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Simone Gunzenhauser

**THE ISRAEL-JORDAN BORDERLANDS IN THE ARAVA VALLEY:
DIFFERENTIAL DEVELOPMENT AND PROSPECTS FOR CO-OPERATION**

ABSTRACT

The area of study extends from south of the Dead Sea to the shores of the Gulf of Aqaba/Eilat. The Arava Valley is divided between Jordan and Israel, having a desert environment marked by high temperatures and low precipitation. The boundary was disputed from 1948 until the Jordanian-Israeli Peace Treaty on the 26th of October 1994. This border situation led to different settlement patterns on either side: the Israeli side was settled with Kibbutzim and Moshavim to secure the borders, whereas the Jordanian side stayed largely untouched because of the extreme conditions.

Jordan and Israel share a common hydrogeological system in the Arava Valley, which has not as yet been fully investigated. This will only be possible through transboundary co-operation. Further areas of co-operation include agriculture, infrastructure, industry and tourism. Projects for co-operation in these areas were discussed between the two countries at the Casablanca Summit in October 1994. Each chapter of this thesis analyses the differences and commonalities between the two borderlands in the activities mentioned above, and assesses the prospects for future co-operation. The conclusion compares possibilities for co-operation in the Arava Valley with other selected borderlands in the world where transboundary co-operation already exists. Most cases seem to show that one party is likely to benefit more than the other, at least in the short-term.

**THE ISRAEL-JORDAN BORDERLANDS
IN THE
ARAVA VALLEY:**

**DIFFERENTIAL DEVELOPMENT
AND
PROSPECTS FOR CO-OPERATION**

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A thesis presented for the
degree of Master of Arts
at the University of Durham.

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September 1995



2 JUL 1996

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Dedicated to Andrew and my parents

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Chapter 1

INTRODUCTION



Figure 1.1 The Israel-Jordan frontier zone near Aqaba/Eilat in March 1994

The 180 km long international boundary in the Arava Valley extends from the south of the Dead Sea to the shores of the Red Sea. With its adjacent borderlands this is probably one of the world's most interesting cases of how a sealed boundary can affect the development of its adjacent borderlands, and how this development might affect future prospects for transboundary co-operation.

Until the peace treaty between Jordan and Israel on the 26th of October 1994 the Arava Valley was divided by the boundary. The boundary, running along the Arava was sealed, and the frontier zone was mined. Crossing the boundary was impossible.

The decades of closure of the boundary shaped the appearance of the borderlands on each side. Today the boundary in the Arava Valley represents a sharp line between two different political systems, two different cultures and two different religions.

However, with the peace treaty there is the chance, for the first time in forty years, for interaction between the adjacent borderlands. This interaction might even take the form of transboundary co-operation, which could lead to positive economic development and, therefore, to long-lasting peace between the two countries.

This unique situation in the Arava offers a wide range of subjects of interest to social scientists. Not only can the appearance of the border landscapes be studied, but also all various aspects of borderlands, including their inhabitants. In the future the prospects for transboundary co-operation might offer a wide field to study.

However, there have been studies into borderlands in the past, with theories about borderlands and the development of their study. This chapter will give a short overview of borderland studies and the related theory, starting with the origin of borderlands.

Borderlands are dependant on the existence of boundaries, which themselves limit the territory of states. As Glassner (1993,p.61) remarked, " all modern theories about States agree on at least one thing: a State must have territory". Over the centuries the limitation of the territory was denoted by frontiers. According to Glassner (1993,p.72) and Prescott (1987,p.36ff) the first states were only separated by areas, the so-called frontiers. Prescott (1987,p.36) also refers to frontiers as the zone of division between settled and uninhabited parts of one country. Then in the last century the world map was divided

by lines, the so-called boundaries. The frontier as a zone of transition disappeared and was replaced by a boundary, which very often became a line of friction.

However, today states try to diminish the effects of the line of separation through transboundary co-operation. The boundary is replaced by borderlands, which represent a zone rather than a line. Ideally, it represents a zone of transition rather than a zone of division such as the frontier.

This development is reflected in the study of boundaries: first the demarcation, delimitation and the limitation of sovereignty was of interest; then the boundary as a conflict generating object was discussed; only after the Second World War was the necessity of transboundary co-operation and the study of borderlands of interest to scholars. Considering the long tradition of boundary studies, borderland studies are quite a young discipline in political geography. As Drysdale (1994,p.21) remarked, "traditionally, political geographers who study boundaries have focused mainly on their evolution, morphological characteristics, and conflict-generating potential."

However, he also acknowledges that increasingly "some have concerned themselves with the functions boundaries actually perform, particularly as barriers to spatial interaction" (Drysdale,1994,p.21).

Minghi (1991,p.17) also notes that "the analysis of border landscapes in political geography has generally been directly related to the study of boundaries". This has been conflict orientated and he argues for a new focus on boundary studies, one which will encourage research on the more normal situation in boundary landscapes. He argues that the change from conflict to harmony is very clearly reflected in the evolution of border landscapes. For

example, after the last world war, The Alpes Maritime were characterised by emigration, separation of whole communities, and entire valleys were flooded by France for the water needs of the Cote D'Azur, and the Roya Valley railway was neglected. There was no co-operation between Italy and France, with borderlands being remote from the main national centres. Forty years later there is a growing economic relationship, a transborder park and a restored railway. As Minghi (1991,p.22) wrote, "Scenes of war destruction and abandonment from a generation ago are now replaced by the evidence of peace and co-operation behind the decision to rebuild".

And as Prescott (1987,p.159) remarked, "political geographers are interested in boundaries because they mark the limits of political organisation which varies over the Earth's surface, and these variations as a result are likely to be most clearly seen in the neighbourhood of the boundary". However, he also mentions that only a few writers have selected this subject as the focus of their study.

1.1 SPATIAL IDENTIFICATION OF BORDERLANDS

Adejuyigbe (1989,p.28) in his discussion of the difference between a frontier and a borderland, came to the conclusion that "whilst frontier continues to be used for the zone of expansion before boundary delimitation, borderland should be restricted to the post-boundary". Undoubtedly, borderlands are a result of boundary-making as already mentioned above.

Adejuyigbe (1989,p.29) believes that there are three ways to identify borderlands: by reference to the frontier which existed before boundary delimitation; by reference to administrative units close to the boundary; or by treaty.

There are various examples in the world where the borderlands are delimited by a treaty. The treaty might give the right of free movement within the zone or other privileges, such as tax advantage or special concessions to company's investing in the borderland. Adejuyigbe gives the example of the European Union where the width of a borderland is officially 20 km. Another example he gives is the borderland between Italy and Yugoslavia. This zone was fixed in a treaty, and can be up to 30 km depending on changing needs. The width of the U.S.A borderland with Mexico was about 240 km, but was limited to about 40 km. In this zone Mexicans were apparently allowed to move freely.

However, Adejuyigbe realises that using a treaty can cause difficulties if the zone cuts across a local government area or other important administrative units as it might cause administrative and planning problems.

Adejuyigbe claims that the advantage of defining borderlands by reference to the frontier as a zone of conflict or of cultural competition, is that it shows the reality on the ground; it shows that borderlands are transitional areas between the political units concerned. He argues that frontiers which existed before boundary definition, were usually the result of a zone where there were conflicting claims over territory, or a zone where two cultures were found in cultural competition.

1.2 DIFFERENT APPROACHES TO THE STUDY OF BORDERLANDS

As already mentioned above studies into borderlands are quite a young discipline in geography. As Heller (1993,p.179) noted: " Only since the 1960's the analysis of transboundary movement of population, goods, services and capital became of interest to researchers". And as Martinez (1989,p.397) remarked: "It was historians who continued to

dominate the field of borderland studies until the 1960's".

The borderlands which were previously of most interest to researchers were the European and North-American, which is reflected in the vast amount of literature produced about European transboundary co-operation, the U.S.-Mexican borderlands and the U.S.- Canadian borderlands. With the political changes in Eastern Europe the borderlands there are becoming of greater interest to researchers.

According to Prescott (1987,p.161) geographers are interested in four main topics concerning border landscapes. Firstly, the boundary, its appearance and its function. One example would be the boundary between East and West Germany which by its physical existence showed the state function applied there.

Secondly, geographers are interested in how the boundary influences the landscape of its adjacent borderlands and how this may be explained by the political systems of the adjacent states. Again the boundary between East and West Germany is a good example. On the eastern side big fields dominated the landscape because of the agricultural system, whereas in the west there were smaller fields. Geographers also take interest in the differences of population, infrastructure and economic structures of borderlands.

Thirdly, there is an interest by geographers into how the boundary influences the inhabitants of the borderlands. Finally, they study the influence of the boundary on the decision-making process of the state.

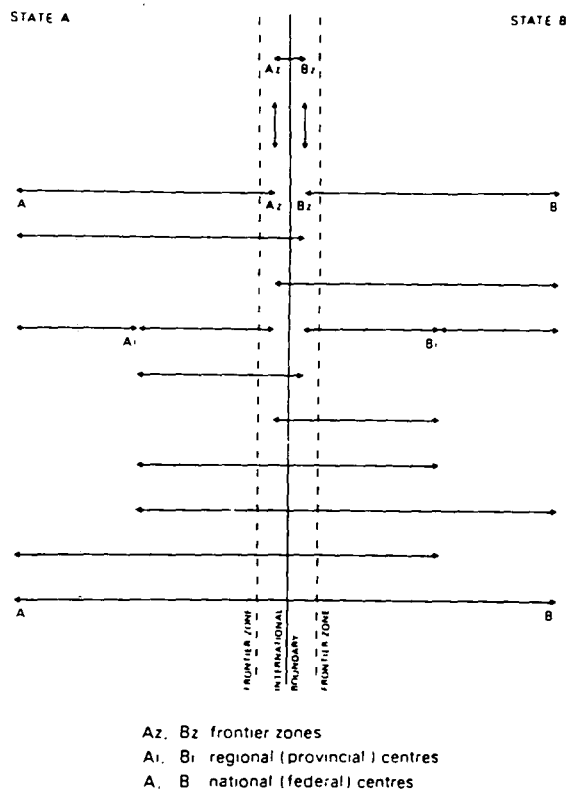
However, despite all the possibilities mentioned above of how to study border landscapes, "in most cases the study of border landscapes was incidental to larger studies dealing with the evolution of the boundary and aimed at

understanding its problems" (Prescott,1987,p.173).

House (1982) in his study of the Rio Grande took a completely different approach. In his operational model (see Fig 1.2) he focused on frontier transactions such as migration, smuggling, retailing and tourism. House (1982,p.7) points out that three new aspects have been developed: setting political geography on a convergent course with other sciences, studying frontiers in their regional context and looking at the positive aspects of co-operation across boundaries rather than the negative aspects of boundaries as a barrier. That this is already happening can be seen by the increasing number of research projects into borderlands concentration on tranboundary co-operation, as well as conferences about transboundary co-operation. Examples of conferences include the International Boundaries Research Unit at Durham on the 'Peaceful Management of Transboundary Resources' (14-17 April 1994), and another held in Basle by the IGU on 'Political Boundaries and Coexistence' (24-27 May 1994). The conference proceedings (Blake,1995; Gallusser,1994) published following the conferences illustrate the great variety of research done by researchers, especially towards peaceful transboundary co-operation.

Adejuyigbe (1989,p.32) also believes that there is the possibility to resolve conflicts in borderland areas. He suggests two ways to study this peaceful interaction: "study the interaction with the core of their respective political units, and secondly study the interaction between the two borderlands on either side of a particular boundary". He also notes that the transitional characteristics of borderlands make them the zones to be most affected by development in adjacent zones: territorially, culturally and economically (1989,p.34). The Alsace is a very good example, where people are bilingual and the house-style on each side is the mirror-image of the other side.

Figure 1.2 The operational model by J.W. House



Source: House, J.W. (1982), p.10.

Ajomo (1989, p.41) made a very important observation, that a solution to boundary disputes will be necessary to reach peace and tranquility which are necessary for the successful administration of borderlands.

Ajomo (1989, p.41) also suggested that transboundary co-operation has to be taken step by step. In the case of Africa he believes it is better to start with bilateral, localised, step by step administrative, economic and social co-operation between territorial communities or authorities across specific frontiers. He also makes it clear that Africa is so far not ready for the type of transboundary co-operation to be found in Europe. It took decades to develop transboundary co-operation in Europe. The Convention on Trans-frontier Co-operation signed by the members of the EC

in 1980, which is used "as a vehicle for trans-frontier co-operation between territorial communities or authorities within the jurisdiction of two or more Contracting Parties" (Ajomo,1989, p.41). He also realises that a similar convention cannot yet be applied in Africa.

Momoh (1989,p.52) poses the question: "if two communities on the opposite sides of a boundary are not culturally, ideologically or ethnically affiliated or homogenous, does it make sense to have a meaningful borderland in that zone ?" He divides borderlands into three zones (see Fig 1.2): minimal, zero, and maximal borderlands. Minimal borderlands display neither cultural nor ethnic affinity. Zero borderlands are where people on the opposite sides of the boundary are diametrically opposed, ideologically and even religiously, creating a zone of friction. Maximal borderlands are where residents have ethnic, cultural, linguistic or even ancestral affinities.

Figure 1.3 Zero, Minimal and maximal borderlands by C.S. Momoh.

Figure 1. Minimal Borderland: No cultural or ethnic affinity between country A and country B. Borderland space is minimal.

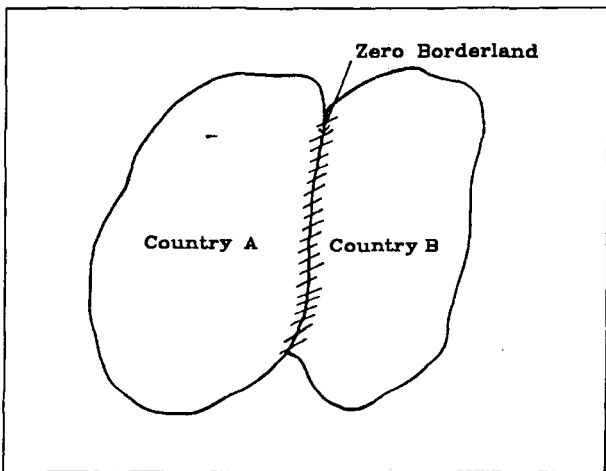


Figure 2. Zero Borderland: Borderland is conterminous with boundary. Country A and country B are ideologically or religiously opposed.

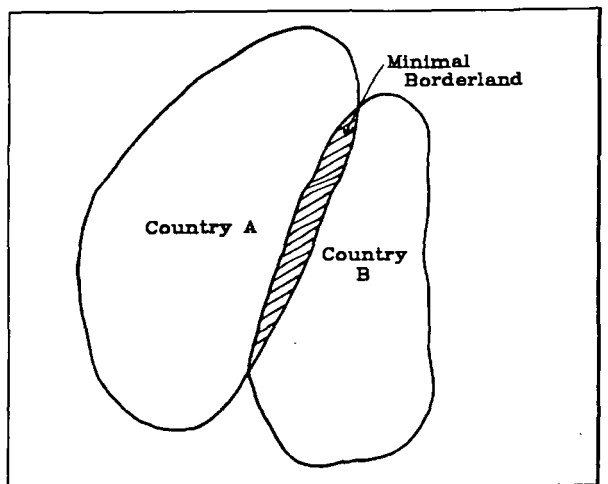
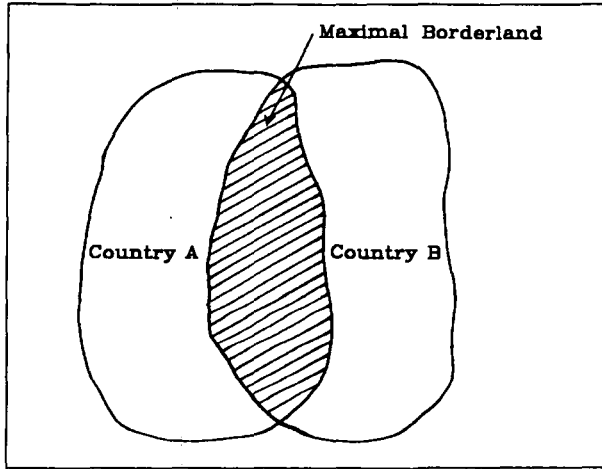


Figure 3. Maximal Borderland: Citizens of both country A and country B have ancestral ethnic and linguistic affinities and links spanning millenia.



Source: Momoh, C.S. (1989), p.54.

Martinez (1994) suggests several model approaches to the study of borderlands. His first approach views the borderlands in terms of interaction and is based on Momoh's approach. He identifies three types of borderlands (see Fig 1.4): alienated, co-existent and interdependent.

Figure 1.4 Approach to border analysis by O.J. Martinez

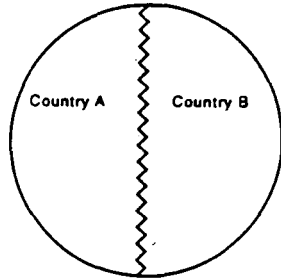


Figure 1.1 Alienated borderlands
Tension prevails. Border is functionally closed, and cross-border interaction is totally or nearly totally absent. Residents of each country act as strangers to each other.

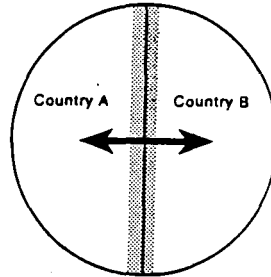


Figure 1.2 Co-existent borderlands
Stability is an on and off proposition. Border remains slightly open, allowing for the development of limited binational interaction. Residents of each country deal with each other as casual acquaintances, but borderlanders develop closer relationships.

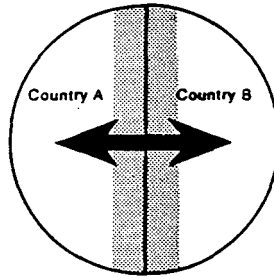
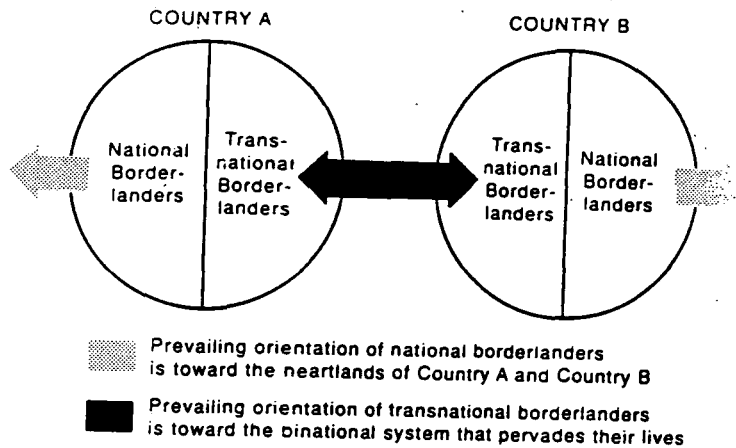


Figure 1.3 Interdependent borderlands
Stability prevails most of the time. Economic and social complementarity prompt increased cross-border interaction, leading to expansion of borderlands. Borderlanders carry on friendly and cooperative relationships.

Martinez also advocates the study of borderland societies, to ascertain the orientation of borderlanders (see Fig 1.5), which could either be orientated to their own country, or to the country across the boundary. According to this he divides cases into national and transnational borderlanders.

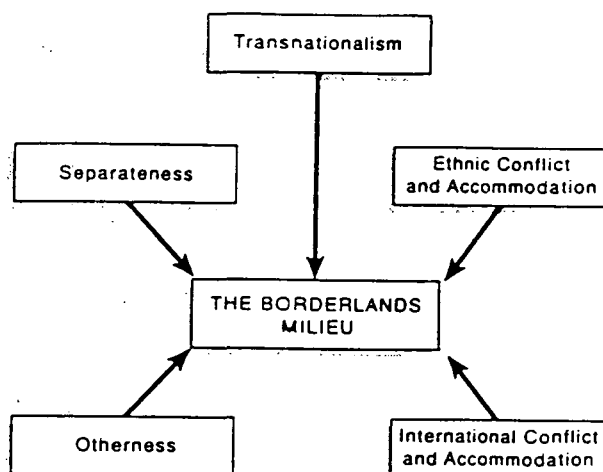
Figure 1.5 National and transnational borderlands by O.J. Martinez



Source: Martinez, O.J. (1994), p. 6.

Finally, he suggests looking at the border milieu, examining the contributors, such as separateness, ethnic conflicts, and international conflict (see Fig 1.6). These factors create a special environment to live in, which distinguish the borderland from the core area of a country and make the border milieu unique compared to the rest of the country.

Figure 1.6 Major contributors to the border milieu O.J. Martinez



Source: Martinez, O.J. (1994), p.8.

