CYCLING IN UPPER EGYPT AND THE REQUIRED ACTIONS TO ENCOURAGE IT ‘MINIA CITY CASE’

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ABSTRACT

With increasing congestion, air pollution, fuel price and the other side effects of motorization in Egypt, an attempt to know the possibility to reach to a higher level of cycling in Upper Egypt, and the required actions to encourage cycling in Upper Egypt has been performed. Minia city-Minia governorate was selected as a case study in this research. The reasons of low levels of bicycling in Upper Egypt has been investigated, for collecting data, a questionnaire through direct interviews with students (n=925) male and female has been performed. The study results show that there are barriers for bicycles use in Upper Egypt such as (infrastructures, safety, social norms and culture, and safe parking). 58% of males and 22 % of females that participated in the interviews will be potential users for cycling, if the cycling culture is introduced and there is available safe route and safe parking places for bicycle. They may use bicycles as a mode of transport for short distances mainly because of health, economic, and environmental considerations. According to the study results the requirements to encourage cycling could be obtained, the main requirements is that, the government should has policy for cycling, and some cultures and traditions has to change by promoting cycling through media.

Keywords: Commuter cycling; Cycling; Public transport; Sustainable transport; Policies; Bike infrastructure.

1. INTRODUCTION AND BACKGROUND

Non-motorized transport modes are often considered as vital elements of sustainable transport systems. Their emissions of pollutants and noise, and the accident risks they pose for other road users are very low. Thus, a high share of non-motorized transport modes would certainly contribute to a more attractive urban environment. Moreover, it is increasingly recognized that the use of non-motorized transport modes is an effective way for many people to cope with health
problems and obesity. In transport research, considerable attention has been devoted to the question of how to get people out of their cars (Hensher, 1998; Stradling, 2003). It is, however, difficult to turn this aspiration into practice. A reduction in short trips by car is important for the future of cities (Monzon et al., 2011) and could also bring benefits for health, the environment and quality of life (Grabow et al., 2012; Mackett, 2003; Maibach et al., 2009). Attention is paid to the bicycle because it can provide a genuine sustainable alternative to the car for many trip purposes.

In large US cities bicycling accounts for 0.8% of commutes to work, compared to 10–37% in large bike-friendly cities in the Netherlands, Denmark, and Germany (Pucher and Buehler, 2012). In some parts of Europe, cycling accounts for a much higher modal share, up to 26% of all trips in the Netherlands and 16% in Denmark (Ministry of Transport Public Works and Water Management, 2009). The car has certain advantages over other modes in terms of speed, flexibility, safety and personal space. But car travel can have negative aspects for the user, such as being a very stressful experience (Novaco et al., 1990; Rasmussen et al., 2000), whilst cycling can be pleasant and exciting (Gatersleben and Uzzell, 2007). Studies have shown that cycling can reduce the risk of cardiovascular disease and premature mortality (Andersen et al., 2000; Bauman and Rissel, 2009) and that the health benefits of a shift towards walking and cycling (sometimes known as active travel) are likely to strongly outweigh the harms (de Hartog et al., 2010). For car users to change their travel behavior, however, a desire for change, clear benefits and the availability of a viable alternative are likely to be required (Stradling et al., 2000).

Active travel is an approach to travel and transport that focuses on physical activity (walking and cycling) as opposed to motorized and carbon-dependent means. More walking and cycling, for all trip purposes – to work, education, shopping, social and leisure trips – can generate important economic benefits through large public health gains in addition to reduced pollution and congestion. Physical activity deficiency is one of the leading risk factors for ill-health in the 53 Member States in the World Health Organization European Region, where nearly one million deaths per year are estimated to be attributable to physical inactivity (WHO, 2009).

For society and for the individual, cycling presents a number of interesting advantages over other modes of transport. Individuals benefit from the fact that cycling is a healthy and cheap form of transport. Moreover, in urban areas, cycling can sometimes prove to be faster than other transport modes and also allows cyclists to avoid traffic jams (Olde Kalter, 2007). For society, meanwhile, the advantages of cycling include environmental sustainability, cheap infrastructure requirements and improvements in public health (Olde Kalter, 2007). Cycling also has a number of disadvantages, however, including a greater physical effort, the difficulty of carrying loads while cycling, being at the mercy of the weather, and, outside urban areas, travelling more slowly than motorized transport. Factors such as physical effort and speed also limit the distance that a cyclist can travel.

Utility cycling is defined as ‘a short to medium cycling trip often made in an urban environment for commuting to work, going shopping and running errands, as well as heading out for social activities’. Utility cycling has taken great steps in developed countries, especially Europe, the United States of America, Australia and Japan.

