, circular economy accomplishes the reduction of emissions by transforming the production and use methods of products (Ellen MacArthur Foundation, 2021).

### 2. Growth, Development and Sustainable Development: Some Controversial Issues

#### The concept of development should be discussed with a combination of both economic and non-economic factors. In addition to an improvement that can only be seen in economic conditions, it should also include an improvement in all areas of an individual's life (Doğaner-Gönel, 2013:5). The main focus is to ensure a decent living standard that befits human dignity and increase social welfare without any discrimination in the society (Toksöz, 2011). Expanding the basic freedoms of an individual also means a struggle against all kinds of conditions and factors that confront them with poverty, inequality, and deprivation, and that limit their basic abilities (Sen, 2004).

#### In the 1950s and 1960s, the concept of development, which was considered synonymous with growth policies and focused on quantitative changes rather than qualitative changes in economic performance, turned into a concept that aims to achieve justice in income distribution, fight against poverty, improve the quality of institutions and protect the environment in a more inclusive and deeper context throughout the period that reaches today (Aysan and Dumludağ, 2014; Rabie, 2016). While economic growth is the expression of an increase in the production rate or income of a society, development is about the social, political and institutional changes and transformations that take place in that society (Doğaner-Gönel, 2013:10). In a successful development process, it is observed in the relevant society that an increase in industrialization and decrease in the share of agricultural sector in the output, a change in the trade structure (products with more added value, etc.), production relying on know-how and human capital more, and basic institutional transformations are realized (Cypher and Dietz, 2009:21).

#### While evaluating the performances of countries in terms of economic growth and development, GDP, GNP or their per capita values are used as the most common criteria. However, these indicators bring along some limitations in measuring economic activities and welfare. A measurement based on GNP or GDP, no matter which indicator is chosen, may be inadequate in terms of solving problems stemming from economic growth due to its focus on output growth. The most important problems are regarding the following: the elimination of the effect of inflation (inclusion of products in the price index with a correct weighting, the share of public services and the private sector in the economic structure, etc.) and reflecting the changes in product quality and diversity (especially due to innovation) (The Economist, 2016). Excluding domestic work (child and elderly care) and ignoring the positive and negative effects of economic activities on the environment[[2]](#footnote-2) (such as pollution and erosion) should also be included in the areas where economic development and social welfare are lacking (Rohner, 2018).

#### As Lepenies (2016) and Stiglitz (2009) stated regarding alternatives to GDP, the answer to the question of what kind of society we would like to live in will be decisive. In this age, when the effects of climate change are encountered more frequently, methods that try to realize and assess an economic structure in which incomes and wages can be distributed more fairly may be good alternatives. In other words, sustainability and social welfare and well-being need to be more accurately correlated and included in analysis. What should not be forgotten here is that it has become inevitable for today's economies that the trade-off between the protection of environment and increase in output is more traceable.

#### On the subject of sustainable development, which is a multidimensional concept, the interrelationship between environment and development is highlighted by the Brundtland Report, dealing with the relationship of environmental pressures with each other and the relationship between environmental pressure and the type of economic development under the assumption that they are all related to many social and political factors. The emphasis is on meeting the needs of current generations without compromising future generations' ability to meet their needs. One remarkable point is both emphasizing the basic needs at the individual/societal level and highlighting the fact that the environment is somewhat restrictive on the capacity to meet these needs. For this reason, it is emphasized that the goals regarding economic and social development must be handled and defined in the context of sustainability (UN-WCED, 1987).

#### Griggs et al. (2013) defines sustainable development in the Anthropocene era as meeting the needs of the current generation while preserving the life-supporting systems of the world on which the well-being of both current and future generations depends. Considering this definition, at the time what needs to be done regarding the development of individuals (end poverty, universal education and health, gender equality, environmental sustainability, global cooperation) and the sustainability of the planet's existence (clean air, biodiversity, resource use, nutrient cycle, hydrological cycle, ecosystem services) are fulfilled, the sustainable development goals in line with the new definition will also be realized.

##### Figure1: The Linkages Between Climate Change/(Policies) and Sustainable Development/(Policies)

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##### Source: Swart et al., 2003.

#### The strong relationship between climate change and sustainable development can also be observed in the Figure 1. When considered in terms of climate change, the conditions that cause it and its effects are closely related to the three basic dimensions - economic, environmental and social - that make up sustainable development. Policies to be followed in both areas should be created in a way that they take into account this mutual relationship and interaction (Swart et al., 2003). At this point, Robinson et al. (2006) emphasize that sustainable development can offer climate policy goals that are more efficient than climate policies themselves (on the one hand, providing a lower level of carbon emissions and a sustainable future, on the other hand, climatic goals emerge as a by-product). The IPCC (2007) study also highlights the dual relationship between sustainable development and climate change. The impact of climate change on the living conditions of individuals and nature will affect social and economic development, and a society's priorities regarding sustainable development will actually affect indicators such as greenhouse gas emissions that cause climate change, risks and vulnerabilities in these areas.