Strassoldo (1989, p.389-390) identifies three models of border relations: nation-building, creating a hardening of the boundary; co-existence, where boundaries are undisputed with controlled exchange; and integration where states are willing to devolve their power. He believes that border relations have to go through the stages of nation-building and co-existence before they can reach the ideal stage of integration. Europe only reached integration because, "It was in Western Europe that nation-states were first invented, and it is only natural that this is where they first matured and then decayed" (Strassoldo, p.391).

Strassoldo also recognises that borderlands are usually different from core areas, and have some common characteristics with the adjacent borderlands. There is very often cultural similarity between the two borderlands, both borderlands: are distant from the core, and both of their economies depend on the border policy made by the central government. There is also a similarity of function (e.g. military), economic integration (e.g. cross-border commerce), and physical continuity (e.g. joint infrastructural planning) to be found in adjacent borderlands.

As Strassoldo believes that the needs of the population in the borderlands are very often not fully recognised by the central government, he (1989, p.393) demands that local authorities should be granted some autonomous powers to guarantee the inhabitants of borderlands the right to interact with their neighbours and that their daily lives are not hampered by the boundary. "Relations between border people should be managed so as to maintain a sense of friendliness and common humanity, because borderlands are one of the potentials for, or an actual 'foyer' of trans-national integration, and thus of human solidarity" (Strassoldo,1989,p.393).

Asiwaju illustrates the situation along the Nigerian border (1989,p.67) where local authorities across the Niger-Benin border are like "Siamese twins in every material particular of local geography, culture, language, history, politics and economy;... where inhabitants interact more with one another across the obviously artificial boundary than they do with other groups and sub-groups in other parts of the nation-state". He prefers the Western European model because it is characterized by a gradual but steady evolution from the informal relations at the level of the border communities, to national governments working together in the forum provided by the Council of Europe.

1.3 THE STUDY OF THE BORDERLANDS IN THE ARAVA VALLEY

There have been studies into parts of the border landscapes of the Arava Valley: the boundary between Aqaba and Eilat. Drysdale (1991) looked at the boundary between Aqaba/Eilat as well as other countries in the Gulf of Aqaba/Eilat, in terms of explaining the existing border landscapes by looking at the broader political-geographic environment. Again, this approach takes into account the border landscape.

The possibility of transboundary co-operation in the Arava Valley was seen by scholars in Israel in the 1980's. Yehuda Gradus and others (Ben Gurion University, Beersheba) proposed a joint research project between Israel and Jordan co-ordinated by an American University long before the peace negotiations became public. Furthermore, he had already made concrete suggestions for co-operation projects. Despite the suggestions made by Gradus and others, it still leaves the question of how to assess and evaluate the prospects for co-operation. And do the proposals reflect the reality in the borderlands ?

As illustrated above there are many approaches of how to study borderlands. In the case of the Israeli/Jordanian borderlands in the Arava Valley some approaches simply cannot be applied because of the conditions to be found there. Over the last few decades the boundary in the Arava was a line of division. Interchange between the two borderlands did not exist. Therefore, taking the definition of Martinez (1994) the borderlands in the Arava Valley can be assigned to the class of alienated borderlands where there is no transboundary interchange. Thus House's (1982) study of the Rio Grande, for example, cannot be applied due the lack of interaction, but might be applicable at some time in the future. But how can the prospects for co-operation be studied? The answer to this is simple: There is no model or theory which can be applied.

One major problem which I had to be faced during this study of the borderlands in the Arava Valley was that data was either not available, or in matters related to water resources, it was considered as classified data. Furthermore, population data for the Israeli side was collected for the Arava Valley, whereas on the Jordanian side it was included in the figures of other regions. These problems are not unique to my study. As House in his study about the Rio Grande (1982,p.265) and Martinez (1989,p.389)

have remarked, there is one problem common to all transnational studies: there is a lack of comparable data for the two countries, concerning range and volume of data, as well as the kind of spatial units and the time-intervals for which data is available. The same problems confronted Jones and Wild (1993,p.262) when researching the border between East and West Germany. They remarked that "the quality of the data on the eastern side was inadequate for any comparative cross-frontier study, and the former East German authorities data bases were too narrow in range and too suspect in content for confident analysis".

A more pleasant problem was the political changes in the Middle East, especially the signing of the peace treaty between Israel and Jordan, the events of which threatened to overtake my thesis.

The approach I have taken is to examine the present development of the borderland on each side. Chapter 2 gives a physical overview of the study area and of the boundary itself, with both the population and settlement being discussed.

Chapters 3 to 7 deal with the major subjects of co-operation in the Arava Valley: water, tourism, industry, agriculture, transporation and infrastructure. Each chapter describes the present situation and gives the prospects for future co-operation. Chapter 8 examines other cases of transboundary co-operation, and situations at recently opened boundaries, and how these experiences can be beneficially taken into consideration in the Arava Valley.

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Chapter 2

THE ARAVA VALLEY

The purpose of this chapter is to provide basic background information about the study area, considering topography, climate, soil and vegetation, as well as population and settlements. It also deals with the nature of the Jordanian/Israeli boundary in the Arava Valley, internal administrative boundaries, and the nature of boundary-making in general.

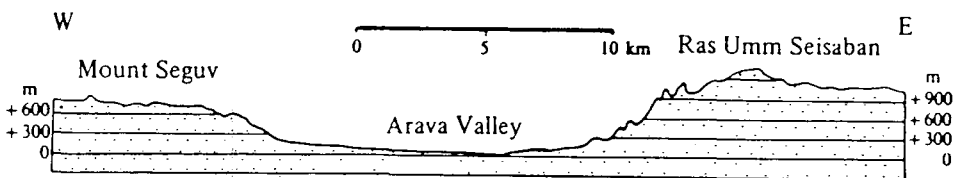
2.1 TOPOGRAPHY

The Arava Valley is only a small part of the giant Syrian-East African Rift Valley. It runs from the south of the Dead Sea to the shores of the Gulf of Aqaba/Eilat (see Fig 2.1). Its formation is a result of tectonic movements over millions of years. In short, the Arava Valley is created by the tearing away of Arabia from Africa, in addition to the uplifting and faulting processes.

Therefore, the Arava Valley shows typical Graben features which can also be found in other regions of the world, such as the Rhine Valley. The Arava Valley is hemmed by rock walls and covered with alluvial and gravel sedimentation. The rock walls to the west, the Negev Hills, rise up to 600 metres, and in the east the Edom Hills are up to 1000 metres high (see Fig 2.2). The alluvial fans at the floor of the Edom Hills and Negev Hills are a result of the flash floods descending into the Arava Valley, carrying vast amounts of detritus. The alluvial fans are much larger and thicker on the east side than on the west because the wadis of the Edom Hills carry more water due to their

higher precipitation (see Fig 2.3). Furthermore, their heights and gradient give the floods greater erosive power. Another effect of the powerful floods on the east side is that the base level of the Arava Valley, which is the stream bed of the Wadi Arava itself, has been pushed westwards (Orni,1971,p.31; Karmon,1971,p.292).

Figure 2.2 East-west section of the Arava Valley



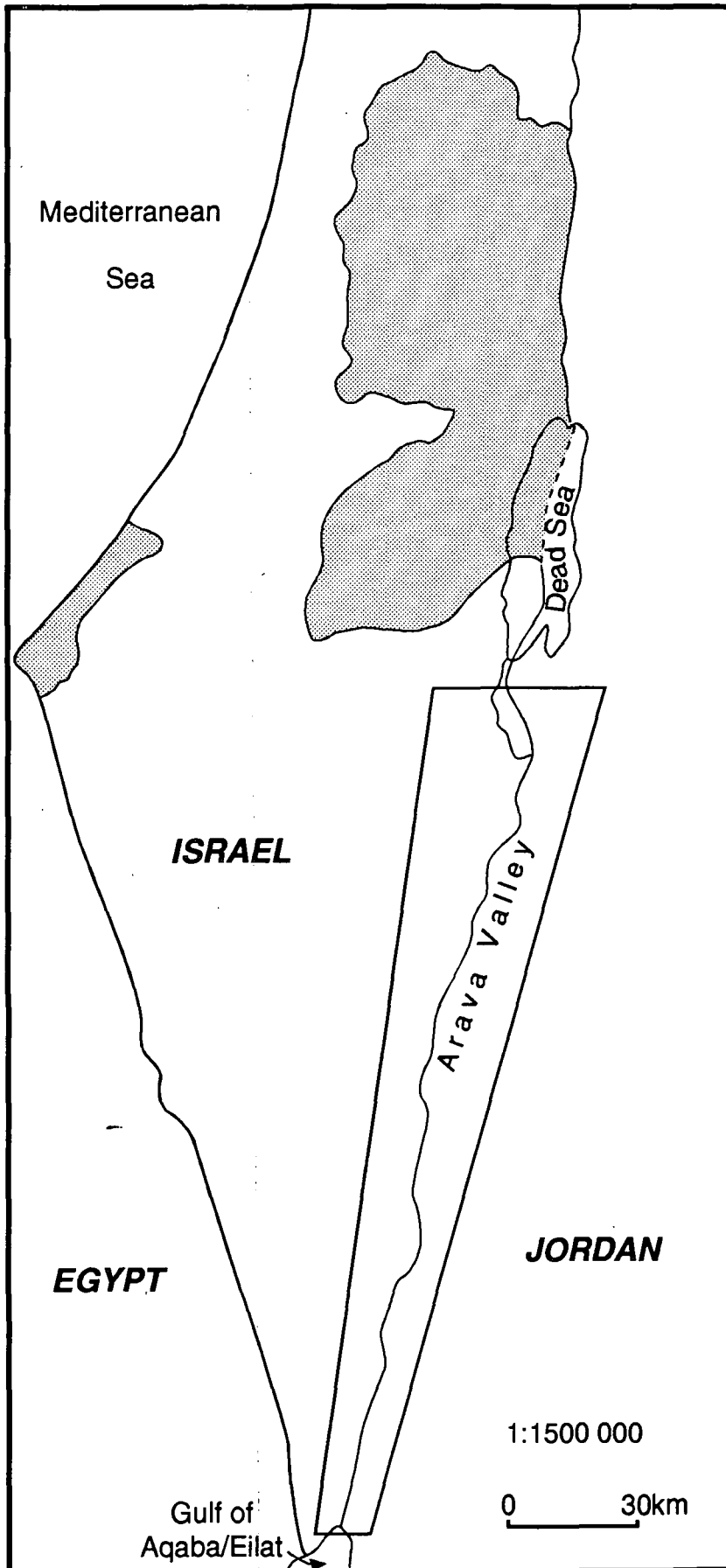
Source: Orni, E. (1971), p.31.

Orni (1971,p.16), Karmon (1971,p.291) and Evenari (1971, p.62) divided the Arava Valley into three natural subregions (see Fig 2.4). Firstly, there is the southern part of the Arava which is 77 km long and 5-15 km wide. The southern Arava is characterized by its short streams which drain into the Red Sea, and do not form a continuous drainage pattern. Most of them penetrate into the subsoil, especially alluvial fans, before reaching the sea. Then in the hot and dry summer the water is drawn up again by capillary action and playas of salt flats are formed on the surface. The southern Arava contains four playas. On the Israeli side there are Eilat, Avrona and the Yotvata Playas; on the Jordanian side there is the Sa'idiyin Playa.

Secondly, there is the central Arava which is 74 km long and up to 32 km wide. The Central Arava is formed by the confluence of Nahal Paran, Nahal Hiyon and other wadis coming from the Negev and Edom Hills. These wadis drain

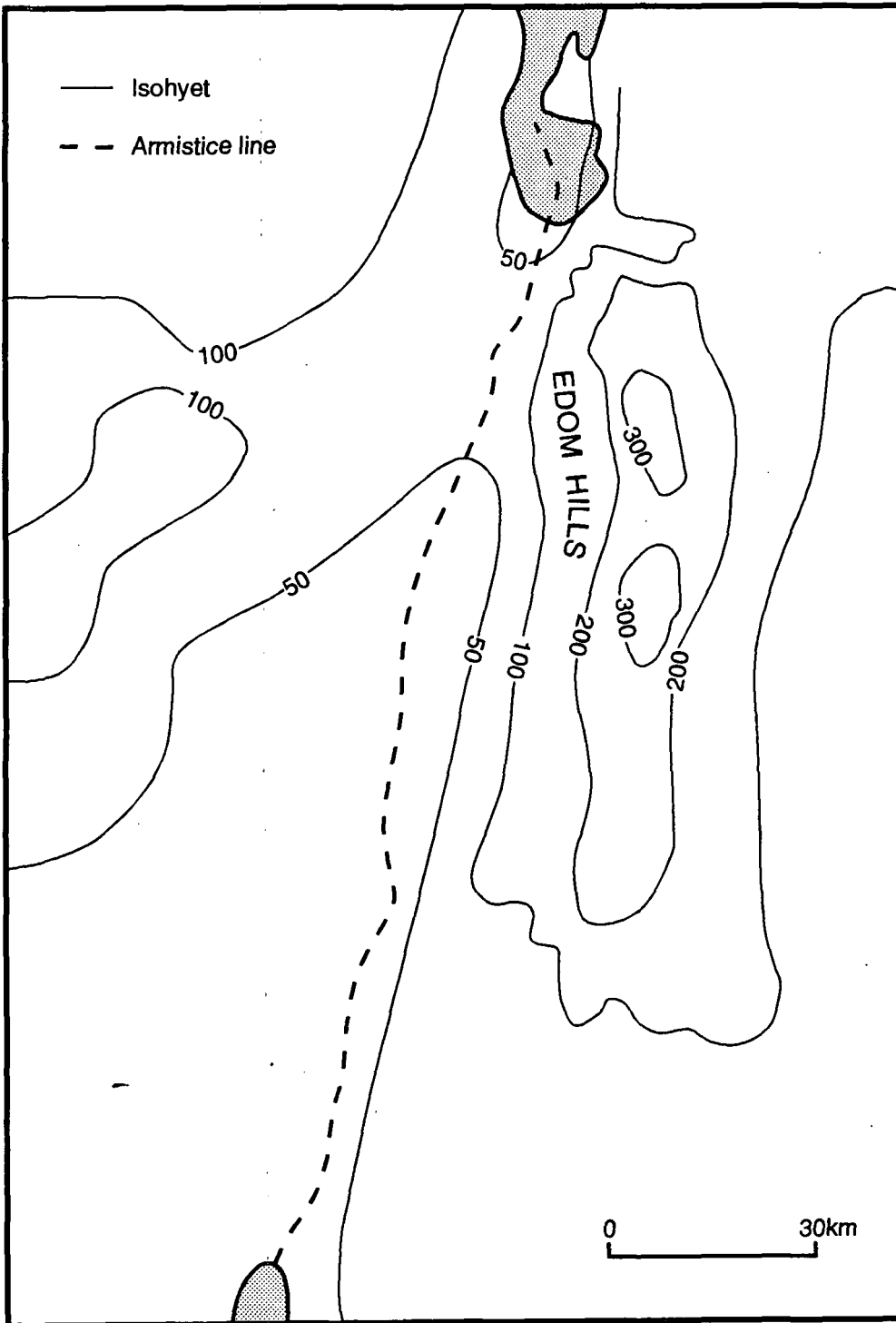
Figure 2.1

Location of the Arava Valley



Source: Own draft.

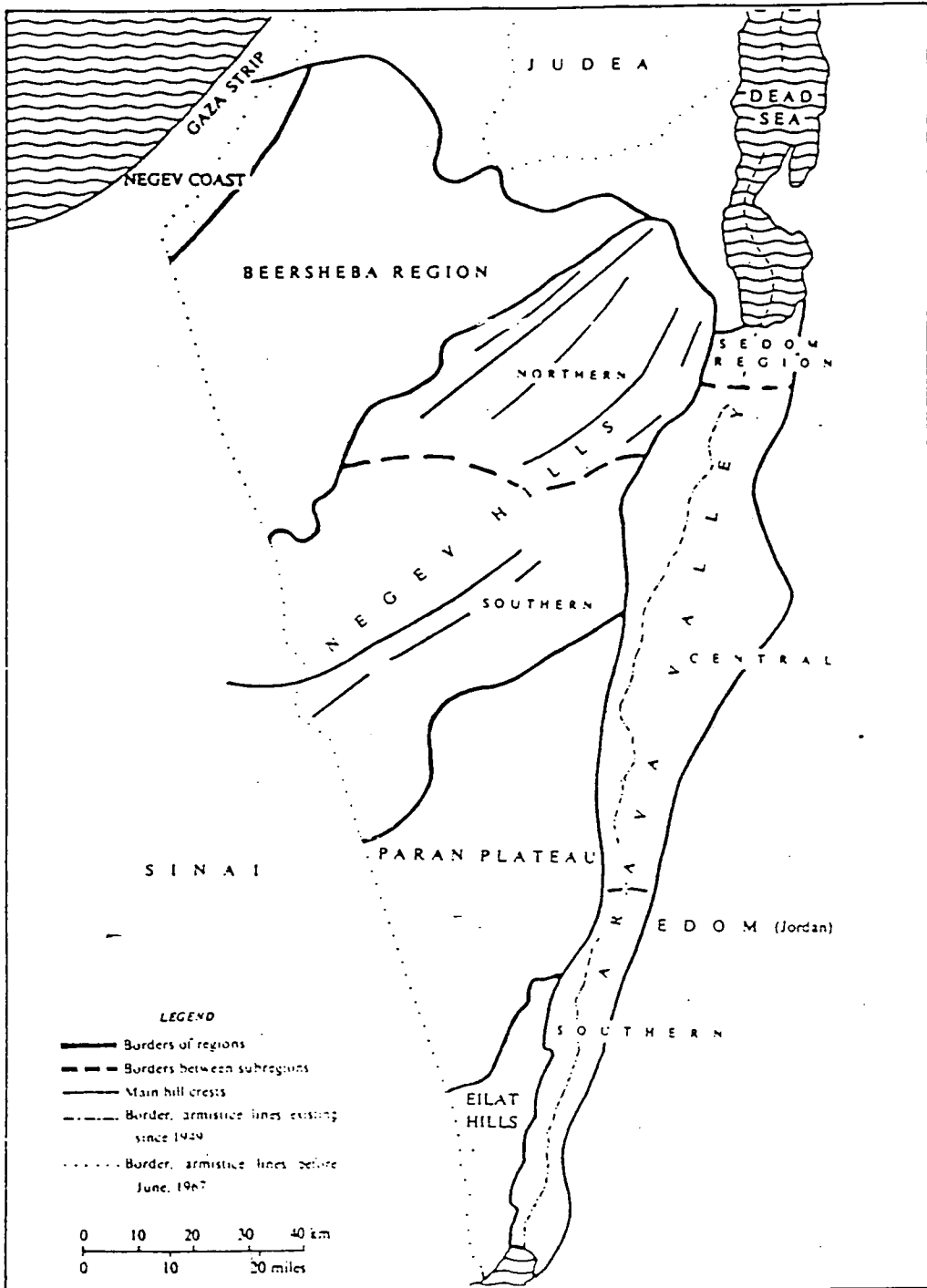
Figure 2.3 Precipitation in the region of the Arava Valley in mm



Source: After Orni, E (1971), p.145.

into to the Dead Sea. The northern part of the Central Arava, unlike the south, is below sea level.

Figure 2.4 Natural division of the Arava Valley



Source: Orni, E. (1971), p.16.

Finally, there is the northern Arava or the so called Sedom salt swamps. Having a length of 14 km, they are frequently flooded by waters rushing down the Wadi Arava towards the Dead Sea.

2.2 CLIMATE

With an average annual rainfall in the Arava Valley of 25-50 mm/year (see Table 2.1), some parts have even less than 8 mm. With high temperatures the Arava clearly belongs to the arid zone. It records a pan evaporation of approximately 3200 mm/year or 8.8 mm/day (see Table 2.1). In August, the hottest month of the year with temperatures of up to 38°C, the evaporation can even be up to 15 mm/day (see Table 2.1). As a result there is very low humidity. Orni (1971, p.150/151) remarked that "the lowest humidity values of the country (Israel) are measured in the Arava Valley where En Yahav... has an annual mean of 40%".

On top of this, in winter there are usually 2 to 3 nights of frost, to emphasise the extreme climate. Wind speeds with an average of 29-30 km/h and peaks up to 76 km/h are nothing unusual.

Data collected on the Jordanian side, the eastern side of the Arava Valley, shows approximately the same temperatures. The temperatures for Ghor Safi coincide more or less with those from Qetura, as well as those from Aqaba Airport being approximately the same as those measured in Eilat (see Fig 2.5). However, rainfall in the north of the Arava Valley (Ghor Safi) is significantly higher than in the south, where there is hardly any rainfall at all (see Fig 2.5).