Due to the social gain to be realized from increasing the share of bicycle commuters and the potential share of bicycle commuters, policy-makers in a number of countries, are showing increasing interest in encouraging cycling, academic researchers are also becoming increasingly interested in cycling.

The need to encourage the public to engage in active travel is seen as important in terms of a healthy and sustainable future community. Attitudes and behaviors of parents towards cycling and active travel are important determinants to whether or not children cycle (Wen et al., 2008), and cycling in childhood can influence cycling throughout life (Jones et al., 2012). However, there are frequently documented barriers to cycling for people of all ages, including feeling unsafe and vulnerable in heavy traffic, especially as a result of poor infrastructure and lack of segregated,
dedicated or prioritized routes for cyclists (Nankervis, 1999). It is also noted that when good infrastructure is put in place, it does not necessarily increase the amount of cycling (Welleman, 1997), perhaps because social norms are hard to overcome and concerns over safety dominate (TfL, 2009). The status of a non-motorized transport mode such as cycling seems to differ strongly between countries, ranging from the poor man’s mode to the sports mode that suits an active lifestyle. It is nevertheless striking that, despite the increasing policy and academic interest in cycling, little attention has been paid to cycling when compared with other modes of transport. In order to be able to develop sound policies that encourage cycling, it is essential that we understand what determines bicycle use.

The accessibility of the railway or bus stations, both at the home end and at the activity end of trips travelers face the problem of how to get to the station. Special attention is paid to the role of the bicycle as an access mode, since in many countries walking is an important access and egress mode to these stations. The bicycle is a potentially attractive access mode for railways since it allows travelers to avoid waiting at bus, metro or tram stops. Other advantages are that it is cheap, environmentally friendly and that it requires only modest parking space near the railway station. Most research into bicycle use identifies distance as a significant factor; indeed, for a great many bicycle research studies, respondents are even selected according to the travel distance. Bike commuters tend to live closer to their work than other types of commuters (Cervero, 1996). One should note that, for cyclists, resistance to travel probably increases disproportionately with distance due to the physical effort required (Van Wee et al., 2006). Moreover, there might be an ‘acceptable’ maximum travel distance that differs between individuals and also genders. Studies suggest that women cycle shorter distances to work than men (Garrard et al., 2008), with Howard and Burns (2001) suggesting 6.6 km for women compared to 11.6 km for men. This might be related to location and activity choices that differ between the sexes.

The importance of distance is further reflected in the relationship between town and city size and the mode share. In the Netherlands, small- and medium-sized cities have the highest bicycle share (Martens, 2004; Rietveld and Daniel, 2004), probably as a result of the proximity of the destinations involved. Research has identified a relationship between distance and the chosen means of transport. For distances between 0.5 and 3.5 km the bicycle is most often used (Keijer and Rietveld, 2000; Martens, 2004). In Sweden five kilometers is often used as a feasible bicycling distance in transport planning and one kilometer for walking (Wallberg et al., 2010). Iacono et al., (2008) stated that a maximum distance of 10 kilometers to the workplace was found to be a feasible commuter cycling distance.

Inexperienced cyclists, women and younger cyclists tend to consider bicycle facilities to be more important (Stinson and Bhat, 2005; Garrard et al., 2008). Stinson and Bhat (2004), and Martens (2007) all find that (commuting) cyclists consider safe bicycle parking to be important. Not all cyclists attach the same value to parking facilities, however. Men, younger people and individuals with more expensive bicycles consider secure parking facilities to be more important (Hunt and Abraham, 2007). Hunt and Abraham (2007) suggest that for people with expensive bicycles and younger people, this perception of importance is related to the relative value of their bikes.

Stinson and Bhat (2004) and Gatersleben and Appleton (2007) find that darkness has a negative effect on commuting by bicycle. In particular, women cyclists care more about the presence of daylight than men (Bergström and Magnusson, 2003). Most research concludes that men cycle more than women (Pucher et al., 1999; Howard and Burns, 2001; Rietveld and Daniel, 2004; Stinson and Bhat, 2005). The relationship between cycling and age is also ambiguous. Pucher et al. (1999) conclude that cycling levels decline with age.

Cycling infrastructure is defined as ‘dedicated cycle tracks, demarcated cycle tracks, widened footpaths for pedestrian/bicycle sharing and separate signalized bicycle crossings’. In fact, any infrastructure that contributes to the cycling circulation area (e.g., a traffic calmed area or minor
collector road) or facilitates cycling (bicycle parking lots), can be considered as cycling infrastructure.

