IDENTIFYING BARRIERS TO THE POTENTIAL IMPLEMENTATION OF ROAD SAFETY GOOD PRACTICES IN AFRICA

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Word count: 248 words abstract + 4,959 words text + 3 tables x 250 words (each) = 5,957 words

Submitted: July 29, 2019

ABSTRACT

Africa is the worst performing Continent in road safety and year after year the situation worsens. To reverse this trend, it is essential to bear in mind that road safety problems in Africa should be preferably considered in their own context, as well as the proposed solutions to address them. Towards this direction, the objective of this paper is to present the development of the *SaferAfrica Transferability Audit* within the EU funded *SaferAfrica* project, and its pilot application to identify the barriers to the potential implementation of good road safety practices in five selected African Countries (Tunisia, Kenya, Cameroon, Burkina Faso, and South Africa). The proposed tool allows assessing whether the implementation of a given road safety intervention may face problems within one (or more) of the three domains of the Road Safety Space: Society/Culture, Economy, and Institutions. A total of 14 responses were obtained from stakeholders of the five countries. The stakeholders surveyed have different backgrounds: public employees, academics and non-governmental organizations participants. Cameroon had the largest participation, with a total of eight responses; two responses were received from Burkina Faso and Tunisia, each; and only one response was received from Kenya and South Africa. With a total of five responses, the Safer Road Users pillar of the African Road Safety Action Plan was the one with the highest participation. Economy issues are the most challenging for transferability of road safety interventions in Kenya, South Africa and Tunisia, while in Burkina Faso and Cameroon it is Society/Culture.

Keywords: road safety, decade of action for road safety, SaferAfrica, transferability, good practices

INTRODUCTION

According to the Global Status Report on Road Safety 2018, around 1.35 million people die and 50 million are injured in road crashes every year *(1)*. Road traffic crashes are estimated to be the ninth leading cause of death, and projections reveal that it will be the third leading cause of death by 2020 *(2)*. The cost associated with deaths and injuries is estimated to be in the range between 1.3 and 3.2% of the GDP per annum for many countries *(3)*. To this regard, according to Hasmukhrai et al. *(4)*, traffic accident prevention has been a consensus all the time around the World and in the last several years a large amount of money has been spent to reduce the number of fatalities. Traffic crash prevention also leads to a reduction of social and economic costs associated with accidents and collisions in road transportation

Relative to their level of motorization, Low- and Middle-Income Countries (LMICs) bear a disproportionately high burden of road deaths, when compared to more motorized High-Income Countries. Approximately 90% of the related deaths resulting from road traffic crashes (RTCs) occur in LMICs, while these countries account for 82% of the world's population and their level of motorization stands at only 54% of the world's number of registered vehicles *(1)*. In the same way, the accident risk (number of accidents per traffic exposure, such as vehicle-km) is generally higher in developing countries, with far more severe consequences, as well *(5, 6)*.

Africa is the worst performing Continent in road safety. In 2013, the mortality rate in this Continent (26.6 fatalities/10^5 population) was almost three times that of Europe, where the number of road fatalities represented the 31% of the relevant global picture *(7)*. However, the most disturbing concern is the fact that the disparity in road safety results seems to be increasing. Road trauma in Africa is expected to worsen further, with fatalities per capita projected to double over the period 2015-2030 *(8)*.

In any case, progress was made by some countries, in mitigating the number and severity of road accidents *(9)*, but in most LMICs the situation is alarming and worsening *(10)*. Overall transport policies in LMICs are often poorly designed and implemented, as regards road safety aspects. Infrastructure investments are lagging and Cost-Benefit Analysis in planning processes are rarely used *(11)*. In Africa, several actions are already ongoing and important high level documents are already in place, paving the way for road safety improvements, such as the African Road Safety Action Plan 2011-2020 *(12)*, a result from the common effort of the African Union (AU) and the United Nations Economic Commission for Africa (UNECA).

In order to improve road safety performance in African countries, many barriers must be overcome *(13)*. In this background, the *SaferAfrica* project, a joint effort of 17 partners from Africa and Europe, aims at establishing a Dialogue Platform between Africa and Europe focused on road safety and traffic management issues. The Dialogue Platform comprises a high-level international institution in charge of providing recommendations to update the African Road Safety Action Plan and the African Road Safety Charter, as well as fostering the adoption of specific initiatives, properly funded.

The purpose of this paper is to outline the results of the process used in the *SaferAfrica* project for identifying potential barriers to the implementation of road safety intervention good practices in Africa, using the mentioned five countries as pilot examples. This process included the development and application of the *SaferAfrica Transferability Audit* (STA), within a "participative" process involving all possible national interested parties.

THE MEANING OF TRANSFERABILITY

Transferability means the quality of being exchangeable *(14)*. It refers to the extent to which the outcomes of an applied intervention evaluated in a primary context, the *origin context*, may be achieved in a different context, called *receptor* or *target context*.