Table 2.1 Climate data for two sites in the Arava Valley measured between 1987 and 1991

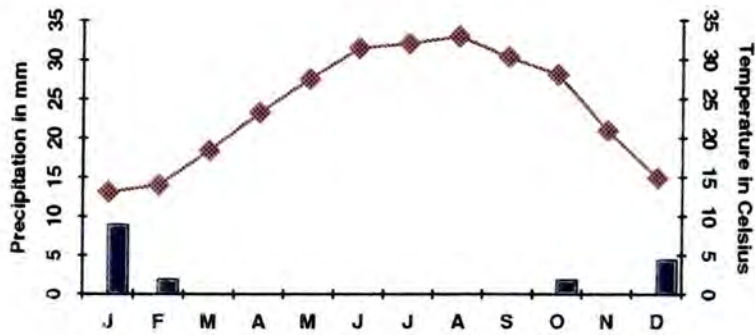
	QETURA	NEOT HAKIKAR
Max/min mean daily temperature (°C)		
August (hottest month)	39/24	39/28
January (coldest month)	18/7	20/12
Annual number of days with the temperature of:		
35°C or more	125-150	126-150
10°C or less	1-25	1-25
Average pan evaporation rate (mm/day):		
Hottest month	15	14
Coldest month	14	5
Annual pan evaporation rate (mm)	3111	3826
Annual rainfall (mm)	55	39

Source: Nerd, A. (1993), p.307.

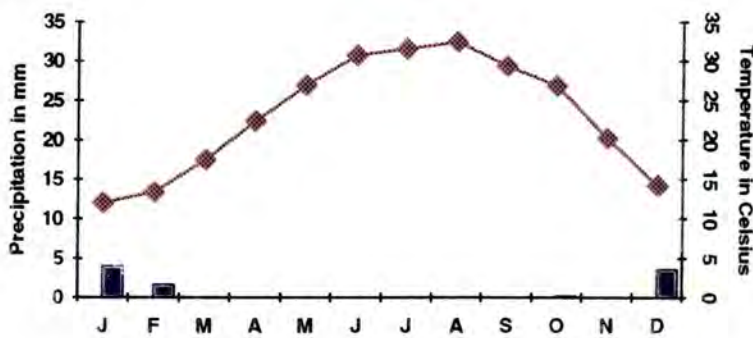
Looking at the Arava Valley, one is clearly faced with low precipitation (ten rain days a year), high variations in temperatures (hot summers and cold winters), low humidity and strong wind. In short, the climate in the Arava Valley is hostile to man.

Figure 2.5 Climate diagram for Eilat, Aqaba & Ghor Safi - 1992

Eilat



Aqaba



Ghor Safi



Source: Own draft.

2.3 SOILS AND VEGETATION

There are four types of soil to be found in the Arava Valley: grumusols and alluvial soils, bare rock and lithosols, hammada soils, and sand dunes (Fig 2.6).

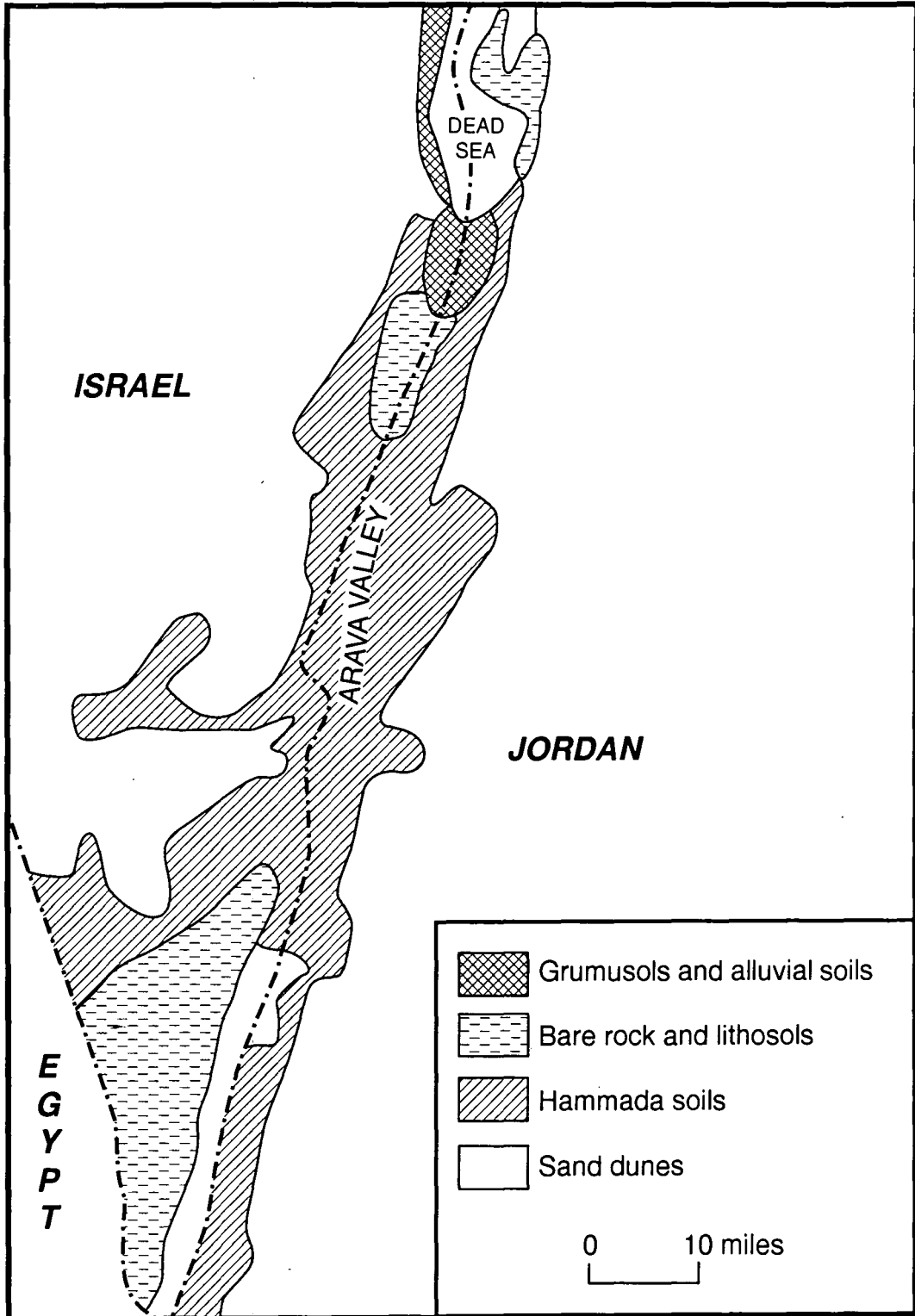
Most of the Arava Valley is covered with Hammada soils (see Fig 2.6). Only to the west and south of the Dead Sea are grumusols and alluvial soils to be found. In the south of the Arava Valley sand dunes cover a significant part of the valley, but mainly on the Israeli side. In the east and south of the Dead Sea bare rock and lithosols are to be found.

According to Orni (1982,p.172) the Arava Valley, except for the salt playas around the Dead Sea and the playas in the south of the Arava, belongs to the Saharo-Arabian Zone. A typical plant for this zone is the Thorny Acacia. This tree may remain bare, dry, seemingly dead for months or years, until a flood rushes down the wadi in spring time. Then the tree comes to life again along with its surroundings which may be covered with flower carpets (see Fig 2.7).

This kind of desert vegetation of bushes with thickened leaves, such as the Thorny Acacia, are to be found in regions with rainfall of less than 200 mm/year and high evaporation. The vegetation is also very sparse due to the limited water available. Mostly, on average there is only one Thorny Acacia per square kilometre, with the trees having to root deeply to survive: for one meter of height an Acacia roots 3 m deep.

Figure 2.6

Soils in the Arava Valley



Source: After Beaumont, P (1988), p.43.

Figure 2.7 Acacia with flower carpet in the Arava Valley



Photograph taken in March 1994

The salt playas in the Arava Valley belong to the halophytic vegetation, with species such as the juncus rush, the Jordan tamarisk and isolated specimens of the 'doom' palm (Orni, 1971, p.174; Zohary, 1981, p.37).

2.4 THE BOUNDARY IN THE ARAVA VALLEY

2.4.1 Boundary-making

Until 1922 no boundary existed in the Arava Valley. Only with the division of British-mandated Palestine in 1921 into Transjordan, which became an emirate east of the Jordan, and Palestine, which stayed under British-mandate until 1948, did it become necessary to fix the boundary between the two territories. In July and August 1922 a confusing correspondence between the Secretary of State for the Colonies and the High Commissioner of Jordan

erupted in order to define the boundary. In a telegraph dated the 15th of August 1922, the Secretary of State suggests that the boundary should be drawn as follows: "South of Dead Sea a line down the centre of Wadi Araba down to Gulf of Akaba should be taken as the Boundary" (Toye, 1989, p. 739). In a telegraph on the 26th of August the Secretary of State asked for a clarification of the line. On the 27th of August the Commissioner defined the line as, "A line commencing from the Gulf of Akaba drawn up through centre of Wady Araba, Dead Sea, River Jordan, Beisan and following the eastern Boundary of the Administrative sub-district of Tiberias defines the boundary" (Toye, 1989, p. 744). The Secretary of State again was not satisfied with this definition because he did not consider it as precise enough. Therefore, he stated that, "An accurate geographical definition is required and wherever possible you should give approximate longitude or mention villages or natural features" (Toye, 1989, p. 745). On the 30th of August the following was agreed: "Trans Jordan comprises territory lying to the east of a line drawn from a point two miles west of the town of Akaba in the Gulf of that name up the centre of the Wadi Araba, Dead Sea and River Jordan to its junction with the River Yarmuk: hence up the centre of that river to the Syrian frontier" (Toye, 1989, p. 745 and 750).

However, this final definition does not clarify whether it is the centre of the Wadi Arava itself, or of the Arava Valley or from where to measure the point two miles west of Aqaba. Because the correspondence was quite confusing, the boundary was always disputed and was never demarcated formally.

Until the peace treaty on October the 26th 1994 it was not clear whether in Northern and Central Arava the actual streambed represented the border, or the middle of the Arava Valley. In the Southern section no clear line could

be identified either. In the past the Jordanians always claimed that the Israelis occupied Jordanian territory both in the north and the south of the Arava Valley. With the signing of the peace it became clear that the Israelis did occupy a vast amount of Jordanian territory in the Arava (Fig 2.9). Altogether the area occupied amounts to 344 square kilometres. Because the Israelis had cultivated land east of the Wadi Arava (Fig 2.8) for some years, the question arose whether they could keep the land or whether it would have to be returned.

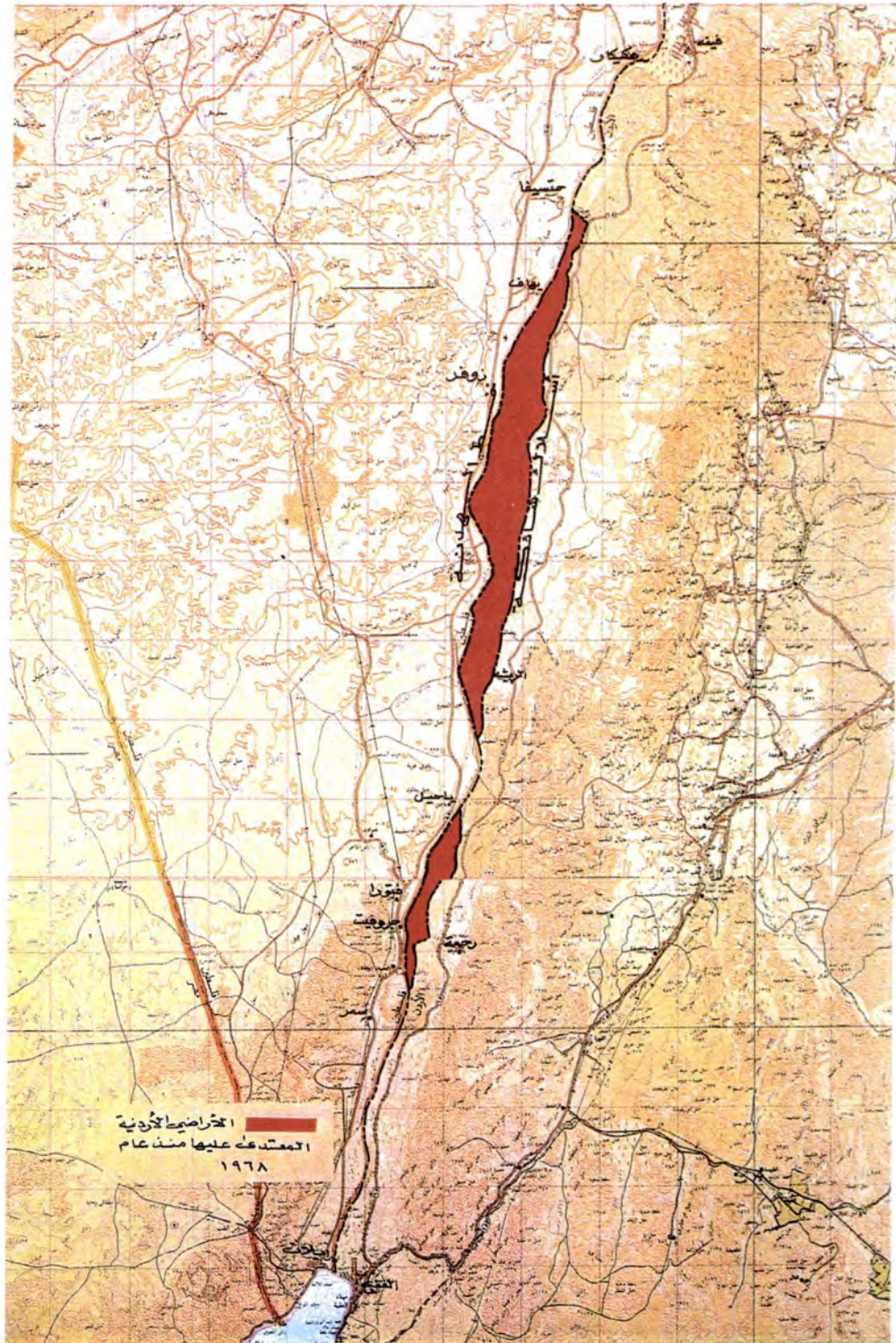
Figure 2.8 View from Jordanian occupied lands in the Zofar region to Israeli territory

(Israeli greenhouses in the foreground are on Jordanian territory, in the middle ground the Wadi Arava, and on the other side of the wadi, in the background, Israeli greenhouses on Israeli territory).



Photograph taken in March 1994

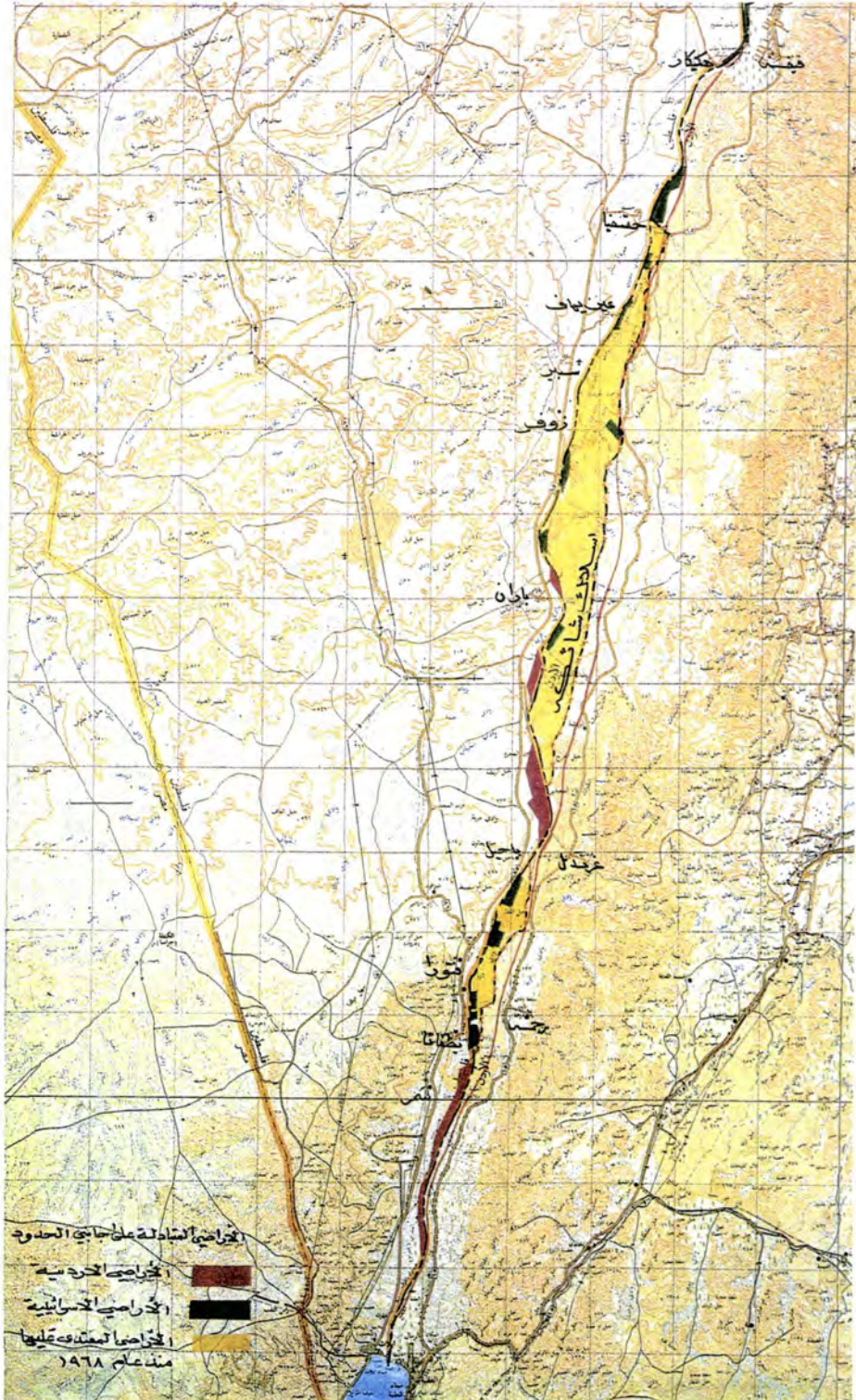
Figure 2.9 Jordanian occupied lands in the Arava before the peace treaty (coloured in red)



However, in the peace treaty it was agreed that the land which was cultivated by Israeli farmers in the Zofar region (Northern Arava) could be still used for up to 25 years, but would be under Jordanian sovereignty (Jordan Media Group, 1994).

The rest of the territory occupied by the Israelis had to be returned, in particular the north of the Arava Valley (see Fig 2.10). In Central Arava, as well as in the south, land has been exchanged. North of Aqaba the boundary keeps its present line, as the boundary line already follows the centre of the valley (see Fig 2.10). To deal with all boundary problems which might occur in the future, as well as for demarcation on the ground, a joint boundary commission was set up.

Figure 2.10 Exchanged land on both sides of the boundary after the peace treaty (red - Jordanian land; green Israeli; yellow - occupied lands)



2.4.2 Nature of the boundary in the past

The nature of a boundary does not change with a treaty neither does its previous function disappear over night. The boundary in the Arava was guarded by both sides and no crossing point between the two countries existed.

However, despite the fact that the boundary in the Arava was sealed for decades, border crossings did occur. After 1968 terrorists tried to cross the border from Jordan to Israel many times. It became a great problem for Israeli security. However, with the help of the Jordanians these incidents were foiled. For example, Jordanians took special care to make sure that swimmers could not cross to Eilat carrying explosives meant for Israeli ships (Garfinkle, 1992, p.78).

More recently Palestinian guerillas swam from Jordan across the Gulf of Aqaba and then shot to death a security guard (New York Times, 31.5.1992). There were also incidents of a more harmless nature, for example when King Hussein's polo pony swam from Aqaba to Eilat and was sent back home (Washington Post, 10.4.1992). However, without the effort by both sides and a certain degree of co-operation these intrusions would have caused great problems.

Instead, these intrusions and even some small border disputes in the Arava were settled by discrete, direct negotiations. Between 1975 and 1976 a minor border demarcation was settled in the Arava area. (Garfinkle, 1990, 92/101).

During my visit to Israel in March/April 1994 rumours occurred that Israel and Jordan had agreed to crossing points at Aqaba and Eilat to allow tourists from third countries to cross from one side to the other. People were quite confident that it was only a matter of time and might even happen in 1994.