2. BENEFITS OF CYCLING

The benefits of cycling are numerous; benefits comprise health and environmental issues as well as transport and the economic improvement of private and public households. Cycling has positive effects on the heart, muscles, bones, blood pressure, digestion, lung function and the reduction of cancer and diabetes risks (Friel, 1998). Cycling is an effective way of prevention, as it reduces spending on health care and climate change mitigation or emission trading and is beneficial to society (Sælensminde, 2003).

One-tracked bicycles can weave through the traffic jam and park in any place. On distances up to 8 km within urban settings (Dekoster and Schollaert, 2000 give an example for the European context), bicycles easily compete with other means of transport, including cars, busses and trains. Choosing bicycles instead of cars lowers the number of large motorized vehicles on the streets, speeds up the traffic flow and consumes less land for roads or parking facilities. In addition, this allows the design of human-centered public spaces, essential for safe urban life and social interaction. As cycling does not oppress the mobility and quality of life of others, contrary to motorized mobility, it is ultimately more democratic than other means of transport. Cyclists are not vulnerable to rising oil or ticket prices and spend much less on the purchase and maintenance of a bicycle than for motorized mobility. This enhances the socio-economic independence and mobility of each cyclist. Ultimately, building, enlarging and maintaining infrastructure for cyclists only requires a small percentage of what public funds spend on infrastructure for motorized traffic. In short, it can be concluded that “cycling resonates with the themes of autonomy and self-sufficiency and with environmental, social and economic sustainability, that are the hallmarks of alternative development models”, as Horton et al. (2007) put it.

Heinen et al. (2010) found in several studies that respondents frequently gave the following reasons for bicycling: health reasons, exercise/fitness, fun, flexible, convenient and enjoyment of attractive scenery.

3. FACTORS INFLUENCING BICYCLE USE

The literature in general shows that there are differences in the travel behavior of men and women. Kim and Ulfarsson (2008) found that females have a higher proportion of short automobile trips than males. Differences are also apparent with respect to active modes of transportation. Gatersleben and Appleton (2007) find that cycling is more common among men than women. This finding is corroborated by Stronegger et al. (2010), who find that men preferred cycling, while women preferred walking, in a study that assessed gender-specific links between local infrastructure and amount of walking and cycling for transportation. Stronger et al. (2010) also suggest that this is perhaps due to women’s feelings of perceived safety and choosing to access amenities at shorter distances from home due to household and family responsibilities. Likewise, Zhou (2012) finds that males are more likely to walk or cycle relative to females, but finds no gender differences for any of the other modes. Several studies show that women are more sensitive to cycling dangers than men (Garrard et al., 2008; Geddes, 2009; Pucher et al., 2010a).

From a social perspective, those who cycle perceive cycling more positively than those who drive (Xing et al., 2010), which is consistent with previous investigations of the social aspects of mode choice (Gatersleben and Appleton, 2007; Gatersleben and Uzzell, 2007). Although cycling rates do not vary much by income, it seems likely that low income persons cycle mainly for work trips and other utilitarian purposes, while high-income persons may cycle more for recreation and
exercise (Heinen et al., 2010). Similarly, low rates of car ownership are also associated with higher rates of cycling. Car ownership appears to have become a stronger determinant of cycling rates over the past decade. That is consistent with other studies examining the impact of car ownership on cycling levels (Pucher et al., 2011a; Stinson and Bhat, 2004; Rietveld and Daniel, 2004).

Literatures that reveals why people commute or does not commute by bicycle show that there are determinants for cycling include built environment (urban form, infrastructure, facilities at work), natural environment (hilliness and landscape, seasons and climate, weather), socio-economic factors (socio-economic and household characteristics), psychological factors: attitude, social norms, and habits, (attitudes and social norms, perceived behavioral control, habits, reasons for (not) cycling), cost, travel time, effort, and (safety, transportation costs, travel time and effort) Heinen et al. (2010). Previous research shows that climate and topography can affect cycling levels. Several studies find that cycling is deterred by rain as well as by very cold or hot weather (Bergström and Magnusson, 2003; Dill and Carr, 2003; Gatersleben and Appleton, 2007; Heinen et al., 2010; Nankervis, 1999; Stinson and Bhat, 2004; Winters et al., 2007). Almost all studies find that flat topography facilitates cycling, and that cyclists choose routes that avoid steep gradients (Hunt and Abraham, 2007; Rietveld and Daniel, 2004). Topography uninterrupted by harbors, bays, and rivers also favors cycling by enabling more direct routes (Pucher et al., 2011b). There are no comparable statistics for humidity, which raises the heat index and further discourages cycling during hot summers.