#### Sustainable development actually tries to achieve three main goals such as economic, social and ecological development, all together at the same time. Stricter definitions of sustainable development, on the other hand, claim that there is a hierarchy between these goals and therefore ecological and social ones should be given priority (Rashid, 2020). 17 sustainable development goals and 169 objectives that elaborate these, adopted under the umbrella of "The 2030 Agenda for Sustainable Development", which make development goals of the millennium move further forward, emphasize the inevitability of achieving a balance in all these three economic, social and ecological layers of these priorities, which are integrated and inseparable in terms of our planet, our people and our well-being. Objectives related to the existence of humanity and the planet, peace, cooperation and common welfare have been put forward (UN, 2015b).

#### The existence of sustainable development goals is actually an expression of a transition from treating poverty and underdevelopment as separate phenomena from environmental problems to accepting that these two are closely related. When sustainable development goals are considered at the integrated level, it should not be forgotten that the goals on an individual basis would create effects that may conflict with each other (energy supply and combating climate change). It is necessary to point out the two points at which the sustainable development goals conflict. These consist of a combination of goals emphasizing the necessity of economic growth for human development as well as goals for the protection of the planet on the basis of harmony with nature (Hickel, 2019:874; Griggs et al., 2013).

### 3. How Did the Concept of Doughnut Economics Emerge?

#### Doughnut economics can actually be considered as a solution for ensuring social welfare and economic development together in the era of social inequalities and environmental degradation/pollution. It offers important suggestions on how the 21st century can be planned with an alternative to mainstream economic thought (providing social welfare, realizing the goal of economic growth, and protecting the environment). It investigates the existing economic rules and operations through the dynamics of the capitalist system and its transformation into a structure where wealth is distributed instead of being growth-oriented and ecosystems can reproduce themselves (Ceil, 2018).

#### Doughnut economics in the Anthropocene emerges as an important roadmap for the twenty-first century and a method that supports the restructuring of economic and political decision-making processes, with its structure emphasizing that the well-being of people depends on the well-being of the planet and revealing the severity of inequalities within and between countries arising from current social and environmental conditions (Raworth, 2017a). According to Stopper et al. (2016), Doughnut economics, which is one of the modern models in terms of sustainability or sustainable development, actually divides global interactions and interdependencies into smaller ecological and social parts that can be easily acknowledged, and thus facilitates the recognition of the boundaries that a sustainable economic system encounters through various parameters.

#### The emphasis of the doughnut economics is actually a proof that in the 21st century, there is still the opportunity to achieve sustainable development goals on one hand and strategies and mechanisms to reduce emissions at the global level on the other. The doughnut economics is an example of a closed system limited to both basic human rights and environmental sustainability. The area between the environmental ceiling and the social foundations represents the livable, safe and fair area for humanity (the area/space where inclusive and sustainable development will be achieved). The existence of this area is an expression that the well-being of both humanity and the planet is achieved, and that their interdependencies are taken into account. The environmental ceiling highlights a point that should not be crossed by us, namely, the boundaries of the planet (climate change, freshwater use, nitrogen and phosphorus cycles, ocean acidification, chemical pollution, ozone depletion, aerosol condensation in the atmosphere, biodiversity loss, land use). Similarly, it is possible to encounter serious deprivations at a point below the social foundations. In the context of human rights, a limit is drawn that no one living in the society should fall under. With the existence of twelve basic areas such as access to energy and clean water, food safety, health, education, income and employment, peace and justice, participation in social decisions and being able to be heard, social justice, gender equality, housing and shelter, and social networks, basic social standards that the individuals have self-respect and are able to access opportunities are achieved (Raworth, 2012).

### 4. Green Growth Strategies (Policies)

#### Green growth means that, without having any decrease in the total natural capital, economic activities increase in the short term and particularly in the long term. The growth part of the concept generally refers to the GDP while its green part pertains to the protection of the value of the total natural capital. Upon the review of green growth definitions, it is discerned that they are closely related to the concept of sustainable economic development. On the other hand, green growth refers to a wider concept to include the use of natural resources and environmental effects in a way to transcend targets such as achieving low carbon emissions or reducing climate change (Bowen and Hepburn, 2014).

#### Just as sustainable economic development, green growth is as well in an effort to show that the environment is not protected at the expense of welfare and prosperity. Green growth suggests that the protection of the environment just as the compatible relationship between environment and economic growth will bring about a better economic growth performance. The green growth theory states that the cost of fighting the environmental damage is not too high at all when the natural growth rate of an economy that performs well falls to zero. If the environmental damage cannot be eliminated, the cost of a worsening environment will be even higher (Jacobs, 2013).