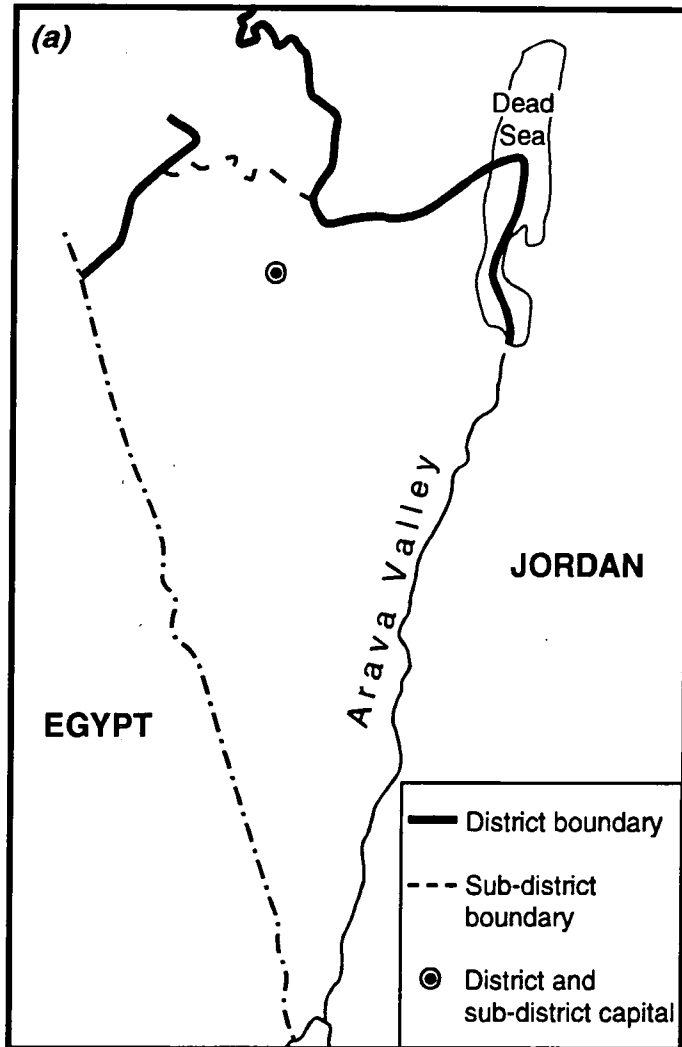
On August the 8th it happened. Crown Prince Hassan and Prime Minister Rabin inaugurated the first border crossing between Jordan and Israel, north of Aqaba (Guardian, 9.8.1994). The crossing was for third-country nationals only.

However, in the peace treaty it was agreed that the crossing points between Jordan and Israel should be opened in both directions for Jordanian, Israelis and third country nationals (Jordan Media Group, 1994). The visa regulations and the opening times of the crossing points were agreed. Other points such as crossing the border with vehicles, have still to be agreed. The boundary in the Arava Valley is now more permeable, but still an obstacle for the free movement of goods and people.

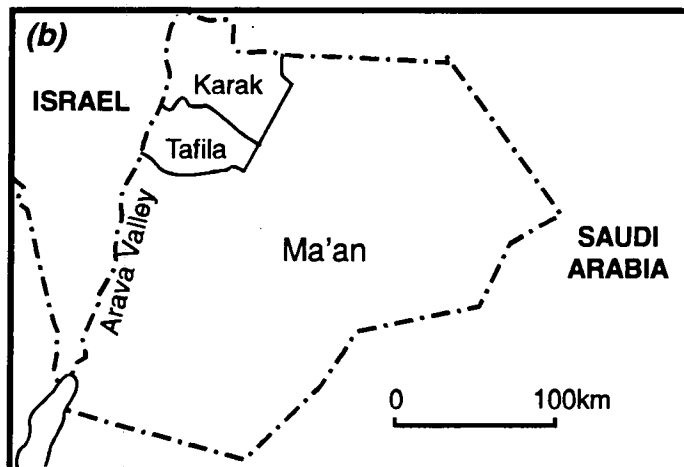
2.4.3 Administrative boundaries in the Arava Valley

The Arava Valley is not only divided by an international boundary, there are also administrative boundaries which do not effect people's movement or the movement of goods, but might affect future transboundary co-operation. The Jordanian side of the Arava Valley is divided between the following three governorates: Karak, Tafiela and Ma'an (see Fig 2.11). On the Israeli side there is only the sub-district of Beer-Sheba (see Fig 2.11) where all the departments responsible for the planning of the Negev have their seat. Apart from these sub-district and governorate boundaries there are many local government units in the Arava Valley on both sides of the boundary. Unfortunately, a map with the administrative boundary lines of the local governments is not available. However, these local administrative boundaries in the Arava Valley are an interesting point to keep in mind when talking about transboundary co-operation.

Figure 2.11 Administrative boundary units in Israel and Jordan



Source: Central Bureau of Statistics (1994).



Source: Federal Statistical Office (1992), p.11.

2.5 POPULATION AND SETTLEMENT

As shown above, the Arava represents a natural geographical unit which until August 1994 was divided by a sealed boundary. Until the 1950's the Arava was largely inhabited by nomads who were shepherders and goatherders. The only permanent settlement in the Valley until this time was Aqaba, which in 1943 was described as " a village, merely a collection of roughly built huts of granite masonry, extending for 800 yards along the shore..." (Naval Intelligence,1943,p.523). In 1954 Aqaba had less than 5000 inhabitants (Harris,1958,p.24).

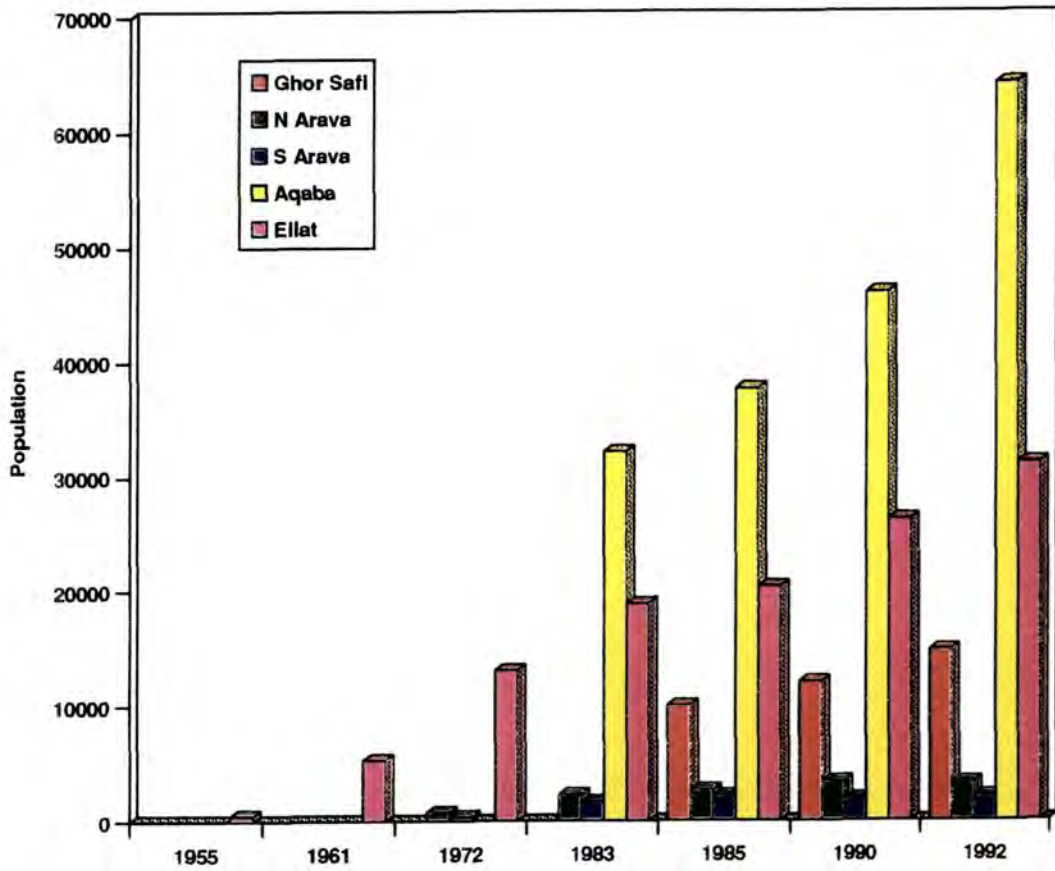
In the following years Aqaba boomed as Jordan's outlet to the sea. In 1992 Aqaba (town and localities) had 64,300 inhabitants (see Fig 2.12), which is expected to increase dramatically over the next decade. "By 2000, Aqaba is projected to have between 140,000 and 180,000 inhabitants completely dwarfing Eilat and all other settlements in the Gulf of Aqaba" (Drysdale,1991,p.201).

Eilat was only founded in 1952. The fact that it has quite an isolated location, Beer-Sheba, the next large town lies more than 200 km away, did not hamper its development. Built as Israel's gateway to the Red Sea and the Indian Ocean it attracted more and more people. Eilat's population increased steadily from 500 in 1955 to 33,000 in 1991 (see Fig 2.12). However, its present population is still only half of that of Aqaba.

The other big settlement in the Arava Valley is Ghor Safi. Safi's population development took off with the establishment of the Arab Potash Works in the 1980's. Since 1985 its population has increased steadily, and Safi has a population of 14,800.

With the foundation of the Israeli State the Western side of the Arava Valley was settled, with Kibbutzim and

Figure 2.12 Population development in the Arava Valley 1955-1992



- (1) data for the Northern and Southern Arava Valley is only for the Israeli side
- (2) data for Safi and Aqaba for 1955-1983 was not available
- (3) data for Northern and Southern Arava for 1955-1961 was not available

Source: Own draft.

Moshavim established. As it can be seen in Fig 2.12 the south and the north of the Arava on the Israeli side had an increase in population in the 1970's and 1980's, but in the 90's there has been stagnation. Altogether the population of the North and South Arava in 1991 was approximately 5,000.

For the Jordanian side there was no population data available about the number of people living in the Arava Valley, apart from Aqaba or Ghor Safi. Khouri (1981,p.218) mentions the number of 793 people who lived in the permanent settlements of the Jordanian side of the Arava Valley. It can be assumed that this number excludes the population of Ghor Safi and Aqaba. However, apart from permanent settlers, bedouins are living in the Arava. According to unofficial sources their number is estimated to be about 8,000 at the present.

One interesting characteristic is that all settlements on the Israeli side are purely Jewish, whereas the ones on the Jordanian side are purely Arabic, excluding Aqaba and Eilat.

In general the population of the Arava Valley increased over the last few decades. Although the Arava Valley cannot be described as densely populated, the two main urban centres of Aqaba and Eilat have a considerable size and their population is increasing steadily. With the peace process and the opening of the border, the resulting opportunities will attract more people. The two towns together could form an urban conurbation in the near future. The boundary between the two towns may even disappear.

As the rural population did not increase significantly over the last ten years, the future here seems to be rather uncertain.

2.6 SUMMARY

The Arava Valley is a natural geographical unit which has been partitioned by a boundary over the last four decades. At this boundary two politically, culturally and religiously different nations meet. Democracy meets monarchy, and Judaism meets Islam.

Despite the political tension along the boundary and despite the Arava's hostile environment, settlements were founded in the Arava and the population increased steadily, especially in the urban towns of Aqaba and Eilat. As the boundary between Jordan and Israel is no longer sealed, the only obstacle left to hinder transboundary co-operation seems to be the administrative boundaries. However, it should be remembered that some of the development in recent decades has been the product of the border and the division of the region between two states.

As the following chapters will show there are other obstacles, rooted in the four decades of differential development. These obstacles cannot just be removed by just opening a border crossing. The obstacles need to be overcome through effective transboundary co-operation.

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Chapter 3

WATER

3.1 INTRODUCTION

The implication of water shortages are difficult to understand for someone living in North-West Europe where rainfall is plentiful. Water is taken for granted in such countries and has never been a long-term factor limiting the socio-economic development.

However, there are countries in the world where rainfall is very low and uneven. Consequently, their water resources are scarce. One such region is the Middle East. Over the the last decade the share of water per capita in the Middle East has been reduced to 1,750 cubic metres, compared to a world average of almost 14,000 cubic metres (Feuilherade, 1994, p.32). Feuilherade believes that the main reasons for this are a growing population and the lack of technology to exploit available resources in many regions experiencing water shortages.

As can be seen from Table 3.1 the water availability per capita has been decreasing steadily in countries such as Egypt, Israel, Jordan and Syria since 1960, and is expected to decrease still further in the next 30 years.

**Table 3.1 Water availability in dry countries, 1960-2025
(renewable resources per capita - cubic (metres))**

	1960	1990	2025
ISRAEL	1,024	467	311
JORDAN	529	224	91
SYRIA	1,196	439	161
EGYPT	2,251	1,112	645

Source: MEED (Special Report Water), 28.1.1994, p.7.

Even Egypt which is one of the most water-rich countries in the Middle East and at one time hoped to export water, had a significant decrease from 1960 to 1990. Looking at the forecast for these countries for the year 2025 the future looks gloomy . Jordan may have less than 100 cubic metres per capita of renewable resources available in the near future and even Egypt may only have 645 cubic metres per capita. Considering Egypt's water situation forecast for 2025 future water exportation by this country now seems out of the question.

There is no doubt that the water shortage in the Middle East is extremely serious. Indeed, remarks such as those by Küffner (1993,p.33) that "the Middle East probably has the most serious water problems in the world", unfortunately, seems to be true.

At this point the question arises of how to resolve the water problem. Two major engineering projects have been suggested. One is the "El-Arish pipeline" from the Nile to

Gaza and the Negev, and the other is the so-called "Turkish peace pipeline". In the case of the "Turkish peace pipeline" it is proposed to transport the water by pipeline, large tanks or even Medusa bags. The project was discussed when the Turkish Prime Minister visited Israel in 1994. Turkey would export approximately 180 million cubic metres of water per year for the price of \$ 0.45 per cubic metre and in return Israel offered its irrigation expertise to assist Turkey in a programme to irrigate southeastern Turkey with water from the Atatürk Dam (Bodgener, 1995, p.11).

The benefits as well as the prospects for achieving such a mega project have been questioned, although they do show good prospects for co-operation. Shuval (1992, p.141) has doubts about success because of difficulties in obtaining agreement of all the countries involved, and also because of Israel's serious concern for being dependent on water resources which can be cut off at any time. Even if, as Wolf (1993b, p.15) mentions, these projects are a possibility to meet the needs in the short-term. Furthermore, there are too many political and practical difficulties involved in realising them.

There has been a trend of moving away from such big projects, this was stressed at the Muscat Water Conference held in Oman in April 1994, which included delegations from Israel. At this conference smaller projects were seen as more favourable, for example, it was suggested to set up a desalination research and technology centre in Muscat. Also, the improvement of waste water treatment, the establishment of a regional water data bank, and a regional water authority were seen as desirable goals. Although these proposals are not yet realised, there does seem to be thoughts about co-operation over water in the Middle East. Hopefully these thoughts are going to be realised; the sooner the better.

3.2 THE WATER SITUATION IN ISRAEL AND JORDAN

Israel and Jordan are both countries with an alarming shortage of water. The water resources in both countries are relatively scarce and uneven due to the dry climate as well as the fluctuating rainfall. The Negev receives less than 250 mm/year, and the southern parts of the Negev even less than this. Only the regions along the Mediterranean coast and the West Bank have a precipitation of 550-700 mm/year and in some parts up to 800 mm/year (Westermann,p.158). In addition there are high levels of evaporation.

In Jordan only the Northwest receives rainfall of 250-500 mm/year. Whereas most regions in Europe have precipitation of more than 750 mm/year and some regions are well above 1000 mm/year or even more than 2000 mm/year in the Alps and parts of Norway (Westermann,p.117).

The natural water scarcity is aggravated by one factor especially: population growth. Although Israel has only an annual growth rate of 1.6 % (see Tabel 3.2) the population is increasing dramatically because of the constant stream of Jewish immigrants. Over the next ten years Israel expects another one million Jews from Russia and the former USSR. This would bring its current 4.80 million population up to a minimum of 6 million by the year 2000 (see Table 3.2).

In Jordan the situation is even worse due to its natural growth rate of 3.5 % a year. Jordan is expected to have 4.91 million inhabitants by the year 2000, and about 10 million by the year 2020 (see Table 3.2).

Undoubtedly, the present water resources are threatened by such a population growth even if, as Kemp (1995,p.8) remarked, the water resources are already well managed through metering and through relatively high water charges.

In short, the present population of Israel and Jordan which is at present 8.4 million, might by the year 2020 reach 18.6 million inhabitants, all of whom need water to survive.

Table 3.2 Future water need in Israel and Jordan (MCM/year)

	GROWTH RATE in %	POPULATION (millions)	WATER NEED - LOW DEMAND (A)	WATER NEED - HIGH DEMAND (A)	LOW/HIGHWA TER DEFICIT (B)
ISRAEL					
1991	1.6	4.80	1800	1800	200/200
2000		6.44	2000	2000	400/400
2020		8.85	2200	2200	600/600
JORDAN					
1991	3.5	3.60	870	980	0/110
2000		4.91	960	1100	90/230
2020		9.76	1300	1600	430/730

(A) Projections assume constant demand for agriculture, growth to come through technology; low demand assumes urban use grows at current per capita usage; high demand allows 100 cubic metres per capita for urban use

(B) Projected deficit equals current annual natural potential minus projected demand.

Source: Wolf, A. (1993a), Natural Resources Journal, p.799.

Not only will the demand for water rise because of the increase in population; another important factor seen by Beaumont (1989, p.20) is the increase in the standard of living in the Middle East.

As shown in Table 3.2 the exploitation of the natural potential of the water resources in Israel and Jordan are already overused, and the future looks very gloomy. Israel has an annual water need of 1,800 millions cubic

metres/year at present, which exceeds its natural potential by 200 millions cubic metres/year. Should the population projection come true, both Israel and Jordan would need more water. By the year 2000 Israel would need 2,000 MCM/year and Jordan a minimum of 1,300 MCM/year. In both cases the demand is far beyond their natural potential.

Even if population growth is the main factor for further decreases of water resources, the main consumer of water in both countries is agriculture. In Israel 71% of the fresh water is used for agriculture (Table 3.3). Industry only uses 4% of total water resources.

The reason for this situation is that agriculture was seen as being strategically important to guarantee the independence of the Israeli state. Therefore, it seems quite natural that water in Israel is managed by the Water Commission which is part of the Ministry of Agriculture. Brooks (1993,p.36/37) stresses water policy is subordinate to an agricultural policy which can be best seen in their pricing policy. In Israel farmers only pay \$ 0.16 per cubic metre whereas domestic users have to pay \$ 0.40 per cubic metre. However, it is a well-known fact that water used for industrial production generates more profit than the same amount of water used to grow Jaffa oranges (Beaumont, 1989, p.104). There is now a growing awareness in Israel of the financial costs and environmental impact of over-exploiting the limited water resources (Blair,1995,p.10). However, Wolf (1993b,p.14) stresses that moving water away from the agricultural sector into the industrial sector would undoubtedly clash with national ideologies.

Table 3.3 Uses of fresh water in Israel (Millions of cubic metres)

Agriculture	1,450 (71%)
Thereof:	
Fresh	1,300
Saline	150
Domestic and Municipal	500 (24%)
Industry	100 (4%)
Thereof:	
Fresh	70
Saline	30
Total	2,050

Source: Brooks, D.B. (1993), p.36.

Braverman (1994, p.34) makes clear that it is necessary to improve the water situation through improved waste water management, but also stresses that this is not a satisfactory solution. He points out that there are only two solutions to guarantee Israel's water need for the next century: "to import water or opt for the massive desalination of sea water."

In Jordan the situation is similar. In 1990 more than two-thirds of the water was used for irrigation. By the year 2000 Jordan's main water consumer is going to be irrigation with 700 MCM/year, followed by the municipal sector with 400 MCM/year (see Table 3.4).

Jordan has intensively developed its agricultural sector. The reason for this, according to Salameh

(1992,p.69), is that the agricultural sector was seen as a medium to create jobs for Jordanians and refugees with relatively inexpensive investment and, therefore, avoid poverty and hunger which could lead to social unrest in the country.

However, as in Israel the limits for agricultural development are being reached in Jordan. Industry wants its share of water. Like in Israel, one option is to take away water from the agricultural sector through reducing the area under irrigation (Kemp,1995,p.8). The other options that Kemp sees for Jordan would be to desalinate water or to import it from other countries.

Table 3.4 Water use for different sectors in Jordan (MCM/year)

Sector	Year				
	1988	1990	1995	2000	2005
Municipal	164	180	255	340	400
Irrigation	535	550	700	720	745
Industrial	34	37	45	60	85
Total	733	767	1,000	1,120	1,230

Source: Al-Mubarak,R. (1993),p.128.

To meet their water demands in future both Israel and Jordan need to cut down their agricultural sector and divert the water into the industrial and domestic sector. Furthermore, all water resources available need to be used and as much as possible must be recycled. Waste water management will become of high importance for dealing with the water shortage. Two key solutions mentioned for Israel and Jordan are desalination and water importation, both of which are mega projects.