One might expect a city such as Portland, which is both hilly and rainy, to have little cycling, but in fact, it has the highest cycling rates in the USA, perhaps due to its comprehensive package of cycling policies.

Rastogi (2010) in his study determined the highest potential to shift to non-motorized mode from age group of 23 to 45 which is the economically active segment of the population and also that potential to shift decrease as occupational status increases. Arasan et al. (1994) identified the critical trip length based on factors such as sex, age, occupation and purpose. Each person’s decisions about bicycling are influenced by their spatial context, or the built environment. Heinen et al. (2010) categorize the built environment into three categories: urban form, infrastructure, and facilities at work. Two metrics of urban form are density and accessibility. Heinen et al. (2010) found that many studies suggest that trip distance is a large determinant in one’s decision whether or not to travel by bicycle. The longer the trip, the fewer individuals who are willing to travel by bicycle.

Heinen et al. also found that bicycling rates are impacted by seasons (e.g., winter, summer). Stinson and Bhat (2004) and Guo et al. (2007) (as cited by in Heinen et al., 2010) reported that “in the USA, cycling in the summer is more common than in other seasons.” This confirms what would seem logical. Other than weather conditions generally being colder, rainier, and sometimes snowy during non-summer seasons, they also found that the hours of daylight played a significant role: darkness has a negative effect on commuting trips by bicycle. That being said, it has also been found that Canadians, in general, have higher bicycling rates that the U.S., yet they have a colder climate and shorter days during non-summer months. However, in a Canadian study, Winters et al. (2007) found that cities with more days of precipitation per year and more days of freezing temperatures per year were both associated with lower levels of utilitarian cycling. These finding suggest that weather (and possibly daylight) is in fact a significant factor affecting bicycling rates but that it isn’t a dominating factor.

4. **STUDY PURPOSES**

a. To investigate the policies of some countries that have been especially innovative and successful at increasing cycling, that may provide valuable lessons for policy maker in other cities seeking to promote cycling.
b. To investigate the reasons of low level of cycling in Upper Egypt.
c. To predict the future and the possibility of higher level of cycling in Upper Egypt.
d. To suggest the required actions to encourage cycling.

5. CYCLING POLICIES AND PROGRAMS

Cities with successful bicycling policies can be found in many countries, providing experience about the most appropriate package of policies for local conditions is necessary. The high rates of bicycling in the Netherlands are the result of strong beliefs in the bicycle as a form of sustainable transport and in purposeful long-term transportation planning. Traffic planners and politicians have made a clear and rational decision to promote bicycles and discourage use of motor vehicles. Master Plan Bicycle was established within the Dutch Ministry of Transport in 1990, specifically with this aim (Welleman 1995).

For many years, Europeans and Americans have looked to the Netherlands for ideas on transportation planning and policy (Suzuki 1984), and “Master plan Bicycle,” shows why this tiny nation attracts such attention. This was the first time any country had established “an official national bicycle policy” (Federal Highway Administration 1992b). Remarkably, from an American standpoint, the policy was aimed at increasing bicycling and mass transit use and decreasing motor vehicle use. Along with building more bicycle paths and parking facilities, a major goal was to improve bicycle/public transport connections (Federal Highway Administration 1992b).

Virtually all the available evidence indicates that policies make an important difference: not only explicitly pro-bicycle policies but also transport policies in general, housing and land use policies, and car pricing and restraint policies. Designing the appropriate mix of policies for each city's particular situation requires careful planning and ongoing citizen input, especially from bicyclists. Emphasizing the proven health benefits of bicycling will be the key to garnering the public and political support necessary to implement a truly comprehensive package of policies. That multifaceted, coordinated approach offers the promise of substantial growth in bicycling, even in cities with low bicycling levels.

In short, bicycling has been thriving precisely in those countries that have adopted policies to make bicycling faster, safer, and more convenient. Bicycle use has been falling in those countries that have been neglecting the needs of bicyclists. With the right set of policies, bicycling can be greatly increased almost anywhere (Pucher, 1997). Importing the suitable policies to our community and adopting appropriate package of policies for local conditions will be helpful to the policy makers. A wide variety of infrastructure, programs, and policies to promote cycling are as follows:

