

Abridgment

Linking Europe and Africa Through Greece: A Transportation and Development Study

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This study examines the way transportation can be used to facilitate the worldwide trend toward economic integration and the resultant economic benefits through trade for both Europe and northeast Africa. The emphasis is on northeast Africa, however, because of its state of underdevelopment. In general, transportation networks in northeast Africa are poorly developed. Historically, these transportation networks have tended to form separate systems that are oriented outward to ports that have few links among African countries. Recently, African countries have upgraded their transportation networks and started to forge links among each other. This development is still in a premature stage, but it is considered very desirable in facilitating the development of northeast Africa. The major hypothesis of this paper is that, by promoting the development of a permanent, continuous transportation axis that links Europe and northeast Africa through Greece, as well as various African countries to each other, transportation costs can be reduced, which will facilitate economies of specialization and scale through trade. In addition, this transportation axis would facilitate the development of areas that have agricultural, mineral, and industrial potential that are previously unexploited because of limited access.

The need for faster and more reliable transportation is introducing significant changes to the traditional patterns of cargo transportation among countries. One of these changes is the trend toward the combined transportation of goods, which is an increasingly popular way of handling world trade. By using this concept, one of the potential routes between Europe and Africa recommended for further study by the International Road Federation (IRF), namely the route that links Europe and northeast Africa through Greece, is evaluated. The study is therefore concerned with the development of both Europe and northeast Africa. As regards the spatial and economic implications of such a link, however, emphasis is on northeast Africa because this part of the study area is underdeveloped compared with Europe. In addition, future land transportation networks in northeast Africa are expected to be markedly influenced by such a link, whereas the effect on the land transportation networks of Europe is expected to be marginal.

EXISTING TRANSPORTATION NETWORKS

Transportation networks in northeast Africa are poorly developed compared with those in Europe because of the generally low level of economic development of the area, scarcity of agricultural land, and vast deserts (Figure 1). In Europe, particularly in Western and Central Europe, the road and rail networks are almost complete. Projects are also under way for the improvement and development of the respective networks of Eastern Europe and Greece. Of these, the Trans-European Motorway (TEM), which links Poland, Czechoslovakia, Austria, Hungary, Rumania, Yugoslavia, Bulgaria, Greece, and Turkey, is the most important. In Greece, as well as the above mentioned project, there is an ambitious program of railway modernization, which is striving for significant network improvements by 1985. In northeast Africa, on the contrary, the road networks are incomplete and many are missing. In addition, these transportation networks tend to form separate systems orientated outward to ports that have few links among the northeast African countries. As a result of the nature of these transportation networks and because of the low level

of economic development, little secondary economic activity has located within the northeast African countries.

Recently African countries have upgraded their road networks and started to forge links among each other. The United Nations Economic Commission for Africa (UNECA) and IRF have proposed the construction of 10 700 km of roads at a cost of \$1 billion (1978 U.S. dollars) of which 6400 km require engineering studies. The major hypothesis of this paper is that, by promoting the development of a permanent continuous transportation axis that links Europe and northeast Africa through Greece, the implementation of the road construction program for links among African countries will be triggered off, which will facilitate the development of northeast Africa. The major advantage of such a transportation axis would be the reduction of transportation costs and facilitation of economies of specialization and scale through trade.