3.3 WATER RESOURCES IN THE ARAVA

Although the Arava Valley only receives rainfall of less than 50 mm/year (see chapter 2), occasional floods occur in the Wadi. The peak of water being discharged in such a flood, down the Wadi Arava towards the Dead Sea, could be more than 21 cubic metres per second (Stern, 1986, -Atlas of the Negev, p.73). Such an event might happen less than twice a year but could last more than 26 hours (Stern, 1986, Atlas of the Negev, p.72). These floods are sometimes so strong that the road from Eilat to Jerusalem through the Arava Valley may be impassable for hours or even for a day.

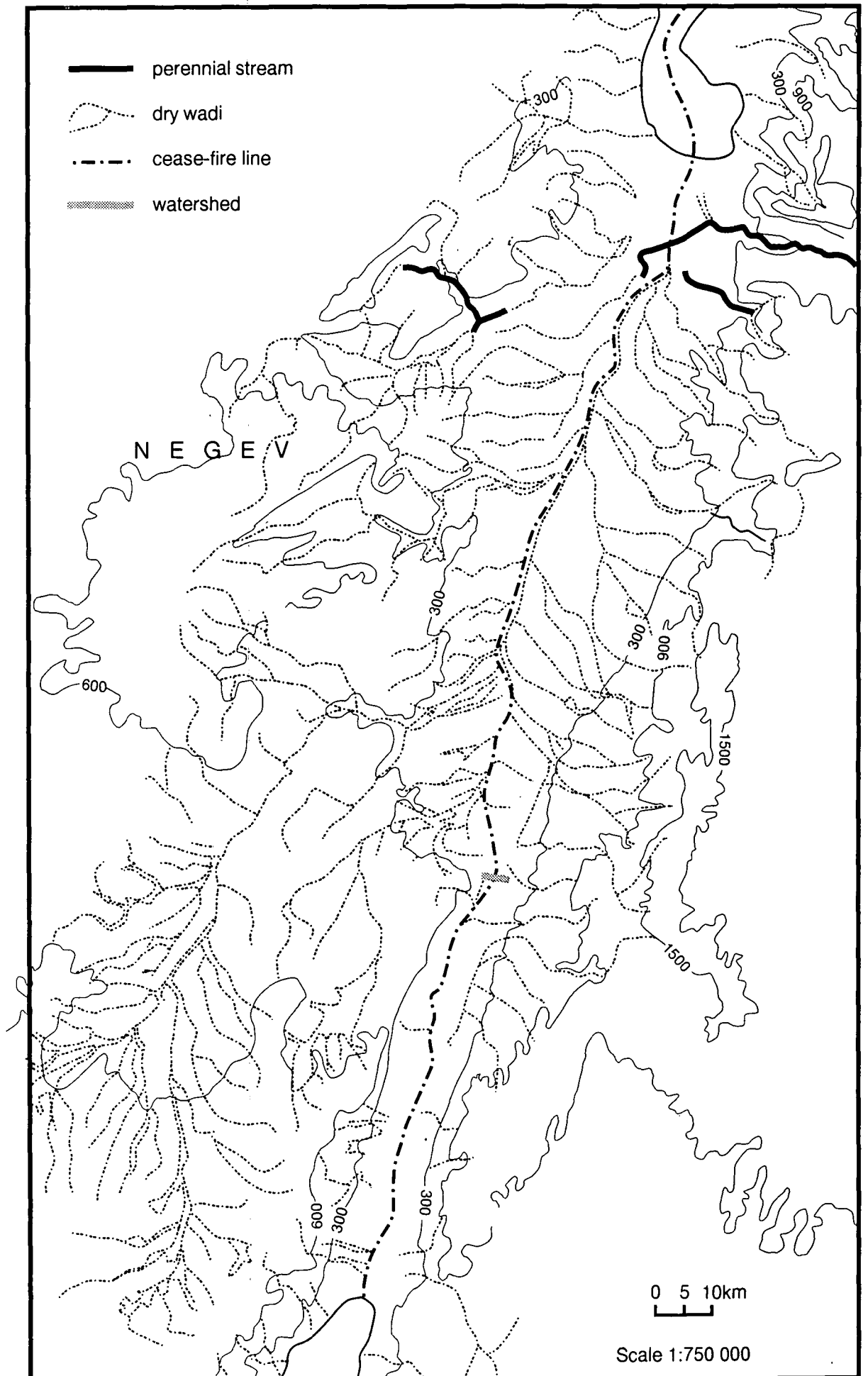
These floods come mainly from the Negev and the Edom Hills. As Figure 3.1 illustrates the water catchment area of the Arava Valley includes nearly the entire Negev and Edom Hills.

However, part of the flood water percolates through the alluvial fans into the groundwater. Then the water flow is divided between the water basin of the Red Sea and the Dead Sea (Tsur, 1992, p.196). The watershed for the surface, as well as the sub-surface water, is approximately near Gharandel (see Figure 3.1). Yet the question of how much groundwater there is available in the Arava has not been answered. Tsur (1992, p.196) claims that an evaluation of the water resources in the Arava Valley is not possible because there is not a proper network of hydrological observation stations. According to a researcher in Sde Boquer, data from the Jordanian side would be necessary as the water catchment area of the Arava Valley extends to the east side as well as to the west (see Figure 3.1).

Investigations done by the Jordanians in 1974 suggests that the groundwater in the north of the Valley is of better quality and higher quantity than that to the south of the Arava. It is assumed that the reasons for this lies in the

Figure 3.1

Water catchment area of the Arava Valley



Source: Own draft.

the higher rainfall in the north and because of the permeability of the bedrock which is also higher in the north. As the rock outcrops in the south are mainly granitic, there is little percolation by surface floodwaters and most is lost by evaporation.

Tsur (1989,p.196/197) identified three water resources in the Arava. Firstly the alluvial aquifers. Secondly, the limestone aquifers which are situated in the northwest of the Arava. Here the water is stored in limestone rocks and forms a semi-fossil aquifer which extends westwards under the Central Negev. Because of its high salinity (4,000-6,000 TDS) this water can only be used for industrial purposes. In this case it is largely used for industrial purposes in the Dead Sea Works. Finally there is the Nubian sandstone aquifer which consists of brackish-fossil water extending from the Sinai through Negev down to the Arava Valley. Its salinity is between 2000 and 4000 TDS.

Unfortunately, data about the extent or the exact location of the aquifers are not readily available and this would require further investigations. However, Tsur (1989, p.197) is of the opinion that the Nubian sandstone aquifer provides the only potential for the agricultural and industrial development of the Arava Valley. Another important area might be the water resources east of the Dead Sea. According to Salameh (1992,p.75) "only 8% of the water resources of the eastern slopes overlooking the Dead Sea are used".

3.4 WATER DISTRIBUTION AND DEMAND IN THE ARAVA VALLEY

Unlike the rest of Israel the Arava Valley is not connected with the National Water Carrier as its remote location would increase construction costs and because it is so thinly populated.

The Jewish and Jordanian settlements in the Arava depend on their local water resources. The water for irrigation is also pumped locally. Present data about the water demand in the Arava Valley was not available for either the Israeli or the Jordanian sides. When asking farmers about the availability of water in the Arava Valley the answer was: "Enough!" Water data are probably amongst the best kept secrets in the Middle East.

However, looking at the water consumed in the Israeli part of the Arava in 1976/77, approximately 50% of the water was used for industry, 40% for agriculture and 10% for domestic use (Survey of Israel, Atlas of Israel, 1985, p.36). According to these figures industry is the main water consumer in the Arava Valley and not, as in the country as a whole, agriculture.

As tourism has increased in Eilat over the last decades it can be assumed that the domestic use is higher than 10%. When asking how much water the tourism industry in Eilat needs, I was several times given the number of 400 cubic metres per room/per year, which includes water for the swimming-pool, cleaning, etc. The amount of water used by one hotel room a year is thus the equivalent of the amount of water which was available in 1990 per capita in Israel (see Table 3.1). Assuming the number of hotel rooms is at present 5000 (see chapter 4) this would be 200,000 cubic metres a year. Compared to Israel's cotton plantations which are very important to the Kibbutzim Industry, and consume some 200 million cubic metre of water per year (Israeli Economist, 1990, p.7) this seems to be negligible. Unfortunately, comparable information about the Jordanian side was not available at all.

Even if the total amount of water used in the Arava is unknown, as well as the amount of water available, water in the Arava Valley seems to be a problem. The brochure for the

Casablanca summit, published by the Government of Israel (1994), remarks that Eilat and Aqaba are both towns suffering from water shortage for domestic use. They further stress that the demand for high quality water will increase with further expansion of the tourist sector. The amount of water available in the Arava seems to be unknown; what is known is that the demand for water will increase in the future.

3.5 PROSPECTS FOR CO-OPERATION

As illustrated above, the Arava Valley presents a hydrogeological unit. The amount of water available in the Arava Valley can only be assessed with data from both sides. Therefore, the answer to whether future demands can be met can only be given jointly by Jordan and Israel. The two countries, whether they want to or not, share the same hydrogeological system in the Arava. With the signing of the peace treaty this fact was officially recognised by both sides. Furthermore, the framework for co-operation over water matters was set down.

In Article 6 of the peace treaty (Jordan Media Group, 1994) the two parties agree to search for ways to alleviate water shortages and to co-operate in the following fields: development of existing and new water resources; increasing the water availability, including through co-operation on a regional basis; minimizing wastage of water resources; prevention of contamination of water resources; mutual assistance in the alleviation of water shortages; transfer of information and joint research and development in water-

related subjects; review of the potentials for enhancement of water resources development and use.

What has been agreed about the Wadi Arava itself so far only concerns the use of wells by the Israelis cultivating land in Jordanian territory. The wells are under Jordanian sovereignty but the Israelis are still allowed to use them for the next 20 years. Israel may increase the abstraction rate from well sand systems in Jordan by up to 10 million cubic metres a year, providing it does not harm existing Jordanian usage.

With the signing of the peace treaty the prospects for water co-operation in the Arava Valley can be described as having a promising future. Projects for co-operation were already brought forward at the Casablanca summit in October 1994. The Israelis proposed several projects concerning the Arava Valley (see Table 3.5). One proposal is to investigate the water resources in the Arava Valley to determine the underground water potential of flood water and its effect on underground water in the Arava Valley. This data would enable the Israelis and Jordanians to utilize the flood water which mostly ends up in the Dead Sea. The estimated cost for this project would be \$100 million.

The Government of Israel proposes to investigate the deep fossil aquifers in the Arava which are underutilised at present because of difficulties with their extraction and their quality. The Government of Israel has proposed the joint regional development of the water resources around the Dead Sea which would cost about \$ 150 million.

Table 3.5 Projects suggested by the Government of Israel for the Arava Valley region and the Middle East

PROJECTS SUGGESTED	Costs 1994 -2004 (\$)
Regional monitoring of hydrological activities (entire Middle East)	
Utilization of flood water along the Arava - joint management and development of the basin	110 million
Utilization of one-time deep aquifers in the Arava	5 million
Joint development of water resources around the Dead Sea	152 million
Pumping effluent for agricultural purposes in the Aqaba area	80 million
Desalination of seawater in Aqaba/Eilat	150 million
Transportation of water between countries - transporting it from Turkey	500 million
Rain enhancement in the Arava Valley	
TOTAL INVESTMENT UNTIL 2004	997 million

Source: Information after Government of Israel (1994).

On top of this agenda is the desalination of seawater which, as yet, does not play an important role for either country's water supply. The reason for this is that the energy needed for desalination is too expensive, making it economically uneconomic. At the moment desalination is only important in the Gulf States where energy is cheap. As desalination takes enormous quantities of energy it is not

surprising that 60% of the world's desalination is located in Saudi Arabia and Kuwait (Brooks,1993,p.37). Yet desalination seems to be becoming more necessary and common place with capacity increasing both in the Middle East and the US over the last decade (see Table 3.6). In the Gulf States 70% of the sweet water is provided by desalination (Feuileharde,1994,p.33).

Table 3.6 The development of world desalination capacity (capacities in 1000's cubic metres per day)

	1968	1977	1985
Middle East	314	1,822	3,785
U.S.A	234	645	1,135
Rest of the world	565	1,241	1,892
TOTAL	1,113	3,708	6,812

Source: Agnew,C. (1992), p.178.

Desalination costs range from \$3 to \$15 per cubic metre of water, but experts hope that improved technology could cut this to between \$1.5 and \$2 (Feuileharde,1994, p.33). Braverman (1994,p.36) even mentions the figure of \$0.70 per cubic meter by the year 2000 and believes that major research and development could reduce the cost even more. This point of view is shared by Agnew (1990,p.184) but he stresses that water from desalination plants would only be for potable supply outside of the oil producing states. Urban and industrial water consumers are more able than farmers to pay a higher price for desalinated water (Beaumont,1985,p.20).

Despite these costs the Israeli Government (1994) believes that desalination is the only possibility for meeting the future water demand of Aqaba and Eilat, with regard to the expected increase in tourism (see chapter 7). El-Sadek (1992,p.162)

takes the same point of view. He remarked that "the strong growth of tourism activities along the coastal areas of the Red Sea and the Gulf of Aqaba, accompanied by improved standards of living of the local population, makes desalting groundwater and seawater necessary to satisfy water needs". The costs for the joint desalination plant are estimated to be \$150 million.

Another project suggested by the Israelis in the Arava Valley is rain enhancement, with an estimated cost of \$10 million. Several rain-enhancement techniques are now successfully practiced in various parts of the world. Furthermore, two mega-projects are under consideration which have been favoured by many people over the last few decades. One is the Mediterranean-Dead Sea project and the other is the Red Sea-Dead Sea canal.

The idea of the Mediterranean-Dead Sea canal goes back to 1902 when Herzl, based on the ideas of the engineer Max Bruckert, saw the possibility of generating electricity by dropping water to the Dead Sea (Harrosh, 1992, p.20). With the peace process the idea received new impetus. The project would need the co-operation of Israel's neighbour Jordan, as it would affect the Dead Sea level and, therefore, Jordan's potash works and evaporation ponds. Harrosh (1992, p.22) sees the Mediterranean-Dead Sea Project as "a touchstone for the relationship and co-operation between the State of Israel and its neighbours". He argues that an integrated desalination plant could provide potable water and provide jobs for thousands of people. It would also enable the Israelis to settle the desert and use the energy and water produced by the canal. Finally, the development of agriculture and tourism in the region could be tremendously extended. However, such a project is seriously questioned by others such as Brooks (1993, p.37) on economic and environmental grounds.

The other canal project suggested is the Red Sea-Dead Sea canal. Fishelson and Glueckstern (1992) suggested it as it "is a true binational project between Israel and Jordan". They believe that the canal would not only raise the level of the Dead Sea, it would also provide desalinated water and electricity.

Feasibility studies for such a canal in the Arava Valley were undertaken by the Jordanians in 1978. The suggested route at that time would have been completely in Jordanian territory. A similar study was undertaken by the Israelis for their side.

The project suggested by Fishelson and Glueckstern (1992) would cross the border and run on the Israeli and Jordanian side, with the optimal route being chosen through transboundary co-operation. However, the most important and promising benefits of the Canal Project seen by Glueckstern (1992,p.12) "is the desalination of sea water on a large scale for the Dead Sea area and southern Arava region".

The Jordanian proposals presented in their brochure for the Casablanca summit are not generally orientated towards transboundary co-operation. However, the Jordanians are clearly interested in transboundary co-operation in water matters. According to an E.I.U report (1995-1996, p.19) "water has been seen as a strong motivation behind Jordan's enthusiasm for the Arab- Israel peace process" as without a settlement in the water matter, Jordan will have growing shortages of potable water. This is because it "lacks the capital for ambitious investment, either in desalination plants or in transporting water to Jordan from rivers beyond its frontiers".

In their brochure for the Casablanca Summit the Jordanians, like the Israelis suggest a Red Sea-Dead Sea canal to keep the Dead Sea level at its present level.

Estimated costs for this project are \$3000 millions.

Furthermore, the Jordanians make clear that they would like to develop the area south of the Dead Sea, the so-called Southern Ghors. At the present this area depends on the base flows of the wadis, in particular the Wadi Hasa, and on the pumping of groundwater. According to the Ministry of Planning (1986,p.138) "no further development is possible in the area, either agricultural, municipal or industrial, without the parallel development of water resources". Therefore, the Government (1994; see Fig 3.7) would like to meet the future water demands of tourism development of the Dead Sea's east coast by 13 MCM/year. Furthermore, they would like to increase the amount of water delivered to Amman by 3 MCM/year and supply the Arab Potash Company with 14.3 million cubic metres a year. Finally, they have already 46,000 dunums of land which requires irrigation, and would like to develop another 21,000 dunums.

Table 3.7 Projects proposed by the Jordanians

Project outline	COSTS in \$
Development of the Water resources south of the Dead Sea for further development	unknown
Increase water delivered to Amman by 3 MCM	unknown
Supply the Arava Potash Company with 14.3 MCM/year	unknown
Meet water demands for present and future irrigation projects in the Arava Valley with 9 MCM/year	23 million
Red Sea-Dead Sea Canal	3000 million

Source: information after Ministry of Planning, 1994.

The second important project mentioned by the Government of Jordan (1994) would be the irrigation of the Wadi Arava which was already mentioned in the Five Year

Figure 3.2 Small dam on the Israeli side to store runoff water so that it can percolate into the groundwater



Photograph taken in March 1994

Furthermore, water quality could also be jointly controlled. Wastewater may not be a problem as yet, but with the increase of industry and tourism it may soon become so. Brooks (1993,p.35) pointed out that "much of the region's (Middle East)water is polluted by industrial and agricultural wastes, and in some cases by human sewage". For example, in the neighbourhood of the Arava Valley, in the Jordan Valley (Jordanian side) the per hectare use of pesticides and fertilizer is the highest in the world. "The water in the King Talal reservoir in Jordan is so heavily loaded with organic material that, in most years, it is unsuitable for agricultural use" (Brooks,1993,p.38). Although industrial contamination of surface and groundwater is not a danger so far in the Arava Valley precautions for the future need to be taken. Therefore, treatment plants for wastewater should be erected along the Arava which should

be planned and used jointly by both sides.

The water network could be connected across the boundary in the Arava Valley, thus integrating regional supply for water in the Arava Valley. Küffern (1993,p.33) raised the idea that the water supply network should be connected across national borders in the Middle East. He gives the example of Lesotho and South Africa where a treaty between the two countries allowed the construction of the Lesotho Highlands Water Transfer despite the fact that there were serious conflicts between them. This would also have the advantage (Küffner,p.33) that an "internationally connected large distribution systems would be less vulnerable to interruptions through hostile actions and natural disaster than large-scale water transfer schemes". Also, additional water could be fed into the network. This would underline the need for joint water quality control, and a redesign of the trunk and distribution lines. An internationally connected distribution system could be started in the Arava Valley which could become a model for the whole Middle East.

The Arava Valley as a region clearly needs its own regional water management. Water demand should be met as far as possible by resources from within the Arava and its region. One possibility to achieve this would be the solar desalination plants on a regional scale suggested by Issar (1982,p.24/25). He thinks of using water whose salinity is just above the threshold where it can be used without treatment for agriculture, by mixing it with distilled water from solar distillations. He believes that the application of solar distillation thus appears promising in the Arava and along the Dead Sea coast where the special climatic conditions are ideal. Issar calculates that such water would have a marginal benefit value of \$1 per cubic meter of water for winter vegetables. One major water source which could be tapped is the large underground aquifers rich with saline

water. So far these are not greatly used, but with proper treatment this source could be used on a vast scale (Issar, 1982, p.33).

The projects mentioned above give an idea of what may be possible in the Arava Region. Apart from the two big projects, desalination plants and Red Sea-Dead-Sea Canal, there are many smaller projects to start transboundary co-operation. However, the basis for everything would be to start a water commission with its seat in Aqaba/Eilat which would be in charge of the common water resources and their planning. Furthermore, a research unit could be established in the Arava Valley with Israeli and Jordanian scientists to explore the resources. Transboundary co-operation over water resources should start in the Arava Valley where the water is located, and with the people whose lives depend on it being involved. It should not be undertaken solely by a government department in Amman.

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Chapter 4

AGRICULTURE

4.1. INTRODUCTION

The conditions for agriculture in the Arava Valley are not optimal. Extreme maximum and minimum temperatures, rainfall of less than 50 mm/year, limited ground-water resources of high salinity and relatively poor soils (see chapters 2 and 3), provide every conceivable obstacle for cultivating land. One might even say that the Arava is hostile to man and his livelihood.