5.1. Expansion and improvement of bikeway networks

In both Europe and North America, the main approach to increasing cycling and making it safer has been the provision of more and better bike paths and lanes (Heinen et al., 2010; Pucher et al., 2010a, b). The scientific evidence in the existing literature generally supports that strategy. Results from aggregate cross-sectional studies indicate that there is a positive correlation between cycling levels and the supply of bike paths and lanes, even after controlling for other explanatory factors such as city size, climate, topography, automobile ownership, income, and student population (Dill and Carr, 2003; Rietveld and Daniel, 2004). Disaggregate, individual-level studies report a strong preference for separate paths and lanes over cycling in traffic (Broach et al., 2011; Dill, 2009; Howard and Burns, 2001; Hunt and Abraham, 2007). Both stated-preference surveys and revealed-preference surveys find that women, seniors, and inexperienced cyclists, in particular, prefer riding on bicycle paths and lanes over cycling on streets without facilities (Garrard et al., 2008; Larson and El-Geneidy, 2010). Thus, there is considerable scientific evidence that improving cycling facilities is essential for increasing cycling.
5.2. Bike parking
There is a general consensus on the need to provide good bike parking for cyclists (AASHTO, 1999; APBP, 2010). There are few rigorous studies of the impacts of bike parking on cycling levels, but they confirm the importance of bike parking for cyclists, with a strong preference for secure, sheltered parking to prevent theft and protect bicycles from inclement weather (Hunt and Abraham, 2007).

5.3. Integration with public transport
Coordinating cycling with public transport is mutually beneficial, enhancing the benefits of both modes and encouraging more cycling as well as more public transport use (Brons et al., 2009; Martens, 2004, 2007). Cycling supports public transport by extending the catchment area of rail stations and bus stops far beyond walking range and at much lower cost than neighborhood feeder buses and park and ride facilities for cars. Access to public transport helps cyclists make longer trips than possible by bike. Public transport services can also provide convenient alternatives when cyclists encounter bad weather, difficult topography, gaps in the bikeway network, and mechanical failures.

5.4. Bike Sharing Programs
Following the boom in bike sharing programs worldwide, some cities now have bike sharing systems. There are rapid expansions of bike sharing in North America that may provide further impetus to the growth of cycling (Shaheen et al., 2010). The available evidence indicates that bike sharing programs in Europe have encouraged more cycling as well as improved coordination of cycling with public transport (Shaheen et al., 2010; Pucher et al., 2010a).

5.5. Training and Education
Some cities have some sort of bike training programs for children as well as adults, there is comprehensive bike training and traffic education programs in most German, Dutch, and Danish schools (Pucher and Buehler, 2008). Unlike northern Europe, cycling training programs in North America are offered in only a small percentage of schools, thus reaching a limited number of children.

5.6. Information and Promotional Programs
Distribute free printed bike maps as well as interactive, on-line versions that permit trip planning, allowing cyclists to choose routes with the shortest distance, least traffic, least pollution, most vegetation, fewest hills, or most separation from motor vehicle traffic (Su et al., 2010; UBC, 2010), offering a wide range of information on cycling routes, parking, safety, training, special events, recent and proposed projects (City of Portland, 2010a; NYCDOT, 2011).

6. CYCLING POLICY AND PRACTICE IN UPPER EGYPT

6.1. Interviews Results
In each country, work and education are the dominant motives, irrespective of public transport type. These high shares can be attributed to the high trip frequency of commuters and students both groups tend to make the same trip every weekday, and may thus be expected to search for the most economic way to cover the distance between home address and public transport stop. Khattak et al. (2011) argue that “exploration of students’ behavior can be instructive and reveal valuable information about associations with the built environment and the extent of differences in travel compared with the general population.” Second, a key aspect of studying university populations is that modal choices among university/college students often display a higher share of
alternative modes compared to the general population, and thus all modes are well-represented in the analysis. It is possible that a better understanding of the travel behavior of students, who tend to use alternative commuting modes more frequently, can generate valuable information about factors that may help to sustain the habit of active transportation. Several studies show that college students are among the most likely to cycle, so that cities with high shares of students tend to have higher bike mode shares (Dill and Carr, 2003; Heinen et al., 2010). Accordingly the questionnaire through direct interviews with students male and female has been performed (students from different stages). A total of 925 students were surveyed during 2013.

The results of the survey can be summarized as follows:

1. 62% of the interviewees have positive memories of cycling from childhood.
2. Social norms prevent female from riding bicycle in public areas.
3. About 59% of the interviewees consider cycling to be used for poor people (feeling of poverty).
4. The main reasons given for not cycling in Minia city were: high chance of bike theft, danger, no bike lane, no safe parking, low-acceptability of cycling as a transport mode because of social norms and culture.
5. About likelihood of cycling in the future if there will be suitable environment for cycling such as safe parking, bicycle lane, culture change, etc. 58% of males and 22% of females may be use bicycle, 23% of males and 17% of females not likely to use bicycle, and 19% of males and 61% of females will never use bicycle as a mode of transport.
6. About the opinion of the interviewees of how to encourage cycling, they suggest that: 1) by seeing famous and high status people riding bicycles as a model in media 2) construction of bicycle lane 3) safe parking areas 4) and the change of culture that prevent female from cycling and considers cyclist as a poor peoples.