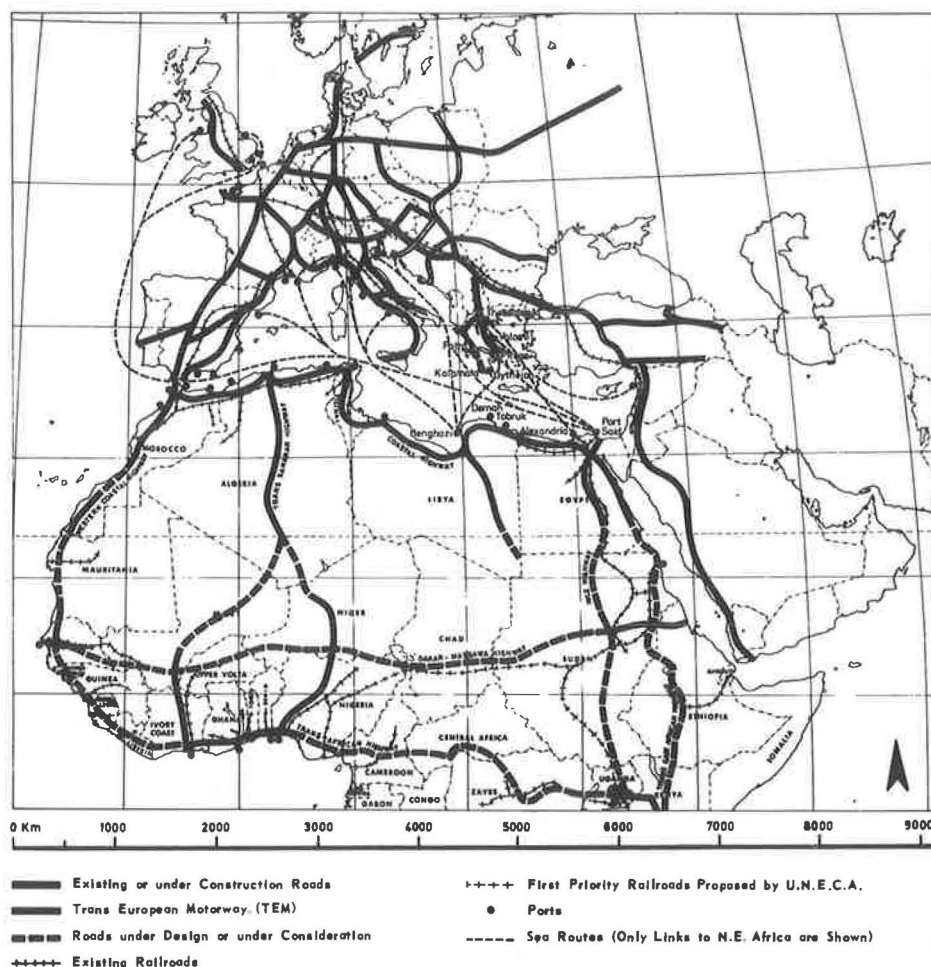
EUROPE-NORTHEAST AFRICA TRANSPORTATION AXIS

The proposed axis would require a permanent link between Europe and northeast Africa in contrast to that provided by a general cargo service. This can be best realized by roll on-roll off (RO-RO) or container roll on-roll off (CO-RO) vessels, which will result in faster and more reliable deliveries than those achieved by a conventional general cargo service--aspects that are very important to prospective freight forwarders. For example, a conventional general cargo vessel covers the Bremen-Alexandria trip in 25 days; however, the same distance can be covered in 10 days if a truck and RO-RO are used through Greece.

To determine the potential of the RO-RO link in greater detail, the economic structure and trade patterns of the countries of the study area were considered and marked differences were revealed between European and northeast African countries. The former are in an advanced stage of industrialization and have highly developed economies; the latter are still primary-sector economies where agriculture and mining prevail and raw materials are shipped to more-developed economies for the secondary economic activity of processing. Consequently, there are major differences in European-northeast African trade because Europe mostly exports finished products and imports raw materials from northeast Africa. Also, exchanges between Europe and northeast Africa constitute 65 percent of northeast African trade and only 2 percent of European trade. Between 1972 and 1976 European exports to northeast Africa grew in value at an annual rate of 23.4 percent compared with a growth rate of 11.4 percent in northeast African exports (excluding Libyan oil) and 14.4 percent (including Libyan oil).

A limitation of the permanent link between Europe and northeast Africa that uses RO-RO vessels is that it can only be used for general cargo. In 1975, the volume of general cargo trade between Europe and northeast Africa amounted to 11.0 million tons, of which 7.5 million tons was toward Africa and 3.5 million tons toward Europe. This unevenness of

Figure 1. Major transportation infrastructure in Europe and Africa.



trade flows is another operational limitation of the link. Three European countries, Spain, Portugal, and Italy, account for 32 percent of the trade and are not considered potential customers of the link; 8.5 million tons of cargo remains, which is expected to at least double by the year 2000, by which time the population of northeast Africa is also expected to virtually double. Note that another permanent RO-RO link between the ports of Volos, Greece, and Tartous, Syria, operates profitably on less than 1 million tons of general cargo and almost all traffic is unidirectional. In view of these factors and the location of Greece at the southeastern edge of Europe as well as its present political and economic role as the 10th member of the European Economic Community, a new RO-RO link between Europe and northeast Africa through Greece should have even greater economic potential.

Assuming, therefore, that this type of link is feasible, alternative possibilities for the alignment are considered. After a detailed consideration of the ports and land transportation facilities in the study area, as well as the distribution of existing and potential economic activities in northeast Africa, it is concluded that, in the short- and medium-term, the link between Volos, Greece, and Port Said, Egypt, which follows an eastern alignment along the Nile, would probably be most suitable. In the long term, an alternative or additional link could develop between the ports of Kalamata or Thessaloniki in Greece and Tobruk in Libya, which will follow a western alignment through Kufra, Libya, with a connection either southward to Chad or eastward to the Sudan.