The basic assumption behind this idea is that "what proved to be effective in a place may be also useful in another place" *(15)*, but the translation of this concept into practice is more challenging and, in some cases, even complex.

The concept is different from the *Generalizability* of results, which relates to the extent to which the findings of an intervention can be generalized to a wider population *(16)*. Generalizability is a requisite for transferability: if an intervention has been appropriately evaluated and its results can be generalized then transferability could be assessed. Generalizability of good practices can be appraised through the quality of the evidence in the primary context.

Another requisite for transferability is *applicability*, or feasibility, which measures the extent to which a road safety *intervention process* can be implemented in a given context *(16)*. Indeed, *Transferability* is often confused with the selection of measures that could fit a given situation, that represent a sort of recommendation of best practices; actually, it is a process in which the feasibility of applying a set of measures from an original context in a receptor context is assessed. This means that an evaluation must be made of the efforts and resources required for the measures to succeed, including an analysis of the barriers to overcome. In fact, usually, transferability appraisals integrate applicability or include criteria related to intervention applicability *(17, 18)*.

Consequently, performing a transferability exercise requires not only some discipline in following a suitable methodology but, ultimately, also a wise judgement on its overall fitness *(14)*. This statement highlights another key issue, i.e. the proper knowledge of both origin and receptor contexts and the consequent identification of barriers that may hinder the successful implementation of a measure.

Road safety measures developed in high-income countries might not fit well with the safety needs of low-income and middle-income countries *(2)*, like African Countries, for a variety of reasons, including, among others, the low per capita incomes, the presence of mixed traffic, a low capacity for capital intensive infrastructure, and a different situation as regards law enforcement. Thus, in such Countries, road safety interventions should be promoted within existing conditions. Indeed, in high-income settings, new strategies and programs for traffic injury prevention generally require considerable analysis and planning before implementation; in developing countries, though, because of the scarcity of resources, the priority should be the prospective assessment and adaptation of proven and promising methods from other nations (both developed and low income), and a pooling of information on their effectiveness in the imported settings among other low-income countries.

Examples of transferability of road safety policies and measures are rare, and in several cases, they deal with simple recommendations of best practice to transfer *(15)*. The literature on transferability of transportation policies is richer, and consolidated results from transferability studies are available, although they mostly concern transfer of policies between developed countries. Among the transferability studies, some relevant European Commission (EC)-funded research projects are:

- LEDA - Legal and regulatory measures for sustainable transport in cities *(19)*.
- CUPID – Co-ordinating urban pricing integrated demonstration *(20)*.
- TRANSPLUS - Transport Planning, Land Use and Sustainability *(21)*.
- CIVITAS Initiative – Clear and better transport in cities *(22)*.
- SAFERBRAIN - Innovative Guidelines and Tools for Vulnerable Road Users Safety in India and Brazil *(23)*.

These examples take into consideration the legal and regulatory aspects, the available economic resources and the social issues as factors influencing the transferability process as a whole. On the other hand, although most of the aforementioned methodologies are from the transport sector, the SaferBrain's methodology is focused on transferability with a focus on road safety projects. This latter methodology takes into account the concept of road safety space, proposed by King *(18)*.

The Road Safety Space

Factors considered into *Transferability* can be referred to the concept of Road Safety Space, proposed by King *(18)*. According to this concept, in a given country each road safety issue exists in a space defined by economic, institutional, and social and cultural factors (also referred to as domains) which influence it (Figure 2).