6.2. Overview Location and Setting

Minia city is the capital of Minia Governorate in Upper Egypt; the governorate is one of the most highly populated governorates of Upper Egypt. It contains nine cities. It is located approximately 245 km south of Cairo on the western bank of the Nile River, Minia Governorate has longitudinal distribution, its length is about 135 km from north to south and its average widths is about 18 km from east to west. Its area is about 32279 km².

The population of Minia governorate is 4762000 according to Census in 2012. 2431000 of them are male and 2331000 are female (CAPMAS, 2012). Minia population constitutes 5.8% from the total population of Egypt, population estimates by age group in 2012 showed that 42.8% from the total population of Egypt is in the age range of 15-40 years. Minia city is mostly flat, The road network, is very diverse, depending on different parts of the city, as well as some popular neighborhoods have mainly narrow, non paved streets without sidewalks.

The general condition of the road network including lightning, pavement, lanes, sidewalks etc. ranges from good in some areas to very deficient in areas where informal housing is predominant and public investments in infrastructure are rare. Especially for short distance trips within neighborhoods, bicycling is used in Upper Egypt at low levels. The risk that cyclists faced are most probably crashes in frequent potholes and other deficiencies in the road pavement, particularly in the darkness. Streets are mostly one-way. In many cases, sidewalks are used for commercial purpose and some of them are reduced to a minimum (of 50 cm and less) or even inexistent. Lightning is provided inside the city.

The location of a public transport stop or station can have a substantial influence on the level of cycling. For Minia city all public transport from/ to Minia city such as train station bus terminals and shared taxi terminals located at the center of the city and the maximum distance from the city center to anywhere in the city less than 5 km. Figure 1 shows the urban distribution of Minia city.
6.3. Climatic of Minia Governorate

Köppen-Geiger climate classification system classifies Minia Governorate climate as hot desert. The climate is characterized by hot summers and cold winters. Temperatures can reach from 26 to 40 degrees from June to August, and from 4 to 17 degrees from December to March. The average humidity levels is about 52 %, there are very few rainy days with at maximum 2 mm average precipitation. Luxor, Minia, Sohag, Qena and Asyut have the widest difference of temperatures between days and nights of any city in Egypt, with almost 16 °C difference. The city of Minia is located tightly between two ranges of about 500 m-mountains on both western and eastern sides, and interestingly falls away from the Mediterranean Sea and the Red Sea. Hence, these conditions give the city, nearby towns and villages similar properties of continental climate. Meaning that, the city has cold winter weather, and hot but non-humid summers. Hail or snow is extremely rare due to Minia's low precipitation averages, frost will occasionally form on cold winter nights. The average annual rainfall in Minia is 0.52 mm, M. A. Zahran (2009). There is evidence that cold weather decreases the probability of selecting non-motorized modes (Kuhnimhof et al., 2010), however, the coldness in Upper Egypt is not severe to that degree. In terms of relevance for cycling, the city has nearly flat terrain, dry and hot weather during daytime that prove to be favorable for cycling most of the year. The climate data for Minia governorate is shown in Table 1.

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<th>May</th>
<th>Jun</th>
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<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Average high °C</td>
<td>20.4</td>
<td>22.4</td>
<td>25.8</td>
<td>31.2</td>
<td>35.4</td>
<td>36.9</td>
<td>36.6</td>
<td>35.9</td>
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<td>31.3</td>
<td>25.9</td>
<td>21.4</td>
<td>29.77</td>
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<tr>
<td>Daily mean °C</td>
<td>11.7</td>
<td>13.5</td>
<td>16.8</td>
<td>21.9</td>
<td>26.2</td>
<td>28.4</td>
<td>28.7</td>
<td>28</td>
<td>26.1</td>
<td>23</td>
<td>17.7</td>
<td>13</td>
<td>21.25</td>
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<tr>
<td>Average low °C</td>
<td>3.9</td>
<td>5.2</td>
<td>8.2</td>
<td>12.6</td>
<td>16.4</td>
<td>19.3</td>
<td>20.4</td>
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<td>15.5</td>
<td>10.2</td>
<td>5.8</td>
<td>13.02</td>
</tr>
<tr>
<td>Precipitation mm</td>
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<td>0.0</td>
<td>1.0</td>
<td>0.0</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.42</td>
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<tr>
<td>% humidity</td>
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<td>56.0</td>
<td>52.0</td>
<td>43.0</td>
<td>37.0</td>
<td>40.0</td>
<td>46.0</td>
<td>51.0</td>
<td>53.0</td>
<td>55.0</td>
<td>61.0</td>
<td>67.0</td>
<td>52.0</td>
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</table>