These two alternative alignments are evaluated in terms of their general development impacts on Africa. In Figure 2, the existing distribution of economic activity (agriculture, mining, and manufacturing) and the agricultural potential of the study area are indicated. They are converted into general development potential in Figure 3. On the basis of population projections for the year 2000, the large urban agglomerations expected to develop in the study area are also indicated. Finally, the major transportation axes either in existence or those that have the potential of developing by the year 2000 are presented diagrammatically. It is quite evident from these maps that the eastern alignment has great potential as a permanent continuous transportation axis. It links many northeast African countries and facilitates international and inter-African trade. It also links a number of significant urban systems, passes through concentrations of existing economic activity, and will serve a large area of agricultural and mineral potential.

By facilitating the development of this axis, freight travel times will be reduced by 30-60 percent, reliability of deliveries will be greatly improved, transportation costs will be reduced, and transportation inputs will be substituted for other factors of production. The result will be economies of specialization and scale through trade. More specifically, the African countries will realize new comparative advantages in the production and export of certain goods. As a result of increased transportation efficiency, it may become economical for these countries to start processing more raw materials instead of exporting these unprocessed. Al-

Figure 2. Distribution of economic activity in northeast Africa.

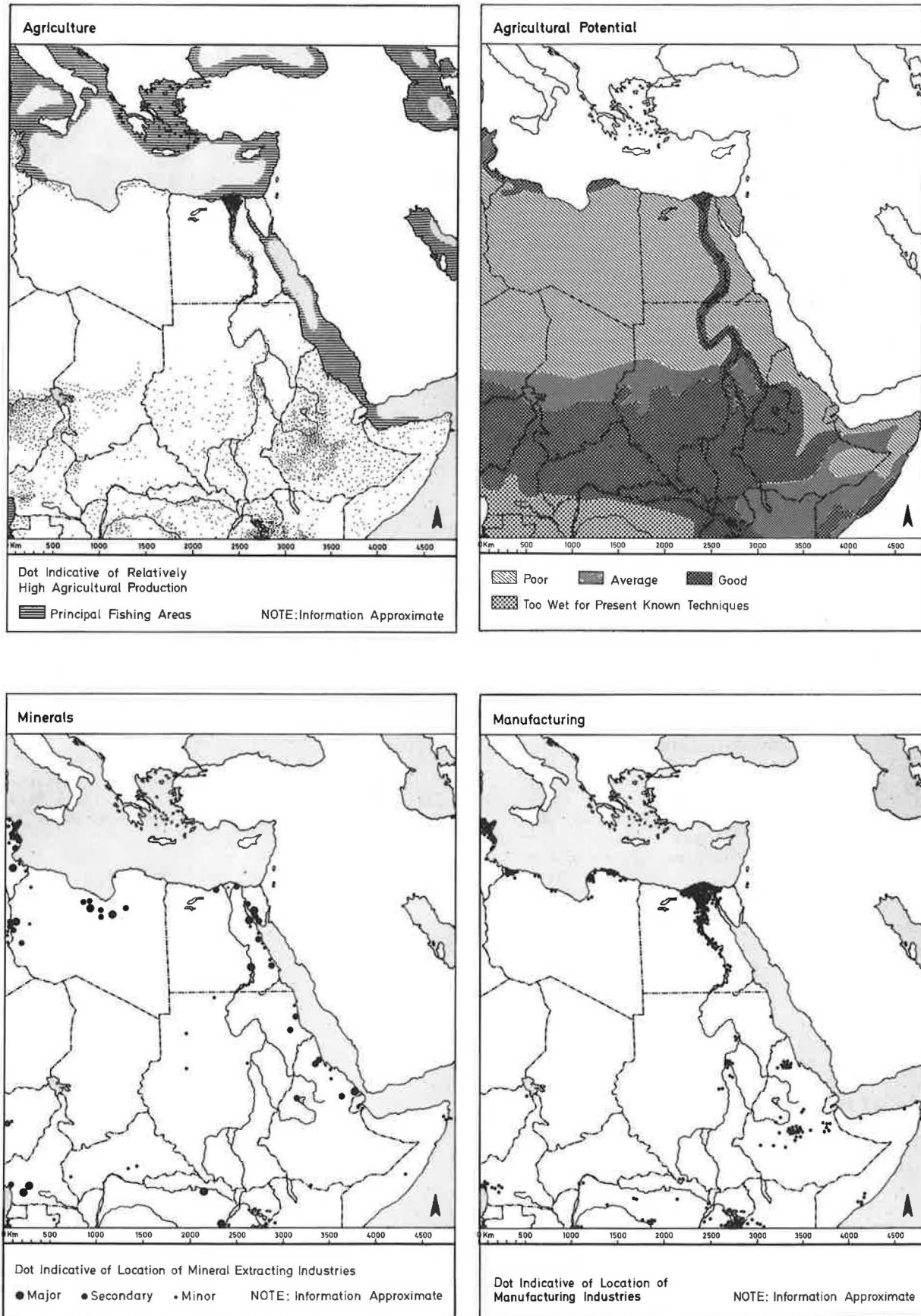
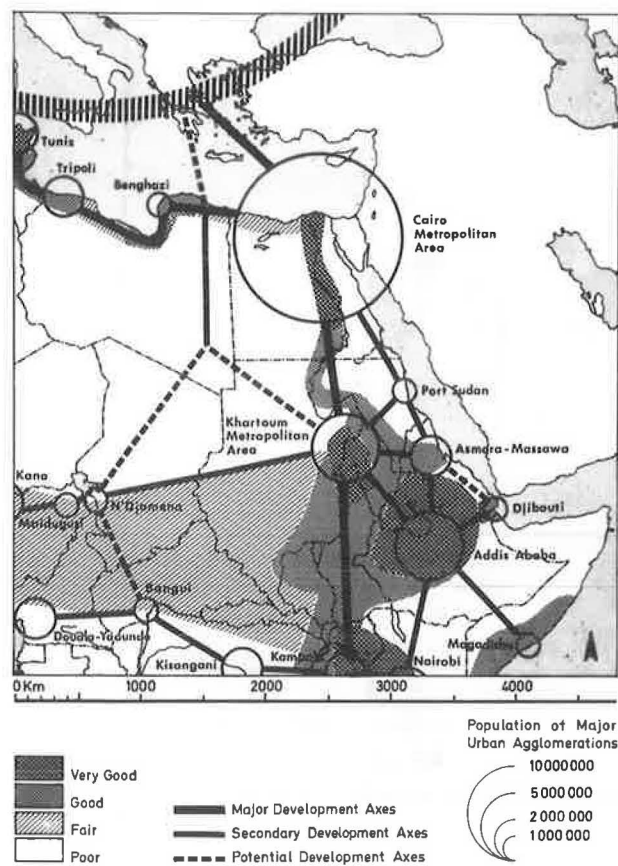