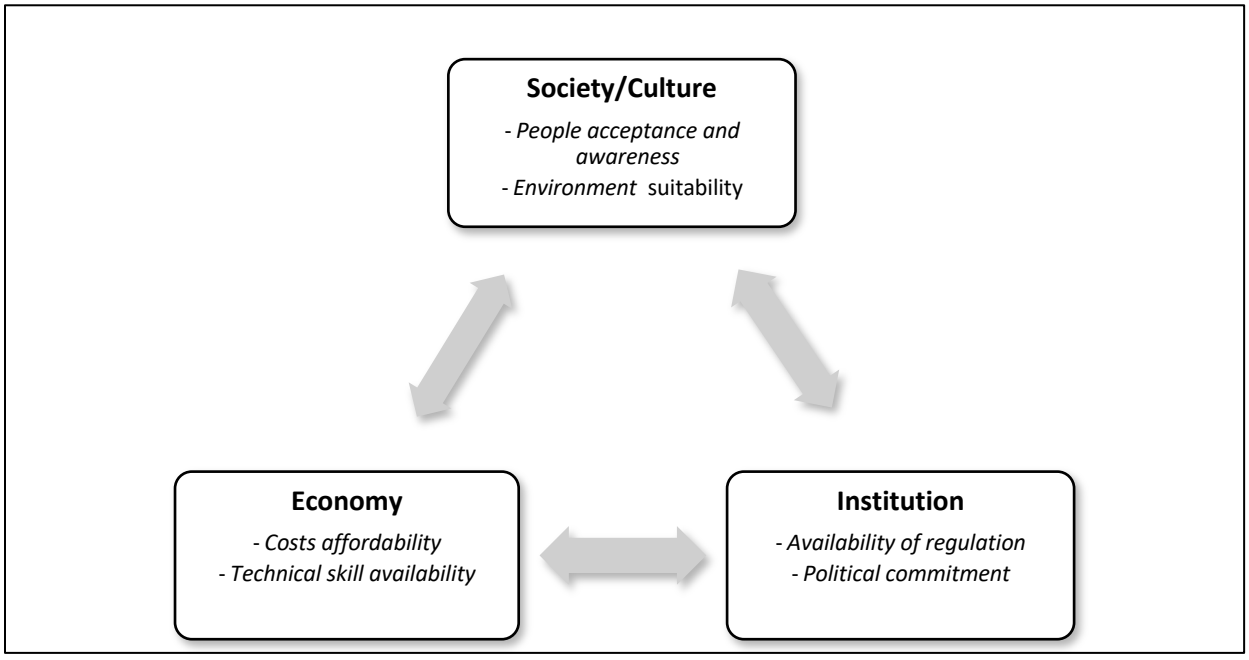

Figure 2. Model of the road safety space.

Each domain can affect the others, can have both a local (case study, pilot study, urban area) and a general (state, nation) influence, and may involve more study areas than the usually involved ones (i.e. safety and mobility): psychology, anthropology, public health, security, etc. The deeper the three main domains are analyzed, the easier it is to identify promoters and barriers to support the transfer feasibility.

At the same time, it may be hard to deal with the three domains according to a univocal and quantitative point of view. The problem can be addressed through the elaboration of a kind of "environment" where, theoretically, a Transferability Study can take place and where all the mutual influences among the above-mentioned domains occur.

The logical process for the Transferability Study is based on the following steps *(15)*:

- Use the "road safety space" concept to identify the factors belonging to the domains which can affect the safety issue in hand.
- Select which are the effective interventions likely to be transferred among those available from the origin context.

- Use the "road safety space" concept to identify the factors which made the prospective interventions successful in the origin context.
- Assess whether, according to the target context, the interventions to be transferred are likely to be successful as they were in the origin case study or if they need to be adjusted to the new local situation; the conclusion that they may be of no use (with or without amendments) may be contemplated.

The Road Safety Space concept may be applied to analyze the transferability of single measures or of packages of measures. In both cases, an important point is the analysis of factors which made the transferable measures successful in the origin context.

METHODOLOGY

This section gives an overview of the methodology proposed and the application of a *SaferAfrica Transferability Audit* (STA) within the EU funded *SaferAfrica* project in order to identify the barriers to the potential implementation of good road safety practices identified in selected African Countries (Tunisia, Kenya, Cameroon, Burkina Faso, and South Africa). These countries were selected as representing different UN geographic areas of Africa.

The methodology is based on the one used in the *SaferBraIn* project, where the transfer processes of interventions for improving vulnerable road user safety were assessed for India and Brazil [15]. In this study, the *SaferAfrica Transferability Audit* (STA) was developed as a process adapted and calibrated to the wider context of Africa.

The process started with selecting promising road safety good practices to transfer, selected from a collection of good practices from Europe, Africa and elsewhere *(24)*. Next, a Problems Priority Matrix (PPM) was created. Finally, the total scores and a list of problems arisen from the Problems Priority Matrix (PPM) were assessed.

Selected good practices for SaferAfrica Transferability Audit (STA)

Good practices in road safety interventions were defined as those that meet the following criteria:

- including a focus on clearly identified road safety problems and knowledge of the active mechanism put in place to mitigate them;
- the relative size of the safety phenomenon addressed;
- a quantitative assessment of the likely impact of the intervention;
- a reported evaluation of effects;
- results from costs and benefits analysis;
- acceptance by public and policy makers;
- the prospect of long-term effects.

Evidence relating to good practice was gathered from several sources, following a literature search and including related project reports, journal articles, websites, reports from financing projects for transport sector reformation (NGOs and development banks), and expert knowledge among a range of European and African project partners.

In the framework of the *SaferAfrica* project a total of 40 road safety intervention good practice examples were collected and highlighted, from Europe, Africa and the rest of the World *(24)*. From those 40 interventions, 25 well-documented examples were selected. The interventions were grouped according to the priority areas set up by the African Road Safety Action Plan, corresponding to the five pillars: Road Safety Management, Safer Roads and Mobility, Safer Vehicles, Safer Road Users, and Post-Crash Response (Table 1).