#### Green growth refers, in its most general sense, to the transformation of present production and consumption models at the global scale. Policies to support green growth can be implemented in several areas ranging from pricing (carbon tax, environmental taxes, and so on) to market regulations (energy efficiency), incentives (supporting the use of green technology, products, and processes instead of resources harmful to the environment), and the shaping of consumer behaviors (OECD, 2015). Theories about green growth emphasize that an economic expansion that is consistent with the ecological system of the world can take place (consistent with sustainable development goals), and by virtue of the technological development, the GDP growth can be decoupled from the resource use and carbon emissions. However, Hickel and Kallis (2019) underline that empirical studies did not confirm the green growth theory, and hence, actions should be taken in light of other alternative strategies.

#### The challenge in producing green growth strategies and policies is that their beneficial welfare effects come into play in the long term whilst transition costs render the implementation of these policies and strategies difficult in the short term. Both the harmonization of policies and the selection of indicators and tools to measure the effectiveness of implemented policies are among the basic problems. Even if pricing tools are used in general, they should be supplemented with incentives or arrangements that address market failures. Countries generally make more efforts to invest in infrastructure and harmonization policies, however, both public and private finance should be used in these areas. Taking steps to compensate for those losing due to the implemented policies is also important. Green growth can be considered as a subset of sustainable economic development. Policies, which are consistent with flexible ecosystems in support of conditions necessary for innovation, investment, and competition that will pave the way for a new economic growth path, find their places in economic growth (OECD, 2013a).

#### The barriers blocking green growth differ depending on the economic development level, socioeconomic context, and existing economy and environment policies. Table 1 displayed these barriers ranging from the lack of infrastructure to externalities and incentives.

##### Table 1: Green Growth Constraints and Policy Options

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| **Green growth constraints** | **Policy options** |
| Inadequate infrastructure | Taxes |
| Tariffs |
| Transfers |
| Public-private partnerships |
| Low human and social capital and poor institutional quality | Taxes |
| Subsidy reform/removal |
| Incomplete property rights, subsidies | Review and reform or remove |
| Regulatory uncertainty | Set targets |
| Create independent governance systems |
| Information externalities and split incentives | Labelling |
| Voluntary approaches |
| Subsidies |
| Technology and performance standards |
| Environmental externalities | Taxes |
| Tradable permits |
| Subsidies |
| Low returns on R&D  | R&D subsidies and tax incentives |
| Focus on general-purpose Technologies |
| Network effects  | Strengthen competition in network industries |
| Subsidies/ loan guarantees for new network projects |
| Barriers to competition | Reform regulation  |
| Reduce government monopoly |

##### Source: OECD, 2011:9.

#### Producing green growth strategies at the national level[[3]](#footnote-3) requires coordination between institutions, participation of the private sector, and an accurate definition of long-term goals and indicators. An environmentally-friendly growth path necessitates the establishment of a balance between the predictability of long-term targets and the flexibility of strategies selected for implementation (The World Bank, 2012). Understanding how to manage short-term trade-offs between environmental policies and harmonizing them with long-term interests are also of importance. Developing countries will use their natural endowments in the economic development process. Green growth is what decision the country takes/where the country stands in relation to the use of these resources and where the society wants to be in this regard in the long run. Green growth does not solely mean the protection of nature, rather, it is about not regretting the decisions taken to provide natural resources that are needed to make economic development sustainable in the long run (OECD, 2013b).

#### Green policies and practices contribute to economic growth through three mechanisms: The increase in factors of production (such as the increase in human or natural capital), the effectiveness of the factors of production, and the innovation-supporting structure of the factors of production. It ensures that welfare gains that are not based on economic growth also emerge. Environmental policies enhance societal welfare and economic efficiency. However, it should also be borne in mind that they are costly (The World Bank, 2012).

### 5. Conclusion

#### In the context of sustainable life and economy, the concepts of green economy, circular economy and doughnut economy are frequently referred to. It is seen that the concept of sustainability is the basis of all these approaches. These concepts can be considered to be parts or components of sustainability models. This way, it will be possible to manage the process of transitioning to a new model from the dominant model/philosophy that is focused merely on growth. In today’s economies, where economic growth is the main objective, the degree and form of utilization of the environment and natural resources that are among the inputs of this growth will be effective on both current and future performance.