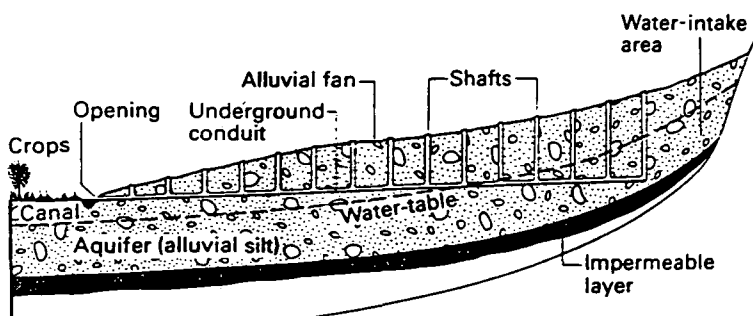
Despite all these obstacles the Arava was cultivated in the past. Remnants of ancient settlements, used by farming societies, extend from the Middle Bronze (2100 -1900 BC) to Roman-Byzantine times (Evenari,1959, p.231).

There are also impressive water and irrigation networks and chain well systems to be found in the Wadi Arava (Khouri,1981,p.21). These chain well systems found on both the West and East sides of the Valley are witness to the agricultural past and to the innovation of man. According to Hillel (1982,p.177), "their importance derives from the fact that the oases they served were situated on the highroad linking the Red Sea port of Elat, via the Negev, with the populated regions to the north and northwest".

Of all the chain well systems in the Negev, those in the Arava Valley, at Yotvata, Ein Evrona and Ein Zureib, are the most intricate in construction (Hillel,1982,p.174; Evenari,1959,p.223).

The chain well system described by Evenari (1959, pp.223ff) belongs to the "Horizontal" type, known as a quanat (see Fig 4.1). These quanats are "long, nearly horizontal underground tunnels designed to tap the groundwater at some higher elevation and lead it to the outlet in the valley" (Hillel, 1982, p.174; see fig 4.1). Quanats are believed to have been invented by the Persians about 3000 years ago (Barrow,1987,p.248).

Figure 4.1 Cross section of quanat



Source: Barrow, C. (1987), p.248.

In the past the Negev had periods when it was not settled. Archaeological evidence suggests that from the 6th to the 3rd century BC, for example, there were no settlements in the region. Only with the start of the Nabatean-Roman-Byzantine time at the end of the 3rd century did the Negev flourish again, with permanent settlements. During the next centuries the settlement of the Negev changed depending on the political situation. When the Negev fell into the hands of the Arabs between 637 and 641 AD, most settlers abandoned their homes. As Evenari wrote, for the next 1300 years the Bedouin became the masters of the Negev (Evenari, 1972, p.27).

With the decline of the ancient cultures the Arava lost all significance. The agricultural past of the Valley fell into oblivion, and over the last centuries the

Arava Valley was only inhabited by bedouins and nomads.

With the foundation of the Israeli State, agricultural developments in the Arava received a new impetus. Travelling through the Arava nowadays green islands in the desert catch the eye of the observer. Agriculture in the Wadi Arava has been revived.

Although the conditions for agriculture are virtually the same on the Israeli and Jordanian sides of the valley, agriculture developed differently on each side. The reasons for this lay in the political and social systems. There are three main variations to be noticed: contrasting stages of agricultural development; the different type of agricultural settlement; and the different products and marketing. The following chapter is designed to elaborate these differences and their implications for future co-operation.

4.2. THE DEVELOPMENT OF AGRICULTURAL SETTLEMENT IN THE ARAVA SINCE THE 1950's

The agricultural development in the Wadi Arava was started by the Israelis in the late 1950's, with the first steps undertaken to establish agricultural settlements. The Jordanians did not make settlement efforts until the beginning of the 1980's.

4.2.1 The case of Israel

The settling of the Arava Valley was initiated for two reasons. The major reason for the Israelis to settle the Arava was geopolitical. The distribution of population and rural settlements along frontiers is seen as being of major national importance to protect Israel's borders and territory. Therefore, the development of the Arava was seen as a barrier against Jordanian expansion, and above all illegal infiltration (Hochman, 1985, p.259; R&D, 1990, p.1). As

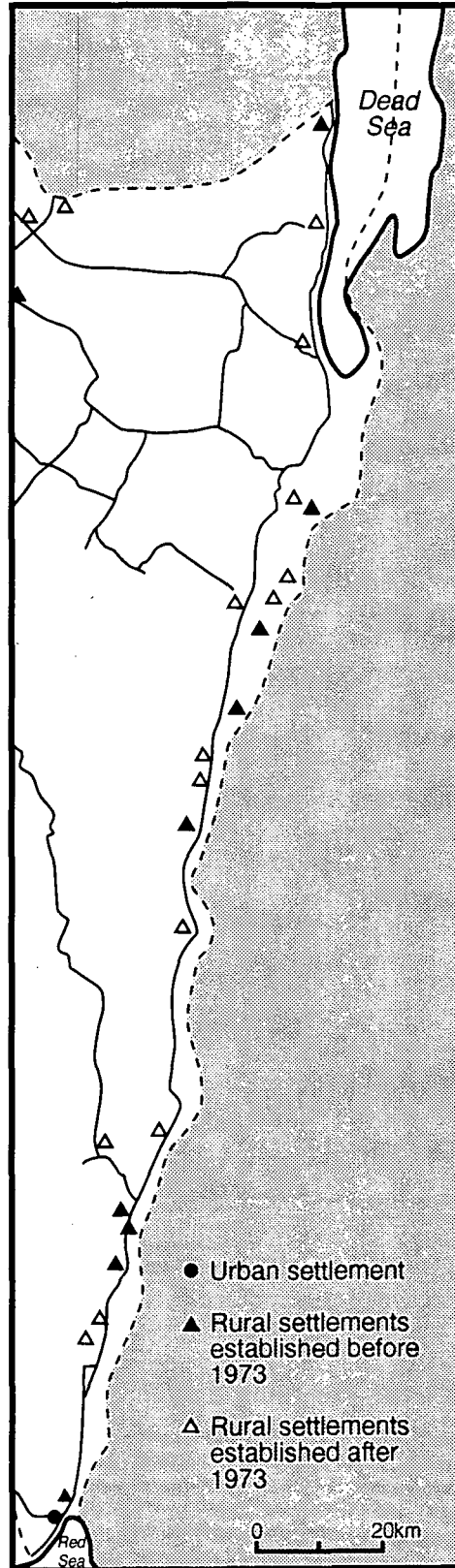
a consequence great effort was put into the development of the Arava Valley. Planners, scientists and farmers worked in co-operation from the very beginning to fulfil this aim (R&D,1990,p.1).

The other reason for settling the Arava lies in the ideology of the foundation of the Israeli state. "Agriculture was the focus of ideological interest in the pre-state period; the goal of recreating a Jewish working class and reclaiming the Land of Israel from the desert both dominated and was manifested in the establishment of kibbutzim" (Rivlin,1992,p.76).

At the start there were only pre-settlements established to control the area. The nature of these settlements were semi-military and therefore farming was only secondary. The first civilian settlement to be founded was in the 1950's, (Stern,1986,Atlas of the Negev,p.18) in the Arava Valley was Kibbutz Elot which started as a fisherman's collective on the shores of the Red Sea. Others were founded the following years such as En Yahav (1959) and Yotvata (1957). After the first successes in producing winter vegetables in the salty soil of En Yahav and Neot Hakkikar, plans were made to establish more settlements in the Arava (Hochman,1985,p.261). Thus in the 1960's several Moshavim and Kibbutzim were established (see Stern, 1986,p.18) such as Hazeva and Gerofit, and more settlements were established after 1973 (see Fig 4.2). The following years proved the possibility of agriculture, and more effort was put into its development. The last thirty years have seen a constant growth of agriculture in the Arava.

Hochman (1985,pp.267ff) identified four stages of

Figure 4.2 Rural settlements in the Arava Valley established before and after 1973



Source: After Dover, S (1985), p.152.

development: firstly the preliminary search when suitable technologies had to be found. It is marked by the establishment of pre-settlements in the 1950's and at the beginning of the 1960's. The second stage from 1969-1973 was a period of consolidation, when Yotvata and En Yahav became settlement centres and drip irrigation was applied successfully. The third period from 1973 to 1979/1980 was a phase of rapid expansion: infrastructure was built and new settlements were established (see Fig 4.2). By this time arid zone agricultural technology had developed far, and was exported to countries such as Morocco and Spain. The last stage mentioned by Hochman is the period of stagnation in the 1980's caused by the increasing competition with other regions and the general agricultural crisis in the 1980's.

In the late 1980's the income of farmers fell because of the fall in international prices of seed products, such as maize and cotton, and as a result of the green revolution in South-east Asia. "Those countries reduced their imports, causing international prices to fall by up to one-third in the late 1980's and early 1990's" (Rivlin,1992,p.78).

Regarding the 1990's, a fifth period could be identified: new innovations and highly developed agro-technology enables the Arava to compete with other regions. Reasons for this and the know-how involved will be discussed later. This stage is an outcome of 30 years effort and innovation of man.

4.2.2 The case of Jordan

The agricultural development on the Jordanian side of the Arava went very differently. In contrast to the attention paid by the Israelis in the Arava, the Jordanian side did rather badly, remaining almost untouched until 1976. For the Jordanians the development of the Jordan River Valley was of greater national importance than the development of the Southern Ghors and the Arava following the 1967 war, as the Jordan Valley provided greater opportunities. The Southern Ghors is the area south of the Dead Sea around the town of Safi.

The declaration of the Arava as a Jordanian military zone and its remote location from the rest of the country did not encourage the development of the isolated area. Also, the hostile environment did not help the establishment of settlements. The inhabitants of the Wadi Arava fell victim to malaria attacks well into the late 1960's, and lacked a paved road until the end of the 1970's (Khouri, 1981, p.216). The Wadi Arava was cut off from the rest of the country, and even nowadays is one of the most remote regions in Jordan. It is still necessary to obtain special permission from the military to visit the area.

In the Southern Ghors, south of the Dead Sea, the situation was slightly different. There, the tomato farmers took advantage of higher rainfall and better conditions to produce the earliest harvest in the country. Whereas "the

nomadic bedouins of Wadi Arava scraped a bare living from the earth by tending to their herds of goats, sheeps and camels" (Khoury,1981,p.216). Only when the Jordan Valley Authority (JVA) started to be interested in the Wadi Arava were the first hydrogeological investigations undertaken in 1977. As a next step small development schemes were set up in Rhama, Arisha and Ummitla at the beginning of the 1980's. These settlements were selected because of their location along the main road from Aqaba to the Dead Sea, their availability of ground water, and their availability of agricultural land. The aim of the settlements is to improve the standard of living of the bedouins in the Wadi Arava. In his socio-economic study of the Wadi Arava Dajani (1979,pp.16ff) described the living as basic and people as being extremely poor; farmers in the Arava Valley belong to the poorest of the country.

Applying the stages of development identified for the Israeli side by Hochman (1985) to the Jordanian side two stages can be identified: in 1976 preliminary research was undertaken, and at the beginning of the 1980's the first attempts were made to establish settlements. The second stage is the consolidation process which the Arava projects are undergoing at the present. Further settlements are planned to be built between now and 1997. At the end of the century 20,000 nomads will be settled in the Arava Valley.

The development of the Arava settlements differs on each side in the following ways, the settlements on the

Israeli side were established for different reasons, while the development on the Jordanian side is twenty years behind the Israeli side.

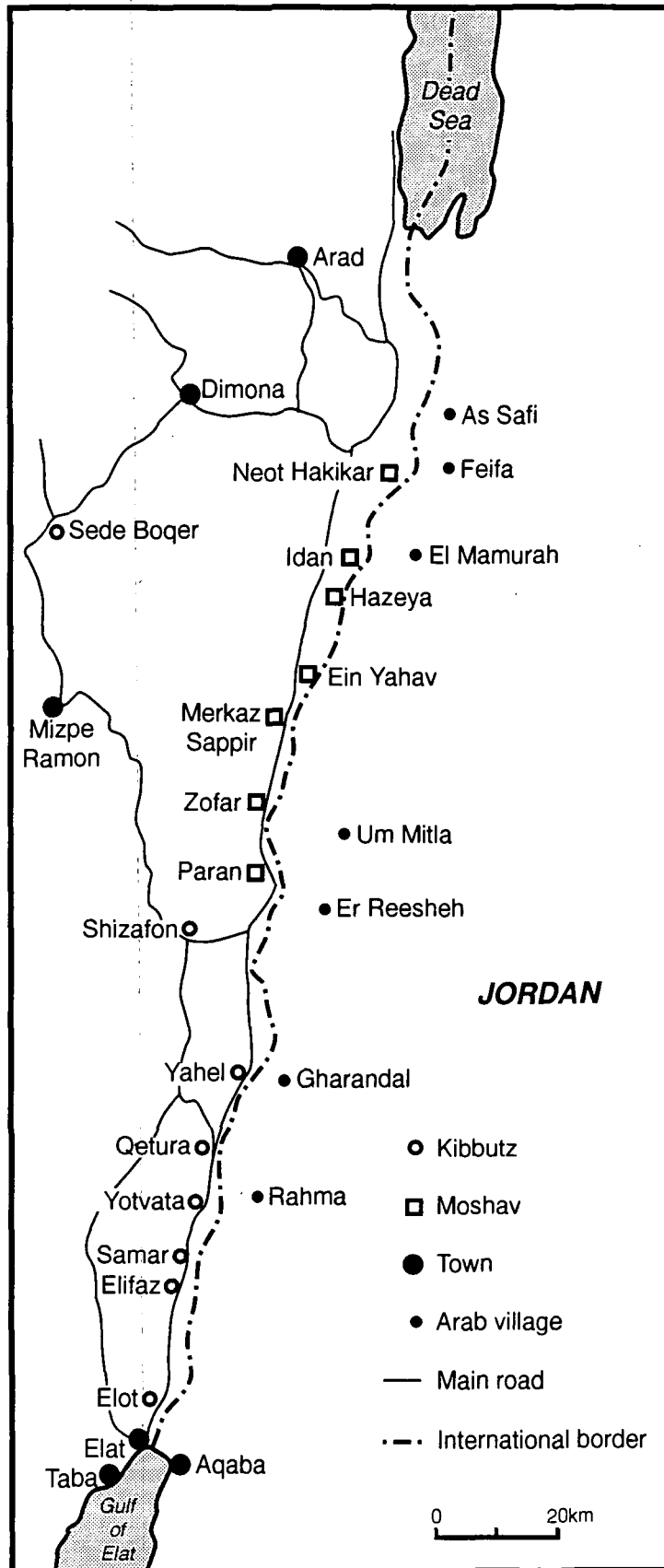
4.3 TYPE OF AGRICULTURAL SETTLEMENT IN THE ARAVA

Israel and Jordan support different types of agricultural settlement in the Arava, which need some comment with regard to future prospects for co-operation. There are three types of settlements to be found in the Arava; two types are found on the Israeli side, the Kibbutz and Moshav. The Kibbutzim are located largely in the south of the Arava and the Moshavim in the north (see Fig 4.3). On the Jordanian side there are the third type, the recently established Arabic settlements.

4.3.1 Kibbutz

Israeli rural settlements such as the Kibbutz are established by the Department of Rural Settlement which is part of the Jewish Agency. "The lands of the kibbutz and the moshav are nationally owned, any sale or alienation being publicly controlled" (Weintraub, 1969, p.283). To obtain public funding and land, these co-operatives are liable to certain rules. One of the most important rules is that, in theory at least, no hired labour is allowed.

Figure 4.3 Distribution of settlements in the Arava Valley



Source: After Hochman, E (1985), p.260.

The ideological background of both Kibbutzim and Moshavim are that agriculture is seen as the essential part of their economy. This, according to Rivlin (1992,p.76) has changed in recent years as more and more Kibbutzim have been industrializing.

The kibbutz is a collective settlement within a democratic framework where the emphasis lies on the social and economic component, so that production and consumption are collective. Also, decisions are taken collectively in an assembly which is the highest authority in a Kibbutz. Managing bodies and office holders are elected from this general assembly. The general assembly is the highest authority on social and municipal issues, issues concerning the village and its residents, investment plans and of all other kinds.

Another interesting aspect is the roots of the establishment of either Kibbutz or Moshav. The initial group of founders of a new co-operative settlement is called the nucleus. In most cases a nucleus is formed by the graduates of a Zionist youth movement in Israel. After the nucleus has been formed, the group joins the army. Whilst doing their military service they will spend time in a Kibbutz to be trained in agriculture and experience Kibbutz life. After military service the nucleus is allocated an area of land on which to pioneer a new settlement.

The founders of Kibbutzim or Moshavim were farmers with a powerful ideological background and these forms of settlement proved to be ideal in difficult and dangerous places, especially along Israel's borders. They were therefore instrumental in settling the Arava Valley in a way no other settlement type could have been.

4.3.2 Moshav

In contrast to the Kibbutz, the Moshav is a co-operative settlement of small-holders. The individual farmer co-operates with other farmers of his/her settlement in most service activities, as well as social and economic aspects, especially marketing. The rules for public funding mentioned above also apply to the Moshav. Moshavim usually adopt the self-labour principal, but this principal is not always applied. Guest workers from Thailand are today seen on the Moshav fields because, compared to Israeli workers, they are much cheaper and are willing to do the hard work on the fields. The workers from Thailand have temporary working permission for about five years. Although there is a high demand by the farmers for more guest workers, the government is not willing to give more work permits because of the high unemployment rate in Israel.

Other characteristics of the Moshav are quite similar to the Kibbutz. There is, for example, a universal voting right in the general meeting and participation in the village institutions is granted to every family member who

lives and works in the Moshav and is older than 18 years. Completely equal rights are formally granted to both men and women, regarding both membership and implied rights and duties.

4.3.3. ARAB SETTLEMENTS

Similar ideological reasons for the establishment of Arab settlements do not exist. The actual initiative to establish settlements came from the Jordan Valley Authority because it saw the necessity to improve living conditions of the bedouin population of the Arava. Therefore, settlements and infrastructure were built, with land distributed to the bedouin. Although most of them do not have a farming background, according to unofficial sources at the Jordanian Ministry of Water and Irrigation, there was a fairly positive response.

Farming is done individually, however share-cropping as it is practiced in the Jordan Valley (Aresvik, 1976, p.257), is also common practice in the Wadi Arava. Share-cropping means that the farmer provides the labour and the landlord the equipment and the land. At the end of the year the landowner receives two-third of the revenue and the farmer one-third. Apparently, 80% of the land in the Safi area is owned by a small number of absent landlords, and the vast majority of the farmers are sharecroppers (Dajani, 1979, p.14). The marketing of the products is done either by the landlord or

his agent. In general, the farmer depends on the land owner and as Dajani (1979,p.16) remarked, they cannot seek alternative services.

The Jordanian agricultural sector is characterised by a low rate of landowner participation, a rise in the ratio of non-resident landlords and an increasing dependency on non-Jordanian labour (Ministry of Planning, 1985,p.535). This, it can be assumed, also applies to the Arava Valley.

On the Jordanian side there is an agricultural system fairly typical of the Arab World, this is in stark contrast to the Israeli side. The type of agricultural settlements in the Arava Valley could not be more different, ideologically and socially they are the complete opposite.

Looking at the prospects for future co-operation, the democratic as well as the ideological component of the Israeli settlements has to be taken into account. The two kinds of settlements on the Israeli side are undoubtedly distinct from the Arab settlements, and direct inter-settlement collaboration in whatever form, may prove very difficult. On the other hand, the necessity for settlement-to-settlement activities is unlikely to be crucial to Arava Valley co-operation.

4.4 AGRICULTURE IN THE ARAVA

Whilst conditons for agriculture are not optimal, Israelis settle in the Arava and live quite well on agriculture. Therefore there must be some advantages which make this type of farming attractive. Amiran (1993, p.109) suggested the main reasons is the Arava's mild climate in winter which enables out-of-season farming. Farmers do not have to compete for land with other potential users such as industry. Another advantage is the remote and isolated location of the Arava which leads to less plant and animal diseases. If these advantages are combined with technical know-how, and great effort is made in undertaking research to solve problems in an arid environment, the Arava can be successfully used for agriculture (Richmond,1985; Schechter, 1985; Amiran,1993).

Richmond (1985,p.170) suggested further research into the selection and improvement of new plant crops that tolerate drought and saline water; new biotechnologies for growing plants and aquatic animals ; expanded utilization of brackish ground water; and the wider use of drip irrigation. Many of the points mentioned above are already pursued on the Israeli side.

4.4.1. Agricultural products

The products to be found in the Arava are drip irrigated with brackish water, because fresh water is not available on either side. The soils used for cultivation in the greenhouses on the Israeli side are partly from sand dunes in the area. This modern intensive agriculture on sand dune soil has been developed in recent years in Israel. As it requires considerable capital investment it is only economically feasible when compensatory crops with a high market value are produced, such as off-season crops that can be exported (Tsoar, 1985, p.195).

A wide range of agricultural products are to be found on the Israeli side of the Arava: paprika, pepper, melons, tomatoes and aubergine (see Fig 4.4) which have all been bred especially for the conditions in the Arava. They are mainly produced for the domestic market and for export to the European Union countries. As the vegetables are grown in the winter season, they have the advantage that they are grown for the out-of-season in Europe.