Table 1. Subset of road safety interventions selected for *SaferAfrica Transferability Audit*.

Pillar	Sub-pillar	Road safety intervention	Area of example
Road safety management	Establish and strengthen Lead Agency	Department for Transport as Great Britain's Lead Agency	Great Britain
		Federal Road Safety Corps	Nigeria
	Improved management of data	Traffic accident databases and information system on road safety	Cameroon
	Develop and strengthen partnership and collaboration	Insurance Institute for Highway Safety	USA
Safer roads and mobility	Safer road infrastructure for all road users	The hierarchical mono-functional road network	The Netherlands
		Infrastructure safety management on Motorways	Austria
		Road Safety Audits guidelines	UK
		kiwiRAP	New Zealand
	Capacity building and training of road safety	Education and training of auditors and instructors	Austria
		Delft Road Safety Course	The Netherlands
		Road Safety Master Courses for engineering and economics faculties	European Union; Belarus
Safer vehicles		Introduction of EuroNCAP star rating in 1997	UK
		Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonization of Vehicle Regulations	World wide
		Periodic vehicle inspection	Turkey
		ABS and helmets in two-wheeled vehicles	European Union
		Heavy vehicle overweight control in the Douala-N'Djamena corridor	Cameroun
Safer road users	Use of helmets	Introduction of mandatory helmet use and law enforcement	Vietnam
	Use of seatbelts	Enforcement of the law related to mandatory seatbelt use within the front seats in urban areas	Tunisia
	Drink/drug-driving	Reducing BAC limits and increasing penalties on drink-driving	Mexico
	Mobile phone use whilst driving	The 'Speak Out' Publicity Campaign	Norway
	Speeding	National speed awareness course for offenders	UK
	Education and Licensing	Graduated driver licensing system: the effect on motorcycle traffic crash hospitalizations	New Zealand
Post-crash response		First Aid courses in driver education	Austria, Bosnia, Estonia, Germany, Hungary, Latvia, Lithuania, Slovakia, Switzerland
		Emergency First Aid Responder System (EFAR)	South Africa
		Establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims	Kenya

The Problem Priority Matrix (PPM)

The Problem Priority Matrix (PPM) is commonly used in project management to prioritize activities. It can help an organization to make decisions, by narrowing options down by systematically comparing choices through a number of (weighted) criteria important for the organization.

The "influence matrix" is an effective tool to analyze links among the list of road safety interventions and the three Road Safety Space assessment domains, as arising problems which could hinder the implementation of a given safety improvement. In this influence matrix the relationships between row and column items are scored and weighted, so as to have a proper knowledge of the most and least challenging measures. This influence matrix is translated into the Problems Priority Matrix (PPM), where rows represent the safety interventions and columns the three Road Safety Space domains (i.e. Society, Economy, and Institution).

The basic task is to assess whether a given road safety intervention may be perceived as a problem within one (or more) of the assessment area(s) provided by the Road Safety Space (i.e. Society/Culture, Economy and Institution) as research layers which describe the receptor context. To this aim, 6 factors (2 for each domain) were adopted related to the 3 main road safety space domains. For the Society/Culture domain: people, and environment; in the Institution domain: availability of regulation, and political commitment); and for the Economy domain: design, implementation and maintenance costs affordability, and technical skill availability.

A number of possible questions related to each factor has been derived from existing literature to assess the transferability of an intervention *(15, 16)* and reported in Table 2.

Table 2. Questions addressing transferability.

Component	Factors/Criteria	Questions to assess Criterion
Society/Culture	People	Would the general public and the targeted population accept this intervention? Does any aspect of the intervention conflict with local social norms? Is it ethically acceptable? Can the contents of the intervention be tailored to suit the local culture? Does the target population in the local setting have a sufficient educational level to comprehend the contents of the intervention? Is the target population aware of the road safety problem addressed?
	Environment	Is it possible to change the built environment in order to accommodate the proposed practice?
Institution	Availability of regulation	Legislation relevant to the transferability of the intervention available (standards of service quality and safety, …)
	Political commitment	Does the political environment of the local society allow this intervention to be implemented? Is there any political barrier to implementing this intervention?
Economy	Design, implementation and maintenance costs affordability	Are the essential resources for implementing this intervention available in the local setting? (list of essential resources would help answer this question).
	Technical skill availability	Does the provider of the intervention in the local setting have the required skills to deliver this intervention?

The PPM consists of rows listing road safety practices and columns representing the factors of the road safety space. Scores to be assigned to a practice depend on the difficulty to transfer/adapt it to the receptor country. The more challenging is the transfer/adaptation, the higher is the score, according to the following Likert scale:

- High challenging: score = 5
- High-medium challenging: score = 4
- Medium challenging: score = 3
- Medium-low challenging: score = 2

- Low challenging: score = 1

It was assumed that interventions with similarly challenging scores might differ in terms of level of importance attributed by policy makers and stakeholders to each specific measure criterion. Environment suitability might be critical for the successful implementation of e.g. a roundabout, but not for an educational measure.