Figure 3. General development potential, year 2000.



though trade between Europe and northeast Africa will still tend to be that of northeast Africa--exporting mostly unprocessed materials and importing finished goods--the semiprocessing of raw materials is expected to become more economical, which is advantageous because of the value added. In addition, the linking of urban systems will result in positive scale effects, such as the increased size of the markets. This will provide new opportunities for the location of market-orientated industries. Finally, the transportation axis is expected to

trigger the development of agricultural, mineral, and industrial potential previously not exploited because of limited access.

Although the western alignment does not at present have any potential as a trade route, it may have a completely different potential, namely, that of opening new resource frontiers. In the past, a symbiotic relationship existed between any transportation route and economic activity. Roads were first developed to serve areas of known agricultural and mining potential. With the development of the transportation route, new areas of agricultural and mineral potential were discovered and more roads were then developed to serve these as the cyclical process continued. The development of roads along the Nile is a good example of this process serving either agricultural or mining activities. In the case of the western alignment, its major potential is in opening new resource frontiers and the important question is whether it is necessary to first construct the road before determining the mineral potential of the adjoining land. With remote sensing techniques and mobility other than road transport, it is more advisable to determine the mineral potential to some extent before investing in the road.

CONCLUSION

In conclusion, the research supports the major hypothesis of the paper that there is a case for promoting the development of a permanent, continuous transportation axis to link Europe and northeast Africa as well as to link various African countries. A spillover of this research is the substantiation that transportation routes have different potentials depending on the nature of the economic activity along the alignment. Finally, this study indicates the role of transportation in facilitating the worldwide trend toward economic integration in northeast Africa.

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Graduated System of Fees for Automobile Registration in Virginia

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A system of graduated registration fees based on the classification of the automobile stock into subcategories by weight is examined for Virginia. The feasibility of such a fee system and other alternatives for classification of the automobile fleet are explored. An econometric forecasting model based on a series of multiple-regression equations is then developed to model the weight classification scheme and to determine the potential impacts of such a system of registration fees on the transportation revenues of the Virginia Division of Motor Vehicles. Registration revenues are expected to decline under any tax scheme. However, a weight-based system of graduated fees that favors smaller

automobiles will precipitate the decline. Under the moderate-inflation scenario, the loss may amount to well over \$6.5 million/year by 1985. Future fuel and automobile prices will merely dictate the speed and the degree of loss in revenues.

The Division of Motor Vehicles (DMV) of the Commonwealth of Virginia receives revenues from 16 sources. More than 90 percent of these revenues