#### While the Circularity Gap Report emphasized that cyclicality[[4]](#footnote-4) existed in only 9.1% of the global economy in the year 2019, 62% of greenhouse gas emissions occur at the stages of acquisition, processing, and production. The meaning of this ratio is that only about 9% of the 92.8 trillion tons of minerals, fossil fuels, metals and biomass included in the economy can be applicable to reuse annually. Strategies that can be adopted to increase cyclicality may include increasing the utility of the product by maximizing its use and life cycle, supporting recycling, considering wastes as resources, and establishing a cyclical design with low-carbon alternatives by reducing the consumption of materials (The Circle Economy, 2019).

#### It was expected that in the Anthropocene period, which is prominent as an era in which the effects of humans and all activities of theirs, the size of man-made objects would exceed the total weight of all living beings on the earth by the end of 2020 (Briggs, 2020). The Anthropocene, which refers to the era after the Holocene, is explained as an era in which humanity facilitates and shapes changes that occur on a global scale to a higher extent than all other factors -especially those arising with the course of nature itself. According to Crutzen (2002), the beginning of this era can be traced back to the 1800s, that is, the Industrial Revolution. While the lifestyles and economic activities of preindustrial societies used to be influential on the environment, it was seen that this effect usually remained within the range of the natural variability of the environment (in a local and transient sense) (Steffen, Crutzen, and McNeill, 2007).

#### According to the report of the IPCC (2021), greenhouse gas emissions caused by anthropogenic activities are the main cause of a 1.1°C increase in global temperatures since 1850-1900. It is expected that this rate of increase will reach or exceed 1.5°C in future years. Climate change does not only mean living in a warmer world and under the effects it will create. It can also result in the observation of highly variable effects on different regions (e.g., intensification of the water cycle, effects on precipitation patterns, warming and acidification of the oceans, melting of glaciers).

#### Developing countries are more vulnerable to environmental threats. Unsustainable destruction of natural resources, lack of basic infrastructure, inadequate access to water, energy, and food, fast population growth, urbanization-related clean air and freshwater problems, dependency of rural life on natural resources, and high vulnerability to the incidents of climate change are generally at the origin of these threats. Therefore, in developing countries, the relationship between environmental performance, inequality, and poverty emerges more visibly and directly (OECD, 2013b). There is also an unequal structure about who contributes to carbon emissions to a larger degree. The contributions to be made by rich and impoverished countries to the reduction of carbon emissions or achievement of production and consumption levels that will bring the level of global warming to the desired value will affect both groups of countries differently. It is important to consider climate policies also from this perspective.

#### We are living in an era in which the effects of problems caused by global warming and climate change have started to be more intensely encountered. The levels of the interactions of environmental factors with each other and their interrelations could increase the size and magnitude of negative effects that might arise even further. Economic development and existing production-consumption models have an intensifying effect on pressures on the environment and increase the frequency of ecological crises. Achieving economic growth in an environmentally sensitive manner, green growth, doughnut economy and circular economy are proposed as alternatives to the existing growth models in this context. Accordingly, it is possible to find significant differences between the Global North (rich) and Global South (poor) regarding the policies they implement and the strategies they follow. Acting with an integrative perspective that combines both the right to live humanely and the capacity of the earth to renew itself, rather than an economy focused solely on an increasing GDP, becomes inevitable on the national and global levels.

#### Be it circular economy or doughnut economy, all these new approaches point to the realization of a substantial transformation in conventional/direct models, that is, forms of production and consumption.

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Main Title of the Paper: 16 Punto Bold

1. Renewable energy sources and policies can help countries to reduce greenhouse gas emissions and to support their sustainable development goals (Uğurlu, 2019; Dinçer, 2000) but the planning and implementation of this energy (Spillias et.al, 2020) might also undesired outcomes for environment and sustainability. It should be kept in mind that there might be a trade-off between these goals. [↑](#footnote-ref-1)
2. A variety of views come out about environmental constraints imposed on economic growth. In this respect, three common views come to the fore, that is, the economic growth being unlimited, the decelerating effect of environmental factors on growth, and lastly, the economic growth not continuing ad infinitum (Hepburn and Bowen, 2012). [↑](#footnote-ref-2)
3. In this context, the effect and responsibilities of central banks are also discussed. In general, a balance sheet in support of the transition to a low carbon economy and activities fighting climate change can be preferred (Boneva et al., 2021). Monetary policy transactions can be greenized and directing asset and liability transactions toward low carbon assets can be supported. Again, an important point is that, just as the real effect of asset purchases of the central bank on the total output, their distribution across sectors affects the climate (Papoutsi et al., 2021). The above-mentioned environmentally-friendly policies and tools indicate that the powers of the central bank should be changed in a manner to facilitate the fight against climate change and the transition to a carbon-neutral economy (Schnabel, 2021). [↑](#footnote-ref-3)
4. In the report for 2021, this rate was stated as 8.6% (The Circle Economy, 2021). [↑](#footnote-ref-4)