Source (Minia, Egypt: Climate, 2013)

Figure 1: Minia City Urban Distribution
6.4. Social, cultural and gender norms

While cycling is a common necessity for a considerable part of the Egyptian society and the negative effects of motorized mobility are one of the most important conversation topics in Egypt, there is little or no conscience about the bicycle as a full-fledged mobility alternative. One of the reasons is the common, outspoken belief that cycling is for the poor. This depreciative belief seems to apply at any time, no matter whether a cyclist rides a cheap or expensive bicycle. The car is a main status symbol and as social control is high, a considerable number of Egyptians – especially academics and students – seem to approve of bicycle traffic in theory but would not dare to switch to it, partly because of social stigma. While the general social stigma of choosing a bicycle seems to apply to both men and women, women are also confronted with conflicting gender norms. As projects in the field of sports and gender empowerment show, there are several factors that prevent women from doing sports including cycling: In general, girls are allowed less to play, second the female body being exposed by moving in public is often considered inappropriate, and third sexual harassment on the streets. In fact, many Egyptians – male and female – are members of private sports clubs in Cairo and Alexandria, but sports is generally banned from public space, which makes race cyclists and mountain bikers still a rare and strange view to many.

In theory, there is no discrimination against gender in cycling. Though, surveys show that in reality, no cyclists from female in Upper Egypt, only you can see some females' cyclists in their early ages (childhood). On the streets, cyclists are often disrespected by the drivers of motorized vehicles, as it also occurs with pedestrians. Cyclists suffer from stigmas such as being poor or inferior. The cultural norm as a whole favors motorized vehicles. There is no infrastructure has been realized so far for bicycling. Despite tremendous environmental, social and infrastructure costs, individual motorized mobility continues to receive high government consideration and spending.

6.5. Urban Planning and Cycling Policies

There is definitely cycling practice, but nothing such as a cycling policy in Egypt, and so far the non-motorized transport is still absent from the official discourse about mobility patterns. The traditional traffic policy stays nearly unchanged: more highways for more cars (Serrano, 2009). In recent years, suggestions and initiatives concerning cycling policy and practice by members of the civil society, researchers, journalists and NGOs have appeared in Cairo.

6.6. Mobility and Cycling Practice

In the same way as the bicycle is absent from transport policies, there is no statistical data about the effective number of trips it is used for in Minia. Statistics show mainly that motorized traffic has been rise since several decades now. The number of privately owned cars in Egypt has reached about 3.23 million in 2012, an upward trend. Generally, in Egypt people who cannot afford a car will use other forms of motorized transportation: taxis, private or public buses or private microbuses.

In upper Egypt there is no statistical data about walking, however it is common practice as a reason of the economic nature: A private or public buses or private microbuses or taxi ride currently costs L.E.0.50 to L.E.5.0 ($0.075 to $0.75), which adds up for the poor. Although never taken into account in transport statistics or policies, the bicycle proves its efficiency on a daily basis. The bicycle is a popular and generally well accepted toy for children, especially for boys; in general, in accordance to social norms, cycling as a leisure activity is limited to childhood and early youth. Egyptian government as well as Minia Governorate doesn't introduce a short or long-term strategy to encourage people to use more sustainable modes of transport (WHO, 2013).
6.7. Factors favorable for non-motorized development in Upper Egypt

There are necessity of developing a non-motorized culture in urban environment in Upper Egypt, some factors which are favorable for such a development are as follows: The two major factors which can be attributed in favor of non-motorized development are the high percentage of low income and middle income groups, and the high percentage of short trips existing in Upper Egypt cities. The World Bank Official Website had classified Egypt a lower middle income economy which points to the presence of high percentage of middle income groups. Another factor favorable for non-motorized traffic development is the number of short distant trips made in urban cities. As indicated by Rastogi (2009) in his work, European cases show that bicycle is far more superior below 5 km. The city has nearly flat terrain, dry and hot weather during daytime that prove to be favorable for cycling most of the year.

6.8. Problems hindering cycling in Upper Egypt and factors affecting it

Laxman et al. (2010) had mentioned that in Indian cities pedestrians are forced to walk along the carriageway along with the vehicular traffic even when foot paths are provided because of the encroachment by hawkers, vendors and shoppers which increase the chance of conflict between pedestrians and motor vehicles, and that is similar to what happen in Egypt. There is a lack of proper foot paths and cycle tracks which often compels the commuter to use the road along with the motorized vehicles.

