

# Social Dimension of Air Transport Sustainable Development

Dimitrios J. Dimitriou, Maria F. Sartzetaki

**Abstract**—Air Transport links markets and individuals, making regions more competitive and promoting social and economic development. The assessment of social contribution is the key objective of this paper, focusing on the definition of the components of social dimension and welfare metrics in the national scale. According to a top-down approach, the key dimensions that affect the social welfare are presented. Conventional wisdom is to provide estimations on added value to social issues caused by the air transport development and present the methodology framework for measuring the contribution of transport development in social value chain. Greece is the case study of this paper, providing results from the contribution of air transport infrastructures in national welfare. The application key findings are essential for managers and decision makers to support actions and plans towards economic recovery of an economy presenting strong seasonal characteristics (because of tourism) and suffering from recession.

**Keywords**—Air transport, social dimension, social coherence, resilient business development, socioeconomic impact.

## I. INTRODUCTION

AIR transport infrastructure investment are often intend to Ar revive a region's economic competitiveness, particularly that of a region under economic recession. The contribution from transport infrastructure investments, in terms of increased economic efficiency, is higher in developing countries as well as in countries suffering from economic stress. The investments in transport infrastructures in these regions tend to respond higher wages and more multiplied jobs, than regions that are not in recession [1].

Transport systems contribute to economic development through direct, and indirect contributions as well as by multiplying the direct and indirect impact by increasing spending. Especially, the contribution of air transport infrastructure to sustainable development, includes economic profitability, environmental responses to operation impact and regional society.

Airports are vital components of a country's socioeconomic development, due to the creation of wider economic benefits in services and goods, tourism, trade and innovation. Even though the benefits of the air transport are essential, limited research is published regarding the linkage of airport

development or investments in air transport infrastructure and other business sectors (such as tourism), the social dimensions of air transport and interaction of air transport and sustainable development, including social dimension of air transport.

## II. CHALLENGES IN AIR TRANSPORT INFRASTRUCTURES DEVELOPMENT

Air Transport infrastructure projects are developed in a way that competing stakeholder interests and contributions have to be managed. Decision making for new transport infrastructure development is a complicated decision-making process, due to the high amount of capital needed and the stakeholders with different aspects that are involved in decision making process. The decision process is more complicated in airports comparing with other transport infrastructures, where the project survivability is strongly related to regional development prospects and the airport business targets in medium-long time horizon.

The development of air transport infrastructure to meet future demand needs is on the top of the agenda for governments, airport authorities and regional development authorities. This is due to the recognition that airport and air transport development has a vital role in contributing to wider socioeconomic development principles and is a key driver for new income generation, business growth and sustainable development.

The challenge is that the complexities of current financing schemes and the uncertainty in economy mean that decision making for investments in new infrastructure projects such as airports, has to be made within a complicated manner with different strategies and challenges (Fig. 1).

## III. SUSTAINABLE DEVELOPMENT DIMENSIONS OF AIR TRANSPORT

Sustainable development is defined as a multidimensional phenomenon that involves and influences many aspects of people's lives [2], [3]. Air Transport is considered a major economic sector – one important in its own right and which in addition provides vital connecting infrastructure for the lives and livelihoods of a large share of the world's population. Air transport provides the international connectivity the country needs to succeed in a competitive global economy [4] and links markets, making regions more competitive and promoting individuals' social and economic development, affecting three pillars of sustainability: social, economic and environmental.

The three pillars of sustainability-economic, social and environmental-are closely linked.

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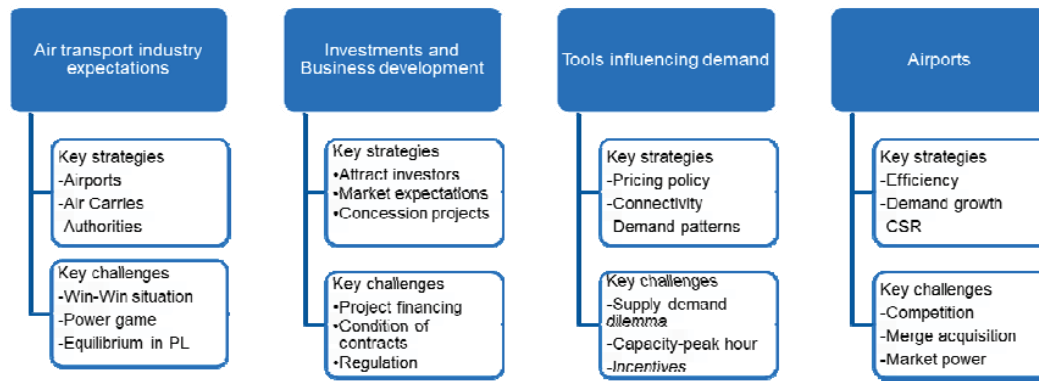