Weights (%) were assigned according to the relative importance of criteria with regards to the successful implementation of the intervention (e.g. are criteria related to population more important than e.g. technical skill availability for road safety campaign measures?) so that the total sum of weights is 100% (e.g. People 30%, Environment 10%, Availability of regulation 5%, Political commitment 5%, Design, implementation and maintenance costs affordability 20%, Technical skill availability 30%). The final scores were calculated per rows and columns as follow: For row *i* (1 to n):

$$\sum_{i=1}^{n} s_i \cdot w_i \quad (1)$$

For column *j* (1 to m):

$$\sum_{j=1}^{m} s_j \quad (2)$$

For column *k* (1 to m):

$$\sum_{k=1}^{m} w_k \quad (3)$$

Where $s_i =$ assigned score for row; $w_i =$ assigned weight (%) for row; $s_j =$ assigned score for column, and $w_k =$ assigned weight (5) for column.

As a result, the lowest are the total scores per rows the least challenging are the interventions to be implemented. Also, when the total scores per columns are the lowest, then the least affected are the related *Road Safety Space* components (Society/Culture – Institution – Economy) for the group of assessed measures. On the contrary, higher scores reveal measures which, even though theoretically transferable, are very likely to be unsuitable to the context under analysis.

Practical realization of SaferAfrica Transferability Audit (STA)

Relationships between rows and columns were scored and weighted by *SaferAfrica* stakeholders, to identify which measures would be best placed to address road safety issues at country level in their countries. In order to ease the audit process and make it simple, the STA was launched through an on-line survey on the African Road Safety Observatory, available both in English and French. The African Road Safety Observatory (http://www.africanroadsafetyobservatory.org/) is one of the principal outputs of the *SaferAfrica* project. The Observatory is an interactive platform, designed to help European countries and African people to cooperate, exchanging experiences and knowledge with the main vision of making African roads safer.

After filling the first page with personal data and indicating the Country of origin, respondents were asked to read a brief description of the transferability methodology using the Road Safety Space concept. Then, they were asked to select a Road Safety Pillar depending on their expertise. As mentioned before, good practices were divided according the Pillars of the ARSAP. Beyond the 5 pillars a Capacity building group of good practices were considered.

After the Pillar selection, the respondent started filling in the survey. For each good practice intervention, a short description was provided. In addition, for more detailed information, a full description of the intervention was also available. Then, respondents were asked to assign scores and weights, answering to two separate questions. After assigning scores and weights, the respondents could continue with the following interventions, until the end of the session. They

also had the opportunity to add justifications of the assigned values and provide additional comments.

RESULTS

A total of 14 responses were obtained from the five countries for all the pillars. The stakeholders surveyed come from a wide variety of backgrounds such as: public employees, academics and NGO participants. Each of the respondents assessed only one pillar according to their experience and work area. The largest participation was from Cameroon with a total of eight responses, from Burkina Faso and Tunisia two responses each were received, and for Kenya and South Africa only one response. The Safer Road Users pillar with a total of five responses was the one with the highest participation. Then, Safer Roads with 4 responses, Road Safety Management and Data Collection with 2 responses, Capacity Building, Post-crash Response and Safer Vehicles with only one response. Table 3 summarizes the final scores assigned to each intervention in the five Countries by Pillar.

Table 3. Final scores per intervention

Pillar	Road safety interventions	Scores					
		Burkina Faso	Cameroon	Kenya	South Africa	Tunisia	Average
Road safety management	Department for Transport as Great Britain's Lead Agency	-	2.2	-	-	-	2.2
	Federal Road Safety Corps	-	2.3	-	-	-	2.3
	Traffic accident databases and information system on road safety	-	2.2	-	-	-	2.2
	Insurance Institute for Highway Safety	-	2.5	-	-	-	2.5
Safer roads and mobility	The hierarchical mono-functional road network	-	2.9	3.0	-	3.2	3.0
	Infrastructure safety management on Motorways	-	3.1	3.8	-	3.5	3.5
	Road Safety Audits guidelines	-	3.2	3.5	-	4.0	3.6
	kiwiRAP - Road Assessment Program	-	3.0	3.8	-	4.2	3.7
Capacity Building	Education and training of auditors and instructors	-	2.8	-	-	-	2.8
	Delft Road Safety Course	-	2.4	-	-	-	2.4
	Road Safety Master Courses for engineering and economics faculties	-	2.6	-	-	-	2.6
Safer vehicles	Introduction of EuroNCAP star rating in 1997	-	-	-	-	2.9	2.9
	Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonization of Vehicle Regulations	-	-	-	-	1.3	1.3
	Periodic vehicle inspection	-	-	-	-	1.3	1.3
	ABS and helmets in two-wheeled vehicles	-	-	-	-	3.6	3.6
	Heavy vehicle overweight control in the Douala-N'Djamena corridor	-	-	-	-	3.5	3.5
Safer road users	Introduction of mandatory helmet use and law enforcement	3.2	3.9	-	1.3	-	2.8
	Enforcement of the law related to mandatory seatbelt use within the front seats in urban areas	2.2	4.0	-	3.5	-	3.2
	National speed awareness course for offenders	2.5	4.2	-	4.6	-	3.8
	Reducing BAC limits and increasing penalties on drink-driving	3.9	3.4	-	2.8	-	3.4
	Graduated driver licensing system: the effect on motorcycle traffic crash hospitalizations	3.0	3.8	-	5.0	-	3.9
	The 'Speak Out' Publicity Campaign	2.2	3.7	-	3.7	-	3.2
Post-crash response	First Aid courses in driver education	-	2.9	-	-	-	2.9
	Emergency First Aid Responder System (EFAR)	-	2.8	-	-	-	2.8

Establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims	-	2.8	-	-	-	2.8

In Burkina Faso only, the *Safer Road Users* pillar has been assessed. The less challenging interventions are "enforcement of the law related to mandatory seatbelt use within the front seats in urban areas", "The 'Speak Out' Publicity Campaign (Norway)" and "Impact Evaluation of the National Speed Awareness Course". The factor *Regulation* is the least challenging with a score of 1.2. The weight of the factors depends 57% on *People* and *Design, implementation and maintenance costs affordability* with 34% and 23% respectively.

Cameroon has reported the highest number of answers. All the pillars have been assessed except for *Safer Vehicles*. Regarding *Road Safety Management and Data Collection*, all the interventions show low scores, and, thus are less challenging. The factors *Regulation* and *Environment* are the least challenging with a score of 1.6. For the *Safer Roads* pillar, also in this case scores among interventions are similar and show to be potentially easily transferable. The factor *Environment* is the least challenging with a score of 2.5. The weight of the factors depends 39% on *Regulation* and *People* with 20% and 19% respectively. In *Safer Road Users* and *Capacity Building* pillars scores among interventions are relatively high and, thus, showing a lower potential for transfer. In the *Post-crash Response* pillar, the final scores were very similar and relatively low for the three interventions, showing a high potential for easy transferability. The factor *People* is the least challenging with a score of 2.0. The weight of the factors depends 30% on *People* and 45% on *Environment*, *Regulation*, and *Political commitment.*

In Kenya, only the *Safer Roads* pillar was assessed. "The hierarchical mono-functional road network – The Netherlands" was the intervention with the lowest score and, thus, less challenging. Regarding the factors, *People* and *Environment* are the least challenging with a score of 1.8. The weight of the factors depends 51% on *Technical skill availability* and *Design, implementation and maintenance costs affordability* with 28% and 23% respectively.

In South Africa only, the *Safer Roads Users* pillar was assessed. "The effect of introducing Vietnam's first mandatory law on helmet use and head injury and fatality rates" was the intervention with the lowest score and, thus, more easily transferable. The factor *Regulation* is the least challenging with a score of 2.7. The weight of the factors depends 53% on *People* and *Design, implementation and maintenance costs affordability* with 28% and 25% respectively.

In Tunisia the pillars *Safer Roads* and *Safer Vehicles* were assessed. In *Safer Roads* the final scores were very similar and relatively high for all four interventions, showing a low potential for transferability. The factors *People* and *Environment* are the least challenging with a score of 2.0. The weight of the factors depends 50% on *Technical skill availability* and *Design, implementation and maintenance costs affordability* with 25% and 25% respectively. Regarding *Safer Vehicles*, "Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonization of Vehicle Regulation" and "Periodic vehicle inspection Turkey" were the interventions with the lowest scores and, thus, less challenging implementation. The factor *Technical skill availability* is the least challenging with a score of 1.2. The weight of the factors depends 44% on *People* and *Political commitment* with 23% and 21% respectively.

Figure 2 shows each factors' weight by country. In countries with more than one pillar (Cameroon and Tunisia), an average value is shown. The factor *People* has the greatest influence on Burkina Faso, Cameroon and South Africa with 34% 25% and 28% respectively. While for Kenya (28%) and Tunisia (21%) the most influential factor is *Technical skill availability.* For all countries the least influential factor is *Environment*, with an average of 10%.