Other Israeli exports are cut flower and pot plants (see Fig 4.4). There are also fruits such as dates, mangoes and grapes which are again sold for the out-of-season market. Another key feature of the Arava Valley are the dairy farms which are concentrated in the Kibbutzim of the South. Dairy products from Yotvata, which has its own dairy processing plant, are famous throughout Israel (Neffe,

1988, p.115) .

Altogether, an amazing range of agricultural products can be found in the Arava which provide a surprisingly high income. The total income of the Moshavim in the Arava Valley during 1993 was, according to a Moshavim farmer, about \$24 millions.

Hardly any information was available for the Jordanian side about the present products of their farms, but they are thought to include grains, animal feed and vegetables. Apparently, the bedouins only produce for their own personal use and for their livestock.

The situation in Ghor Safi, south of the Dead Sea, is slightly different. There the main product are tomatoes and other vegetables which are sold on the market in Amman or Karak.

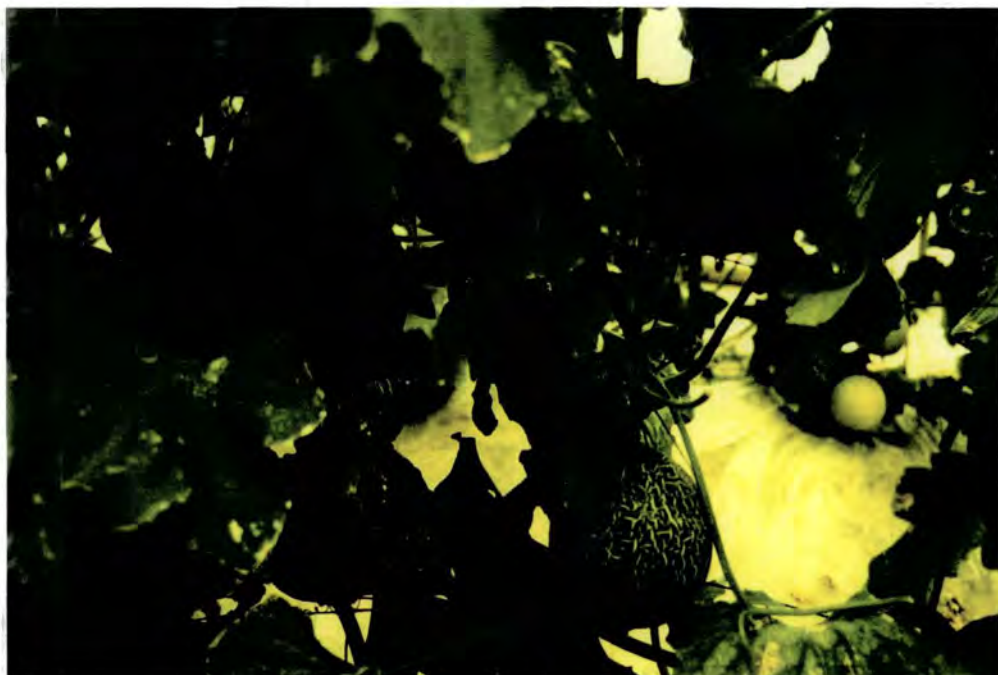
Looking at the Jordanian side the agriculture in the Wadi Arava is negligible. Compared to the wide range of products and export-orientated agriculture on the Israeli side, the Jordanian range is very limited.

Figure 4.4 Agricultural products of the Arava Valley
(Israeli side)



Grapes





Melons



Date plantation

Source: Photographs taken in March 1994

4.4.2 Special products

The special activities and products described in this section are only to be found in Israel.

Fish farming (see Fig 4.5) is a rather remarkable activity for the Arava. Fish need warm water and sun to grow fast, and have been especially bred to cope with high salinity. The Arava Valley with its high radiation, high temperature and availability of geothermal water is well suited to fish culture. Currently there is only one fish farm, in En Yahav, which cultivates a special breed of fish in controlled growth tanks (see fig 4.5). As the equipment is quite expensive and a certain expertise is necessary, the introduction of further fish farms is limited.

Ornamental fish (see fig 4.5) are another interesting fish variety bred for sale. Reasonable investments with relatively little labour can yield high profits. Typically fish are sold for \$1, which makes it a financially attractive business.

Another modern product in the Arava is algae culture in closed systems. Seen in Schechter (1985,p.304) and Richmond (1981,61ff) as a future project, it is now a reality. In 1987 research started to introduce algae into the Arava (Cohen,1987,p.2), initiated by biochemists. Biotechnology is concerned with utilization of biological processes,

Figure 4.5 Fish farming in the Arava Valley (Israeli side)



Tanks with ornamental fish

Source: Photographs taken in March 1994

biological systems or living organism for agricultural and industrial purposes. For example, a yellow pigment used as pro-vitamin A, which is extracted from an algae from the Dead Sea, currently sells for over \$ 1000 per kg (R&D, 1990). Dried and pressed into tablets, they are sold in US-health food shops (Neffe,1988,p.115). Algae can also be utilized in other ways: it can be incorporated as a protein supplement in other food; and can be mixed into animal feed (Schechter,1985,p.304).

4.4.3 MARKETING

The marketing of these products is an important issue. Without proper marketing the best products can remain unsold. On the Jordanian side the products are mainly for the local markets, so marketing seems to be less important. However, authors such as Taquieddin (1986,p.120) realise that to improve Jordan's performance, "farmers should be advised of cropping patterns and production methods which are consistent with an overall marketing policy for domestic and export markets". He suggests that advice should be given on quality standards and optimal timing, especially for the profitable European export markets. Furthermore, new crops and varieties which are in demand in export markets should be introduced.

The Israelis have established a quality and marketing center, and are able to compete in export markets. All the products are channelled through the marketing center, from where they are sent to their final destination. When leaving Israel they have already been sold on the market. All the exports are sent from the Lod airport near Tel-Aviv because the local airport (Eilat) is not suitable for cargo planes. As old market methods are seen as being inefficient, new methods are tested. The Arava marketing center is constantly looking for new markets and new products to improve their market position. To compete with the Mediterranean countries they constantly have to develop new products. However, this seems to be threatened as budgets for research and development are being cut in Israel (Rivlin,1992,p.78). Having mild winters is no longer enough to compete on the world market. Marketing is just another example of how efficient the Israelis are in managing the Arava.

4.5 PROSPECTS FOR FUTURE CO-OPERATION

The Government of Israel (1994) suggested several joint projects concerning agriculture. These include border passes for those involved in farming, with trade networks being established which could supply services to farmers, such as packaging centres for agricultural exports.

Israel and Jordan could also work together on plant protection. According to Garfinkle (1990,p.63) they have already done so, claiming that emergency measures have been co-ordinated in the past in response to plagues of locusts and mosquitos in the Arava Valley.

The Government of Israel (1994) also suggested that the parties could jointly breed livestock and crops adapted to regional conditions. Another important opportunity might be the aquaculture sector, as described earlier on. In the case of the Arava Valley this would be particularly interesting in respect of the revenue which could be expected. At the moment only 100 tons of fish are caught in the Gulf of Aqaba; another 50 tons in Jordan's rivers, while a total of 1650 tons is imported each year by Jordan. There is no doubt that there is a huge potential market for fish bred in water tanks. According to Aresvik (1976,p.209) the demand for fresh, chilled, or frozen fish is expected to increase in Jordan in the coming years. The Israelis suggested a jointly operated R&D Center for marine aquacultural development which could take advantage of an existing agriculture development center for aquaculture in Eilat, which is situated along the Israeli/Jordanian border.

As can be seen, there are many suggestions by the Israelis. However, are they all realistic? In sectors such as plant and livestock breeding, as well as marine agriculture, the Israelis are world leaders. In the past the Israelis exported their agricultural developments indirectly

to Jordan through the West Bank. Are the Jordanians capable of becoming an equal partner for joint developments? According to the Ministry of Planning (1994) the agricultural sector suffers from low levels of marketing efficiency, and inadequacy of activities geared to research in developing agricultural production.

In the short-term I cannot see any realistic prospects for co-operation because the differences in the agricultural organisation, the range of products, and the market orientations are too significant to be overcome without great efforts from both sides. Undoubtedly the Israelis could provide the know-how to improve Jordanian agriculture in the Arava Valley. Theoretically this would be possible, providing the Israelis give their knowledge for free and the pride of the Jordanians would allow them to accept. After talking to officials at the Office for Regional Development in Beer Sheba it is my belief that the Israelis are not too willing to give their knowledge for free; they would rather let the Jordanians pay for it.

However, there are many common problems in the Arava Valley, which could be addressed together. Unfortunately the Israelis have already found the answer to many of them. Because of the high salinity of the water special plants need to be bred. This is constantly done by the Israelis in the Arava Valley and as illustrated above, is very successful (see Fig 4.4). Their production is export-orientated as the production costs in the Arava are high due

to the water and the greenhouses which are expensive to buy. The advanced nature of Israel's agriculture in the Arava is well illustrated by their solution to the problems of their greenhouses. Storms in winter cause damage and because of the high salinity of the water, rust is a problem. This has been solved by developing a new type of greenhouse which is kept up by air, like a ballon. Another type of greenhouse which has been developed is for closed system agriculture (Gale,1981,pp.81ff). Here, solar energy is stored during the day and released at night. The system has several advantages: extremes of temperature during the day and night would be prevented and the cost of energy for heating and cooling would be much reduced, giving optimal growing conditions throughout the year. Furthermore there would be no wind damage to the plants and no sand abrasion, with easy control of pests and disease. These greenhouses are already used on the Israeli side, and are one reason for the success of agriculture in such a harsh environment.

Jordanian and Israeli scientists could work hand in hand to solve the common problems which agriculture faces in the Arava in the future. Furthermore, the Jordanians could use the Israeli marketing system to improve their network. An agricultural school could be established where farmers from both side could be trained jointly. Their mutual problems could be discussed and views exchanged.

To integrate the agriculture of both sides is going to be a great challenge which can only be judged in the long-

term. Co-operation concerning agriculture has to be seen as a small plant which needs great care and time to grow.

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Chapter 5

TRANSPORTATION INFRASTRUCTURE

5.1 INTRODUCTION

Both sides of the Arava Valley are far away from the core areas of their respective countries. The distance from Amman to Aqaba is approximately 280 km as the crow flies, Eilat to Jerusalem is approximately the same distance, and from Eilat to Beer-Sheba it is about 200 km. The area is also thinly populated (see chapter 2). Therefore, the investment per person spent on transportation is high compared to the rest of the country. For example, the road from Eilat to Jerusalem along the Arava Valley needs to be repaired regularly because of the floods. The same applies to the Jordanian side.

However, the population needs a transportation infrastructure for economic activities such as agriculture, tourism and industry. There are many possibilities as to the type of transportation which might be provided. There are airports, ports, roads and railways. The type of infrastructure provided undoubtedly depends on the density of population, economic activity and the money available for investment.

So far there are three types of transportation to be found in the Arava Valley: ports, airports and roads. Because of the political situation both sides developed their transportation network independently. A link between the two networks did not exist.

With the opening of the crossing point between Aqaba and

Eilat on the 8th of August 1994 by the Israeli prime minister, Yitzhak Rabin, and Crown Prince Hassan of Jordan, the first direct link between Israel and Jordan was established. Until then, there was only an indirect link, the Allenby Bridge north of the Dead Sea, which connects Israel through the West Bank with Jordan. But in the Arava Valley itself no road connected the two countries, and no ship crossed from Aqaba to Eilat or vice versa; an east-west connection did not exist at all.

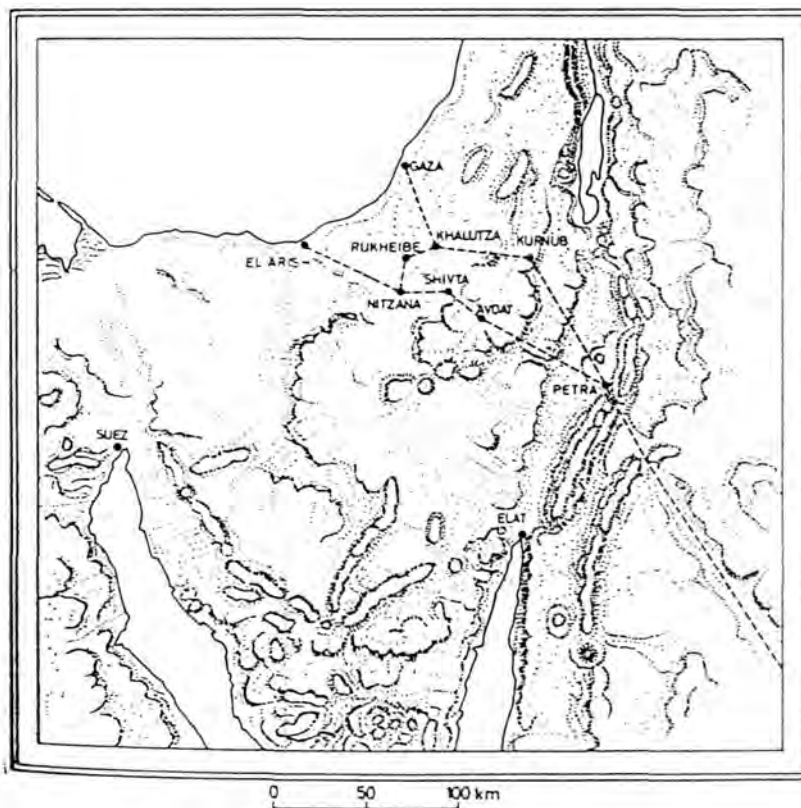
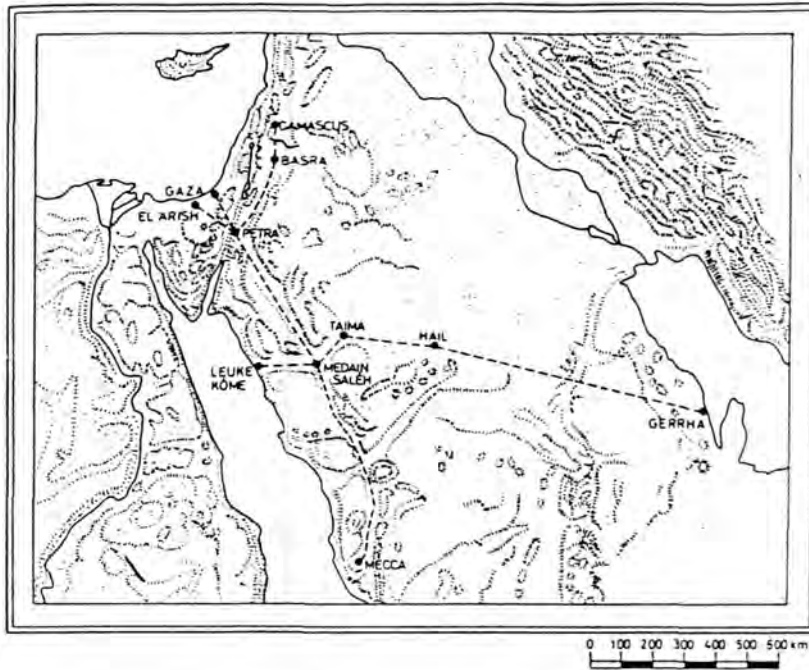
In the past, during a number of historical periods, the Negev desert and the Arava Valley served as a passageway for international traffic. As Gradus (1977,p.29) remarked "the location of Israel on the eastern shores of the Mediterranean Sea, bordering at once the continents of Europe, Asia and Africa, puts it in a geographically unique position." Because of this, the Negev served over and over again as a land bridge.

In ancient times, when Solomon (970-930 BC) developed the copper mines north of Eilat, he also constructed the port of Etzion Geber on the Red Sea, from which he traded with Africa, Arabia and even India (Evenari,1971,p.17). At this time a route from Eilat through the Arava ran to Jerusalem to the center of his kingdom; the city of Eilat was the key port for his kingdom.

Another important time was the flourishing period beginning at the end of the 3rd century BC with the Nabatean Roman-Byzantine era, when the main road from Arabia Felix to Gaza went over Petra and crossed the Arava Valley (fig 5.1). At that time, as today, changing political situations in the region influenced the decision as to which trade route had to be taken. With the rise of the Romans in the region the caravan highways declined because the Romans developed a new trade route in order to weaken the Nabateans (Evenari, 1971,p.21). Goods were then transported to the Egyptian

coast, from there by land to the Nile, and then by boat to Alexandria.

Figure 5.1 The Nabatean trade routes



Source: Evenari, M. (1971), p.19.



From Alexandria the goods could take their final destination to Rome.

Eilat became important again when the land-route to the Far East was closed because of continuous war with the Persians (260-240 AD) . During the Byzantine period (3rd-6th centuries) Eilat once again functioned as a gateway to East Africa and the Far East, but fell into disuse from the period of the Crusades (11th century) until recent times.

As can be seen, the importance of the Arava Valley as part of the east-west trade route strongly depended on the political situation in the region; its fortunes changed from one century to the next.

With the peace process in the Middle East the role of the Arava and its transportation infrastructure might again play an important role in linking east and west. Instead of camels, lorries might in future cross the Arava Valley from east to west and vice-versa.

Looking at the transportation infrastructure of the Arava Valley today, one side of the Arava seems to be a mirror image of the other. Roads run parallel to the border on each side and there are airports in Eilat and Aqaba only a few kilometres away from each other. However, 46 years of independent development marked the transportation infrastructure on each side, which have been designed for local and national needs, and their integration into an international system will be a difficult task.

5.2 ROAD TRANSPORTATION IN THE ARAVA

As described in chapter 2 until the 1950's the Arava Valley was only inhabited by bedouins. There were no

permanent settlements, except Aqaba. Therefore, roads did not seem to be necessary. The roads existing until the 1950's ran along the Arava Valley in a north-south direction and there were also some east-west connections. The roads were all unpaved and could only be used with desert vehicles.

The establishment of the boundary between Israel and Jordan has put many roads out of use and new roads had to be build to replace them (Orni,1971,p.353), especially in the north. In the Arava itself only the road running along the coast from Aqaba to Eilat and the few desert tracks were put out of use.

With the development of settlements and increasing economic activity over the last forty years, it became necessary to build the appropriate transportation infrastructure for goods and people. Today there are sufficient roads on both sides.

5.2.1 The Jordanian side

The Jordanian side of the Arava Valley lacked a paved road until the late 1960's (Khouri,1981,p.216). The reason for this was, undoubtedly, that there was no economic activity on the Jordanian side until then. As only bedouins lived there the cost of building a motorway would not have been justified. Only when the Arab Potash Company decided to open a factory in Safi did a highway need to be built to guarantee the transport facilities for the exports of Potash through Aqaba. So in 1977 a two-lane paved motorway linking Safi with Aqaba was built; the Potash Plant started operation in 1982/1983. Today the route is mainly used by the Potash company, the military and occasionally by a few tourists travelling through the Arava to the Dead Sea or from the Dead Sea to Aqaba.

The main traffic junction is Aqaba where all the Jordanian routes end. It is the terminus of the Iraqi-Aqaba highway and the road from Safi. The number of cars and trucks going to and from Aqaba Port (see Table 5.1), is causing severe congestion problems.

Table 5.1 Total number of trucks per year to and from Aqaba port, 1985-1991

No. of trucks in thousands	1985	1986	1987	1988	1989	1990	1991
To the port (1)	185	200	270	242	181	174	130
From the port	219	222	248	236	208	188	172
Total	405	423	519	477	389	362	302

(1) including phosphate to the fertilizer plant.

Source: Delegation of the Commission of the European Community (1993), p.3/13.

Until the embargo against Iraq, most of Iraqi goods during the war with Iran were transported by a joint Jordanian-Iraqi Company from Aqaba Port. Only with the embargo against Iraq in 1989 did the number of trucks through Aqaba decrease significantly. During the Iran-Iraq war the Israelis apparently once complained about the clouds of dust that the trucks were causing. In 1991 only 302,000 trucks, compared to 477,000 in 1988, went to Aqaba port. Even with this smaller number of trucks passing through the small coastal corridor the pollution from the traffic, especially from exhaust gases, is still significant.

The traffic pollution in Aqaba because of heavy traffic led to the construction of a backroad a few years ago

This backroad has already been damaged by the heavy trucks using the road, and the floods descending from the surrounding mountains.

Because of its industry and the fact that Aqaba port is the only outlet that Jordan has to the sea, Aqaba has to handle heavy traffic. As the coastal strip is very narrow, there is only very limited space available for building new roads or to use alternative routes (see Fig 5.2). The backroad had to be carved into the rock of the surrounding mountains. The road from Aqaba to Saudi Arabia has to run along the coast parallel to the beach (see Fig 5.3), hemmed to the west by the sea and to the east by the mountains (see Fig 5.2).