Heinen et al. (2010) found in several studies that respondents frequently gave the following reasons for not bicycling: too dangerous, too much traffic, bad weather, personal factors, lack of daylight, inconvenience, lacking sufficient fitness, uncomfortable, lack of time, being too tired, too much effort, the bicycle being an uncharacteristic transportation mode, and difficulties with trip-chaining (Gatersleben and Uzzell, 2007 as cited by in Heinen et al. 2010).

So it is worth assuming that in Upper Egypt due to the poor infrastructure provided a lot of potential non-motorized commuters are forced to resort to other modes which are generally perceived safe. Hence the advantage of providing infrastructure is twofold 1) to reduce the fatality rate 2) to improve the safety perception of commuter to promote their shift to non-motorized modes.

The second problem which reduce the usage of non-motorized modes especially the bicycle is the general socio-cultural stigma that these modes are for poor people. The study done by Rastogi (2010) found that shift to walking and bicycling from high income groups are negligible compared with the low income group. In countries like Netherlands it can be observed that cycle is integrated as part of culture and not as poor man’s vehicle. There is need for changing the mindset of people in Egypt and this could only be done through awareness programs emphasizing on importance of walking and bicycling as sustainable and environment friendly modes.

7. REQUIRED ACTIONS TO ENCOURAGE CYCLING

Literature shows that, some individual interventions can increase bicycling to varying degrees, but the increases are not usually large. That does not mean that individual interventions are not important, however, they are most effective as a part of a more comprehensive effort (policies). Substantial increases in bicycling require an integrated package of policies. Those policies may include infrastructures provision and pro-bicycle programs, as well as supportive land use planning and restrictions on car use.

Non-motorized modes are neglected presently in the planning process and there are no polices for cycling in Egypt. One of the reasons for this neglecting is the lack of acceptability of non-motorized mode among policy makers as a main mode. The main factor which makes the policy makers ignore bicycling is the lack of understanding of its benefits. Policy makers considers motorized mode provide revenue to the government through taxes while non-motorized modes not.
In order to change this attitude a complete understanding regarding the economic and other benefits of non-motorized traffic is necessary.

Riding the bicycle has considerable benefits for both, the cyclists and the community, but it’s everyday usage and future potentials can only be assessed and understood within the local context. Thus, the pre-requisites for cycling comprise not only favorable infrastructures or climatic conditions, but also - for instance - safe streets and respectful behavior in public spaces in general. Taking these factors besides cycling policies into consideration, a higher rate of cycling in the future would be obtained. Generally, if the government has desire for non-motorized modes of transport in Egypt, it should first improve/change certain basic factors which hindering people from using it, through the construction of suitable infrastructure for cycling and pedestrians and the promotion for non-motorized modes in media.

8. CONCLUSIONS AND RECOMMENDATIONS

A clear message emerges from the literature in this research is: Substantial increases in bicycling require an integrated package of policies. Those policies may include infrastructures provision and pro-bicycle programs, as well as supportive land use planning and restrictions on car use. There are many policies for encouraging cycling found in literature, it is necessary to use the suitable policies to our community and to local conditions.

In a country like Egypt a general increase of public transport fares may easily have good effect on the environment because in addition to its reduction in travel-generating, its main effect is an increase in the use of non-motorized transport modes.

Minia city has flat topography and hot-dry weather in summer and cold but not snowy weather in winter, which gives it advantages compared with other countries with high cycling ratios. That means with applying some policies and promotions for cycling, people may adopt bicycle as means of transport, which will increase level of cycling.

The main reasons given for not cycling in Minia city were: high chance of bike theft, danger, no bike lane, no safe parking, low-acceptability of cycling as a transport mode because of social norms and culture. The likelihood of cycling in the future if there will be suitable environment for cycling such as safe parking, bicycle lane, culture change, etc. 58% of males and 22% of females may be use bicycle, 21% of males and 23% of females not likely to use bicycle, and 15% of males and 55% of females will never use bicycle as a mode of transport.

About the opinion of the interviewees of how to encourage cycling, they suggest that: 1) by seeing famous and high status people riding bicycles as a model in media 2) construction of bicycle lane 3) safe parking 4) and the change of culture that prevent female from cycling and considers cyclists as a poor peoples.

There is high-potential for non-motorized transport in Upper Egypt. Therefore, there is an urgent requirement for policy makers to include non-motorized transport in their agenda. Researchers also need to contribute to confront the issues in developing and planning non-motorized traffic considering all aspect affecting cycling. They need to clearly define the role of non-motorized modes and have to envisage ways in which these roles could be implemented.

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