Fig. 1 Air Transport industry different expectations

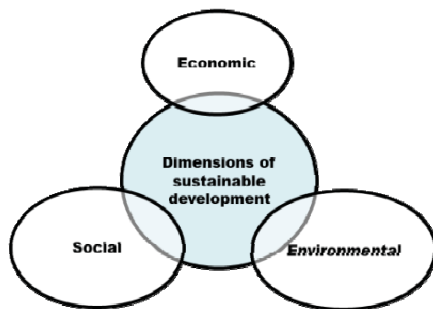


Fig. 2 Dimensions of air transport sustainable development

#### A. Economic Dimension

As regards the economic dimension air transport contributes in national and regional economies not only through direct effects but as well as through recycling of direct effects. There are two levels of economic effects: the first level ensues through the generation of employment, income, and capital investment “naturally” occurring in the process of producing transport services and the second level of effects are the dynamic economic “catalytic” or “spin-off” benefits, in particular the direct/inward investment including tourism development stimulated by aviation. Transportation Research Board report [5], provide a concept to estimate the economic effects of transport services, typically relying on the following approaches: input-output models (multipliers), the assessment of costs and benefits, and the analysis of catalytic effects. Applications of input-output models have traditionally centered on the national level, but modifications to the method of account for the increasing interest of the inclusion of specific local characteristics and regional economic development are popular [6].

#### B. Environmental Dimension

Air industry has a significant impact upon the environment both globally and at regional level [7]. Whilst leisure and tourism have become a major source of income in many regions, at the same time pressure has been exerted on sensitive ecosystems and communities. Air transport has been a major driver in these developments, but often ignored in the debate on how ‘sustainable tourism’ might be conceptualized and implemented. Air, noise and water pollution are three

local environmental impacts that are generally associated with air transport. Thus, an impact like aircraft noise, which is spatially concentrated in certain areas and is clearly traceable to the airport has motivated much greater public protest than the air or water pollution impacts from airports, which diffuse more broadly and mix with pollutants from other sources, [8]. Air transport growth, airports expansion and new airports development may be influenced by climate change implication and impact of climate change or aircraft emissions on local environment. [7], [8]. This in turn could have significant economic implications for regions that are highly dependent upon air transport.

#### C. Social Dimension

Air Transport Social Dimension is a major concern for the majority of states, nations and societies. Complexity and multidimensionality of this social impact addresses the developing of new and more advanced methods of measuring welfare, as this measurement is an essential requirement for the social development of all countries as well as for supporting regional and global cooperation and integration. Focusing on the aviation welfare impact, efficient, safe and secure aviation systems offer important access to markets, employment, education, health and basic services critical to poverty alleviation; at the same time, aviation is a major player in making a big difference in promoting generation of equity and equality.

#### IV. GLOBAL AND NATIONAL SUSTAINABLE DEVELOPMENT GOALS AND TARGETS

Sustainability development is adopted as a multidimensional phenomenon that involves and affects many aspects of socioeconomic development [2], [3]. The need for wider measures of well-being has been supported by key stakeholders in the global development area that focus on a multi-dimensional concept of human well-being

In 1990, the UNDP published its first Human Development Report and has continuously evolved its methodology, developing specific measures of multidimensional poverty alongside its well-known Human Development Index. This move towards an approach to development and societal progress that is focused on human well-being was given

critical momentum by Commission. The Final Report of the Commission in 2009 provided a comprehensive review of the limits of standard economic indicators such as GDP as a measure of a country's economic performance.

OECD has for a long time stressed the need to move "Beyond GDP". In 2011, it launched the Initiative for better life in order to promote the measurement of well-being and set it at the core of decision making. The OECD approach is based on a framework that considers wellbeing in terms of 11 dimensions, 2 distinguishing between well-being outcomes that matter today and those well-being drivers, such as human, natural, economic and social capital, that sustain well-being over time. The OECD framework, as implemented in a series of How's Life Reports [9], [10], has three dimensions: (a) the dimension of well-being, (b) the dimension of development, recognizing that development is not just about living better but about living in better conditions and (c) the dimension that focuses on inequalities across population groups and across the previous two dimensions, rather than just on averages and on low achievements in a limited range of material conditions as for example poverty [10].

More recently, all countries over the world on September 25th 2015, adopted a set of sustainable development goals adopted by UNECE to end poverty, protect the earth from climate change, and promote sustainable development for everyone as part of a new sustainable development agenda be composed of sustainable goals with 169 different targets for following years. For all this achievement both governments, private sector, civil society and all different sectors have a different role on this [11]. Different countries and different stakeholders are focusing their efforts to promote this plan. The 17 Sustainable Development Goals and 169 targets demonstrate the scale of this new agenda for the sustainable development towards 2030. They focus on promoting the Millennium Development Goals and complete the targets that were not met in previous years. They focus especially in human rights and promote gender equality especially for all women. The targets and millennium goals are integrated and focus on the balance of the three dimensions of sustainable development: the economic, social and environment.