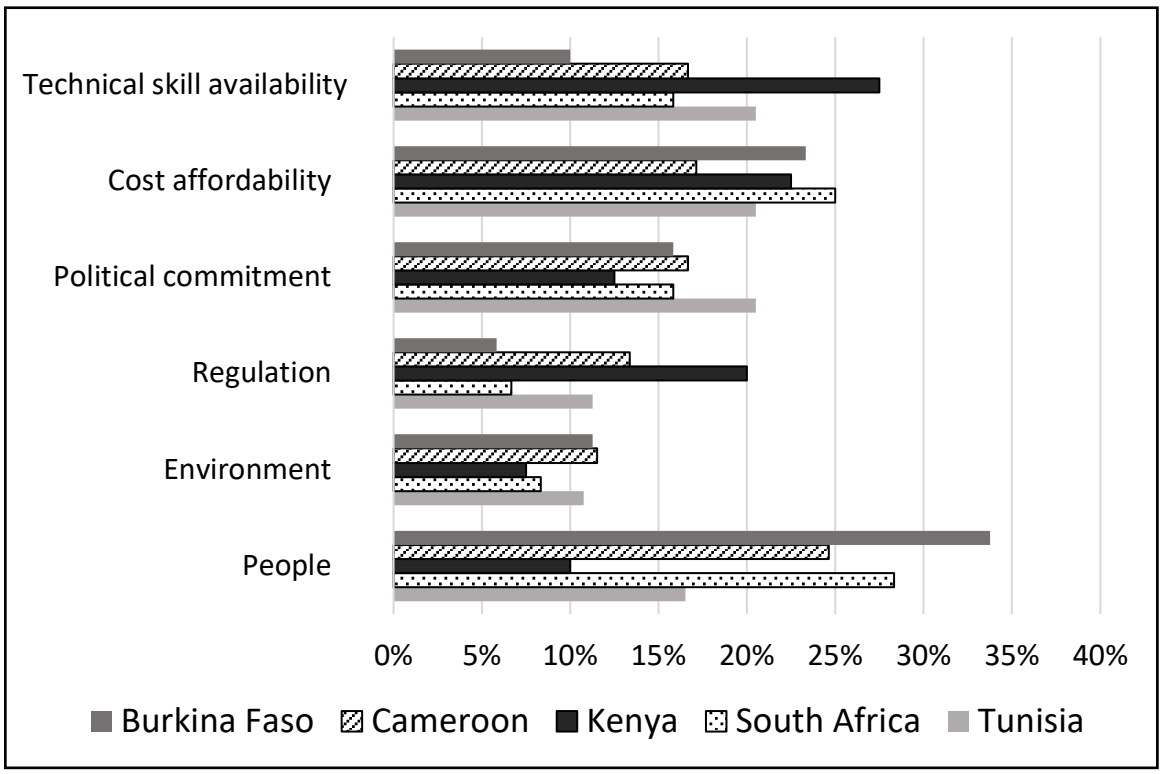

Figure 2. Factors' weight by country.

Figure 3 shows the weight of each dimension by country. *Economy* is the most challenging dimension for the transferability of road safety good practices in Kenya, South Africa and Tunisia, while this is the case for *Society/Culture* in Burkina Faso and Cameroon. On the other hand,, *Institution* is the least challenging dimension for all countries.

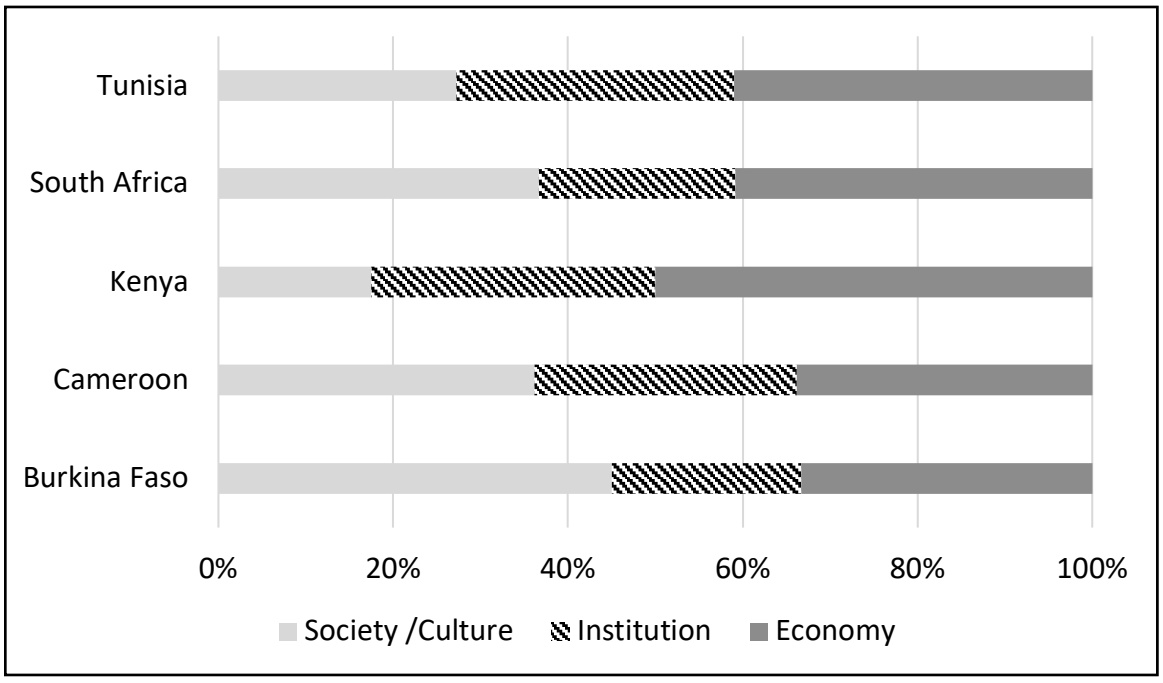

Figure 3. Road Space Dimensions' weight by country.

DISCUSSION AND CONCLUSIONS

This paper has presented the results of the process used in the *SaferAfrica* project for identifying the barriers to the potential implementation of good road safety practices in five African countries: Tunisia, Kenya, Cameroon, Burkina Faso, and South Africa. Its applicability in a context like the Africa region, makes the procedure very attractive for Low- and Middle-income countries (LMICs).

Based on the methodology proposed in the *SaferBraIn* project, the *SaferAfrica Transferability Audit* (STA) has been developed, where the process has been adapted and calibrated to the wider context of Africa. The tool to analyze transferability is a Problem Priority Matrix (PPM) where rows represent road safety measures for each pillar of the African Road Safety Action Plan (ARSAP) and columns the three Road Safety Space dimensions (Society/Culture, Economy and Institution). Relationships among rows and columns were scored and weighted by *SaferAfrica* stakeholders, so as to identify which measures would be best placed to address safety issues at country level. A total of 14 responses were obtained from the five countries for all the pillars. The largest participation was from Cameroon with a total of eight responses, from Burkina Faso and Tunisia two responses were received for each and for Kenya and South Africa only one response.

The factor *People* has the greatest influence on Burkina Faso, Cameroon and South Africa with 34% 25% and 28% respectively. While for Kenya (28%) and Tunisia (21%) the most influential factor is *Technical skill availability.* For all countries the least influential factor is *Environment*, with an average of 10%. *Economy* is the dimension of greatest challenge for the transferability of good practices in Kenya, South Africa and Tunisia; while for Burkina Faso and Cameroon it is *Society/Culture*. On the other hand, *Institution* is the dimension least challenging for all countries.

However, it is worth to notice that this study shows some limitations. The PPM is a subjective tool and ratings depend on the individual concept and experience of the expert who performs the analysis; this means that ratings may vary for the same project and for the same Country from one stakeholder to another.

Another limitation was the low participation of Stakeholders; unfortunately, this has been one of the main obstacles identified within the *SaferAfrica* project. In addition, respondents had the opportunity to write a final comment, but no feedbacks were received. Future research could apply the *SaferAfrica Transferability Audit* (STA) in more countries and involving more participants in order to make a wider comparison between African Countries. It would be also interesting and useful to examine the implementation of good practices in the selected countries to validate and identify the strengths and weaknesses of the methodology.

Consistency calls for a logical coherence among the three domains that constitute the "road safety space" (i.e. economic resources, institutions and social/cultural patterns) between the origin and the target contexts; it is necessary not only to transfer individual measures but also the concepts behind them, specifically the political visions supporting them, which means the export not only of technical know-how but also of consensus building, along with procedures for the long-term assessment of the transferred policies/measures. This is another issue that remains pending and would contribute to improving the methodology.

Finally, the implementation phase is still pending and this requires actions from all fronts: political leaders, leaders of companies and public agencies, policy makers and academics in a position to influence change in a local, regional or national government, corporate or social setting, also with the financial support of multilateral organizations and development banks. In any case, this first step allows a great advance in the objective of reducing road traffic crashes and improving

road safety in developing countries and especially in the Africa region, identifying which good practices could be carried out in the short and medium term in the selected countries.

ACKNOWLEDGMENTS

The study presented in this paper is part of the research project titled "*SaferAfrica* - Innovating dialogue and problems appraisal for safer Africa", funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 724029.

AUTHOR CONTRIBUTIONS

The authors confirm contributions to the paper as follows:

- Study conception and design: González-Hernández, B., E. Meta, L. Persia, D. S. Usami, and J.L. Cardoso.
- Data collection: González-Hernández, B., E. Meta, L. Persia, D. S. Usami, and J.L. Cardoso.
- Analysis and interpretation of results: González-Hernández, B., E. Meta, and D. S. Usami
- Draft manuscript preparation: González-Hernández, B. and E. Meta.

All authors reviewed the results and approved the final version of the manuscript.

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