#### V. AIR TRANSPORT IMPACT ON WELFARE

Investing in new air transport infrastructures need to meet wider goals, including not only those related to economic growth and environmental implications, but also those related to welfare contribution [12], [13]. Evaluation processes for transport infrastructure improvements need to be adapted to the changing objectives and contributions to welfare, including the estimated impact on:

- Health
- Education
- Purchasing Power based on overall consumption per inhabitant
- Average Income per employee

Evaluation need to be improved to capture the full range of the above components of impact on welfare expected over the

longer periods involved. Once these improvements are made, along the components of the welfare described in Fig. 4 above, better transport strategic infrastructure investments with clear contribution on welfare can be expected.

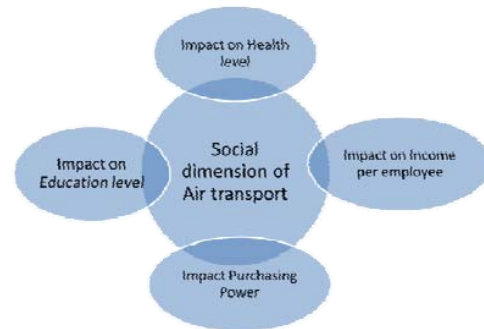


Fig. 3 Dimensions of air transport impact on social development

#### VI. CASE STUDY

The Greek economy is heavily dependent on tourism which accounts for 20% of Greek GDP. Approximately 73% of tourists arrive in Greece by air while 80% of international arrivals are tourists [7]. For the case study as analyzed in Fig. 4 above a strategic transport infrastructure's (main airport in Greece, Athens International Airport) contribution in welfare is very high and boosts the overall levels on welfare of the catchment area and drives the components of national welfare towards the higher average levels of European Union.

#### VII. CONCLUSIONS

The methodology concept and modelling approach provided essential benefits to support decisions on investments prioritization, infrastructure or services privatization and sustainable strategic planning, providing essential tool to scenario assessment, to improve connectivity and enable long term socioeconomic development. Air transport is a crucial issue that planners and decision makers should be concentrated towards economic recovery and decisions impact aviation business, especially, for the aviation related ground infrastructures (ownership scheme, investments etc.) must be reviewed under the view of the impact on local economy and business resilience.

The evaluation of transport infrastructure impact on welfare is needed to get investments in strategic infrastructure back on track, in countries as Greece, that are in recession and whose strategic transport infrastructure is not rated highly enough. The strategic infrastructure needs and investments need to include improvements across all major factors that affect welfare. Once these improvements are made, along the components of the welfare described previously better transport strategic infrastructure investments with clear contribution on welfare can be expected. Finally, the results suggest that investments in air transport infrastructures spur economic growth and strengthen social values towards sustainable development.

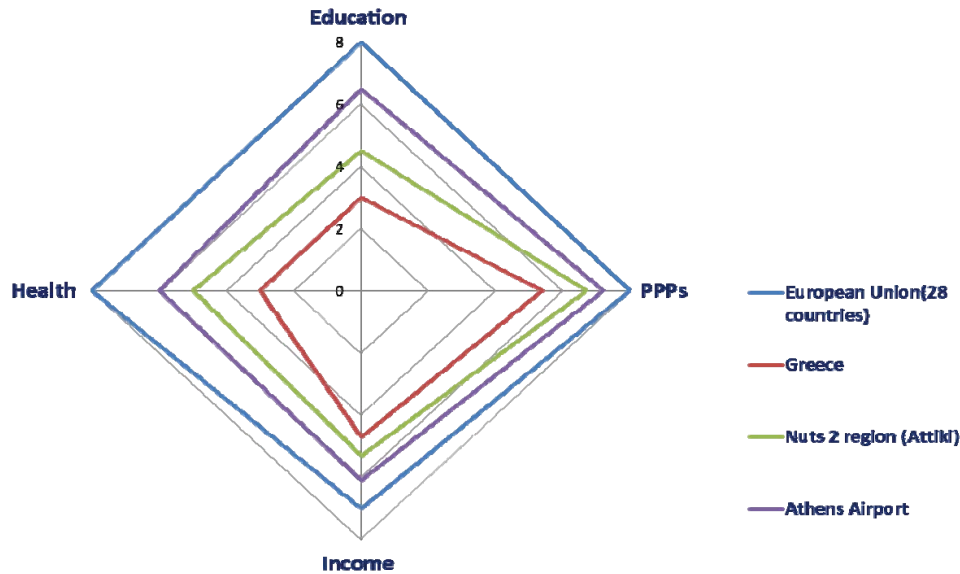


Fig. 4 Welfare impact analysis for large infrastructure in Greece [14]

The estimated results provide a strong evidence of the existence of long run cointegrating relationship among air transport and sustainable development. Therefore in order to achieve the objective of accelerated economic growth and strengthen social values by next years, government authorities and stakeholders need to increase and sustain the level of large infrastructure investments. This is imperative to support decision makers to invest in such infrastructures and ensure sustained reduction in current inequalities in income distribution and welfare components.

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