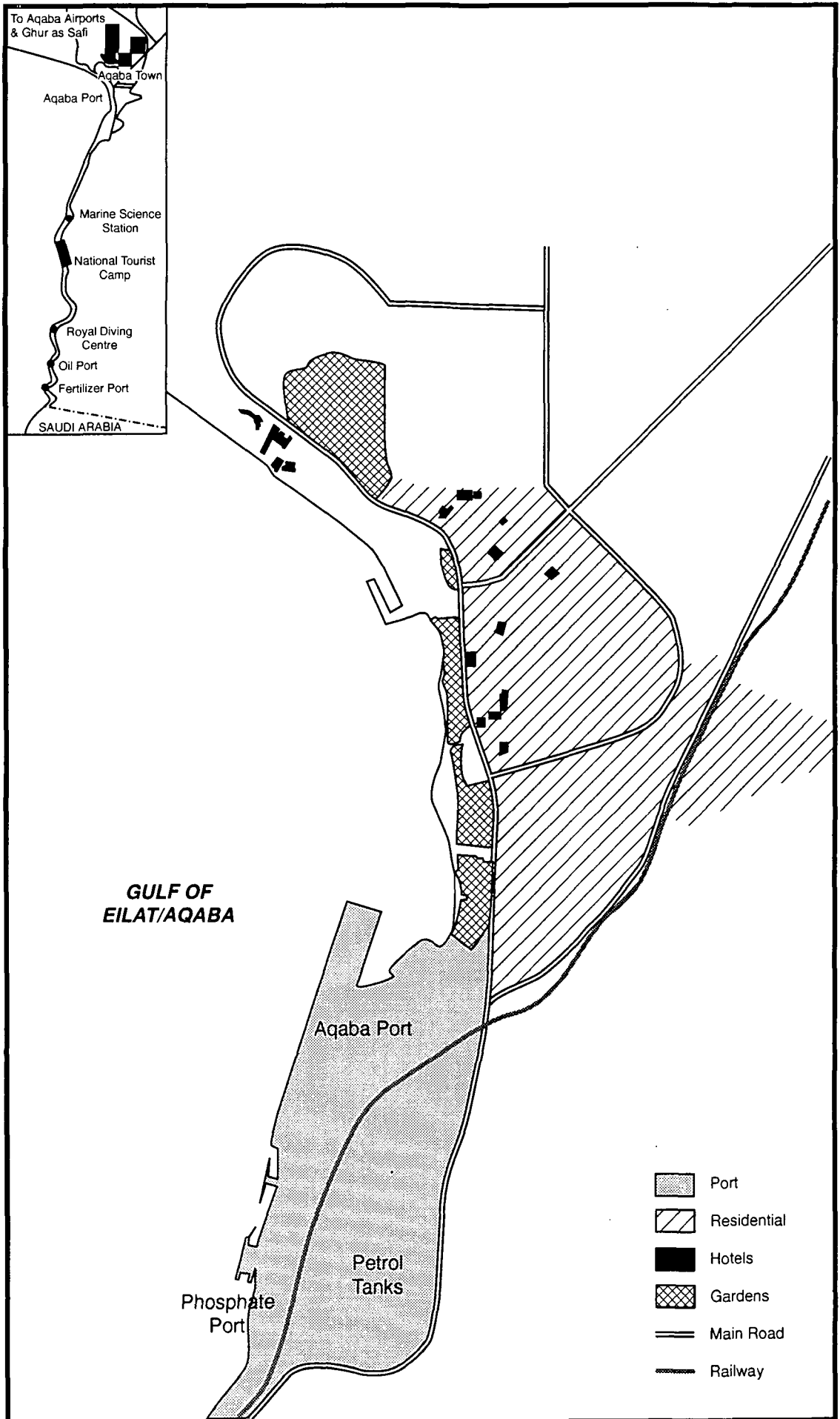
Figure 5.2 Aqaba and its costal strip



Photograph taken in March 1994

Figure 5.3

Spatial distribution of the infrastructure in Aqaba



Source: Own draft.

5.2.2 The Israeli side

On the Israeli side the development of the transportation infrastructure has been mainly influenced by political rather than economic factors. The roads in the Arava Valley were built for national security reasons and to enable the establishment of the settlements (see chapter 4). The southern half of the Eilat-Jerusalem road in the Arava Valley was built between 1948-1957 (Stern, 1985, Atlas of the Negev) because the first Kibbutzim were built in the south. In the period 1958-1974 the road to Timna, the northern half of the road in the Arava Valley and the roads along the Dead Sea were built. The roads along the Dead Sea were built to serve the Potash Company. Today the road along the Arava serves as a corridor to the Dead Sea and Jerusalem, and for the Potash Company to transport its products to the port of Eilat.

Eilat is, like Aqaba, a traffic junction. The roads from Beer-Sheba and Jerusalem end there, and all the traffic to the port which is situated south of the town, has to go through it (see Fig 5.4). According to Feitelson (1991, p.362) the traffic to the port causes considerable safety problems because the road severs the city from the north shore resort area and the beach.

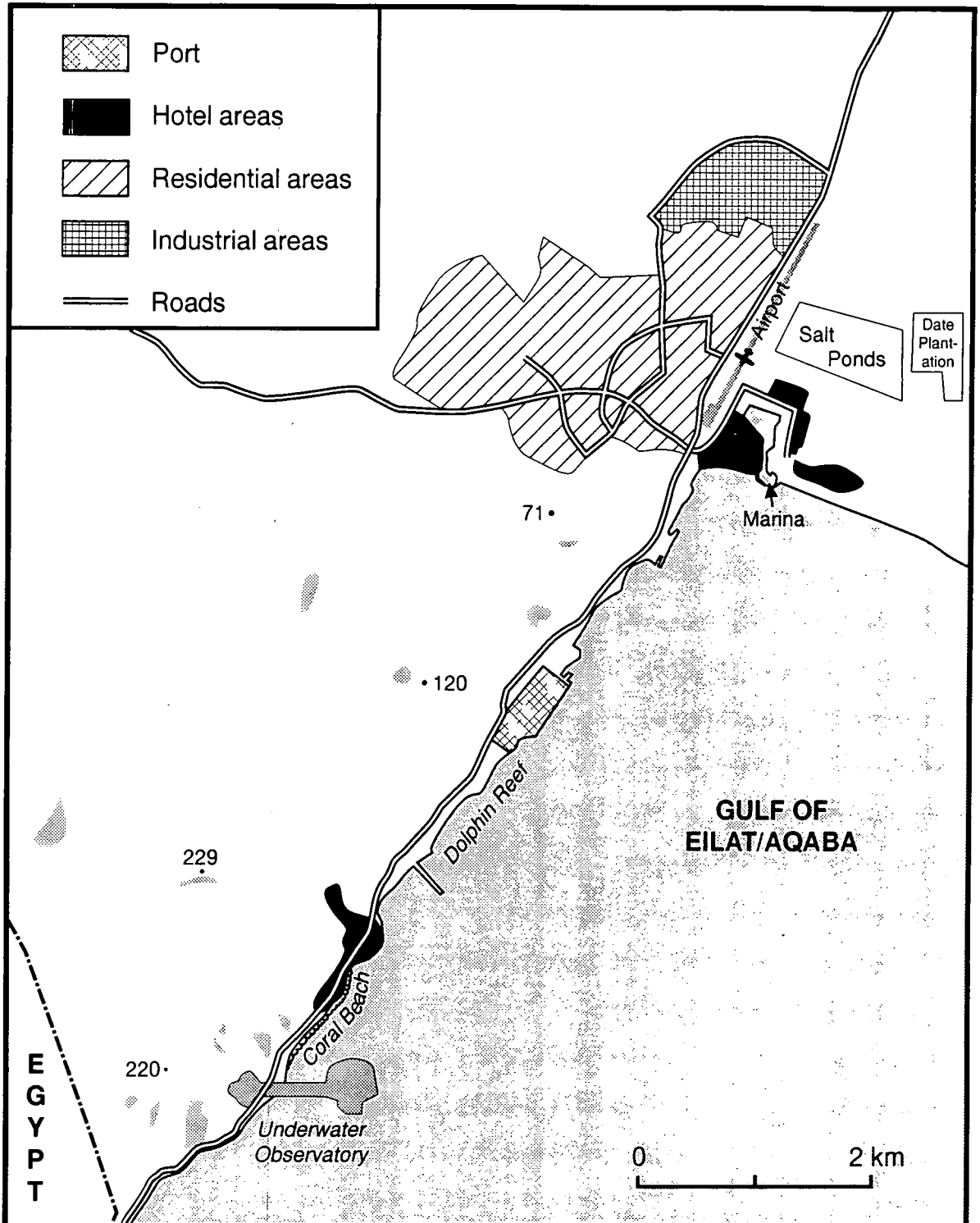
5.2.3 Summary and prospects for future co-operation

The road network on both sides is well developed and they both have similar problems. The roads along the Arava are mainly used for transit from the Red Sea to the north or vice-versa. Their use for local transport is negligible as the Arava Valley is thinly populated. The traffic in Eilat and Aqaba causes pollution and noise.

What are the prospects for co-operation? Following the

Figure 5.4

Spatial distribution of the infrastructure in Eilat



Source: Own draft.

peace the structure of the road network has to change completely if it is to fulfill new and different tasks. Firstly, it needs to be designed for the forthcoming transborder traffic. Secondly, the east-west connections need to be linked with the existing road network on each side.

At the Casablanca summit in 1994 the Government of Israel proposed links between Egypt, Israel and Jordan. The suggested international road would go from Cairo over Suez to Eilat, then to Aqaba and lead on to Saudi Arabia (see Fig 5.5). Another route suggested is an east-west connection south of the Dead Sea (see Fig 5.5). It would go from the north Sinai through the Negev to Safi and Karak; connecting the northern parts of the three adjacent countries. Furthermore, the Israeli road along the Arava Valley would be upgraded to serve as an international road (see Fig 5.5). The function of the Arava Valley as a land bridge would be restored.

The Jordanian proposals at the Casablanca summit were not orientated towards transboundary co-operation. The Ministry of Planning (1994) would like to upgrade the existing backroad in Aqaba. It also suggested to upgrade the road leading from Maan to Aqaba to a highway, also the road leading along the coast to Saudi-Arabia, and the road to the Aqaba airport.

In ancient times camels were used as a medium of transport, not cars, which cause pollution. The question to be asked is: Can the existing roads cope with the increasing traffic until the new ones are built, and are international roads compatible with the environment and the tourism in the region? Also, could Aqaba and Eilat cope with more traffic and is there enough space to build bypasses?

In the short-term the road network offers the

possibility of linking the countries without a great deal of money, with the remote borderlands of the Arava becoming a land bridge between east and west again. The Arava would become a transit valley, but it has to be questioned however whether this is desirable.

There is no doubt that something needs to be done to connect the two road networks. East-west connections could be created by building local, rather than international roads. The increase of traffic should not be encouraged by building international highways. There are other more environmentally friendly solutions which are more compatible with tourism, such as building railways.

The planning of the future road network needs to be undertaken jointly by planners from both sides. The present traffic should be investigated and future estimations need to be done before any decisions are taken. The future of tourism might depend on this decision. A tourist town with traffic jams and air pollution does not appeal very much.

Figure 5.5 Peace roads network



Source: Government of Israel (1994).

5.3 AIR TRANSPORTATION

5.3.1 Eilat Airport

Eilat's airport is situated in the middle of the town next to the tourist area (see Fig 5.4). The departure and landing of aeroplanes is visible and audible from the hotel area, as well as from the beach. As the airfield is very small and only small aeroplanes can use it, all exports from the Moshavim and Kibbutzim have to go to Lodz near Tel Aviv, also tourists from abroad going to Eilat have to stop at Ben-Gurion. There they have to change to smaller aeroplanes, used by the state-owned airline company "ARKIA" to serve the domestic routes.

The number of passengers arriving at Eilat airport in 1990 was approximately 42,000, which was nearly equivalent to the number of departures of 46,314. In 1991 there was a significant decrease of arrivals and departures at Eilat airport because of the outbreak of the Gulf War. The following year the number of passengers arriving and departing increased significantly. In 1993 69,054 passengers arrived in Eilat airport and 69,096 departed, (see table 5.2) which is higher than the number in 1990.

Table 5.2 Passengers arriving and departing at Eilat airport 1975-1993

	1993	1991	1990	1985	1975
Arriving	69,054	16,610	42,572	40,555	554
Departing	69,096	13,842	46,314	37,904	387

Source: Statistical Yearbook 1994, Jerusalem.

Eilat's airport capacity is very limited. As tourist numbers are expected to increase constantly in the near future, it will become exhausted. Therefore, the "Airport Authority" decided in 1989 to build a new airport 11km north of Eilat (Federal Statistical Office, p.93). This has been approved by the government, but has not been started as yet.

5.3.2 Aqaba Airport

Aqaba Airport is the second largest airport in Jordan. It has a capacity of one million passengers a year. Besides the airport in Amman it is the only international airport in the country. With only 4,500 arrivals and 18,000 departures in 1992 (Statistical Yearbook 1992) the airport does not seem to work to full capacity. However, as the numbers given above only include the number of arrivals and departures entering or leaving the country from the airport, the actual number of people using the airport for inland flights is unknown. The fact that the Aqaba-Amman route is subsidized by the state (Federal Statistical Office, 1992, p.77) might give the idea that the Aqaba Airport is underutilized, and even if the actual number of passengers is higher, this is still probably the case.

5.3.3 Prospects for future co-operation

Instead of building a new airport north of Eilat the Israelis could use Aqaba Airport, which has enough spare capacity, and which the Jordanians plan to upgrade in the near future. In this case both sides would gain. Aqaba Airport would no longer be subsidized, and Israel could save by not building a new one. Furthermore the Israelis could export their goods from Aqaba and tourists could fly directly to Eilat's holiday resort.

Should this not be sufficient in future the Jordanians and Israelis could build a joint airport in the Arava as the Israelis suggest in their brochure for the Casablanca summit (Government of Israel, 1994). This joint airport, adjacent to the existing Aqaba airfields could have many faces. There could be a common terminal between the two countries with one exit to Israel and one to Jordan. A similar airport exists in Mulhouse (near Basel), where the airport is built along the boundary; passengers travelling to Germany or France use separate exits, and passengers to Switzerland use the exit for the Swiss side. Another possibility would be two terminals connected by an international passage. There could be joint air control and co-ordination, and a common runway. The variety of the model for the joint airport seems endless.

The project suggested by the Israeli Government bears an encouraging message for transboundary co-operation, but because of the costs and planning involved it seems to be rather unrealistic. Smaller projects can be seen as the foundation for bigger projects, such as the joint airport.

5.4 RAIL TRANSPORTATION

5.4.1 Present and past plans

At present there is no railway in the Arava itself. There is only a stretch of railway in Aqaba, where the Amman-Aqaba railway ends, which is only used for the transportation of Phosphate from Wadi Hasa and Shidiya (see Fig. 5.6). The nearest railway to the Arava Valley on the Israeli side is the Oron-Dimona (see Fig 5.6), which is also used for the transportation of Phosphate.

There have been plans on both sides, to build a railway in the Arava, but due to the high building costs and that it

would have been underutilized, they were never realized.

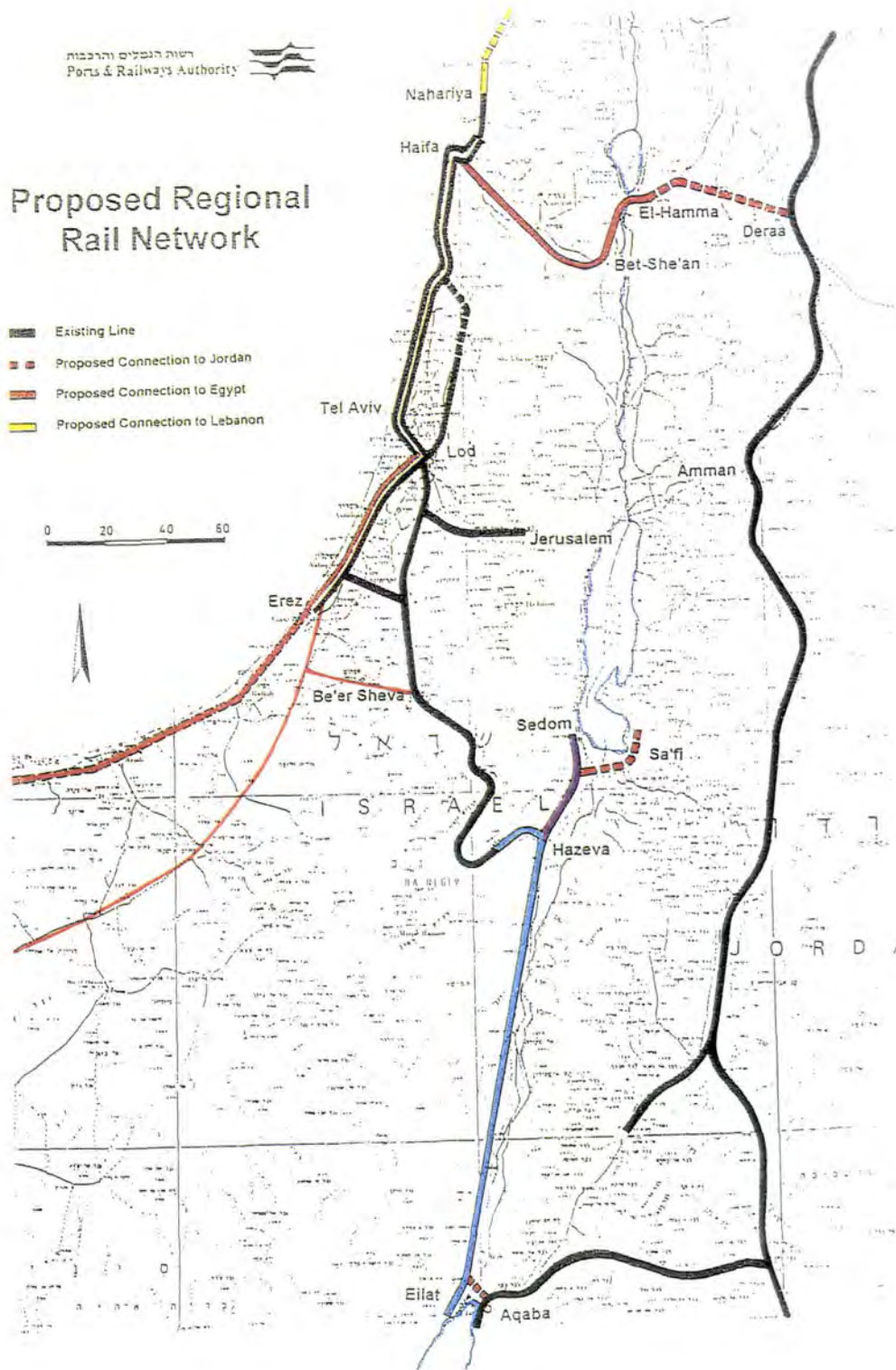
5.4.2 Prospects for future co-operation

The future of the Arava Valley in terms of railways depends on the transboundary co-operation of its adjacent neighbours which was already recognized more than 20 years ago. Then Prime Minister Meir proposed the joint construction and ownership of a railroad from the Dead Sea area to the Eilat/Aqaba terminus on the Red Sea in a meeting between her and King Hussein (Garfinkle, 1991, p.72).

The railway in the Arava Valley is only feasible if the Suez-Nakhl-Eilat-Aqaba railway is built, because heavy cargo could then be transported over the Sinai by train which is cheaper than road or sea transport (Tal, 1988, p.8). This railway could also be used by tourists and Egyptians travelling to Israel or Jordan, and solve the road traffic problem for Aqaba and Eilat, providing that there were also facilities to transport cars by rail.

In the proposals made by the Government of Israel (1994), the Ministry of Planning (1994), and the proposal made by Tal (1988, p.12) to link Safi with the existing Oron-Dimona railway is reflected (see Fig 5.6). This would connect Safi and Sedom with the Mediterranean ports by rail. Jordan could export its goods to the west through one of the Mediterranean ports, rather than through Aqaba and the Suez Canal. Also, Israel could use rail instead of road which is faster and probably more economic than using the windy and steep road from Sedom over Hazeva to Oron/Dimona. Another suggestion made by the Government of Israel is to build a railway line from Hazeva to Eilat, and to connect Aqaba via Eilat with the Israeli system. This would bring great opportunities to the region. Potash, Phosphate and other heavy goods could be transported by rail to one of the ports at the Red Sea, or to one of the Mediterranean ports.

Figure 5.6 Proposed regional rail network



Source: Government of Israel, 1994.

This would diminish air pollution caused by road traffic. Furthermore, the rail-link could be used by tourists travelling from Jordan to Israel; there is no doubt that desert railways have always fascinated travellers. If the railway is connected with Egypt through the Sinai and Saudi-Arabia, not only tourist but also the people in the region would profit from it. Travelling times from Jordan to Egypt through Eilat and the Sinai could be shortened by hours.

5.5. PORTS

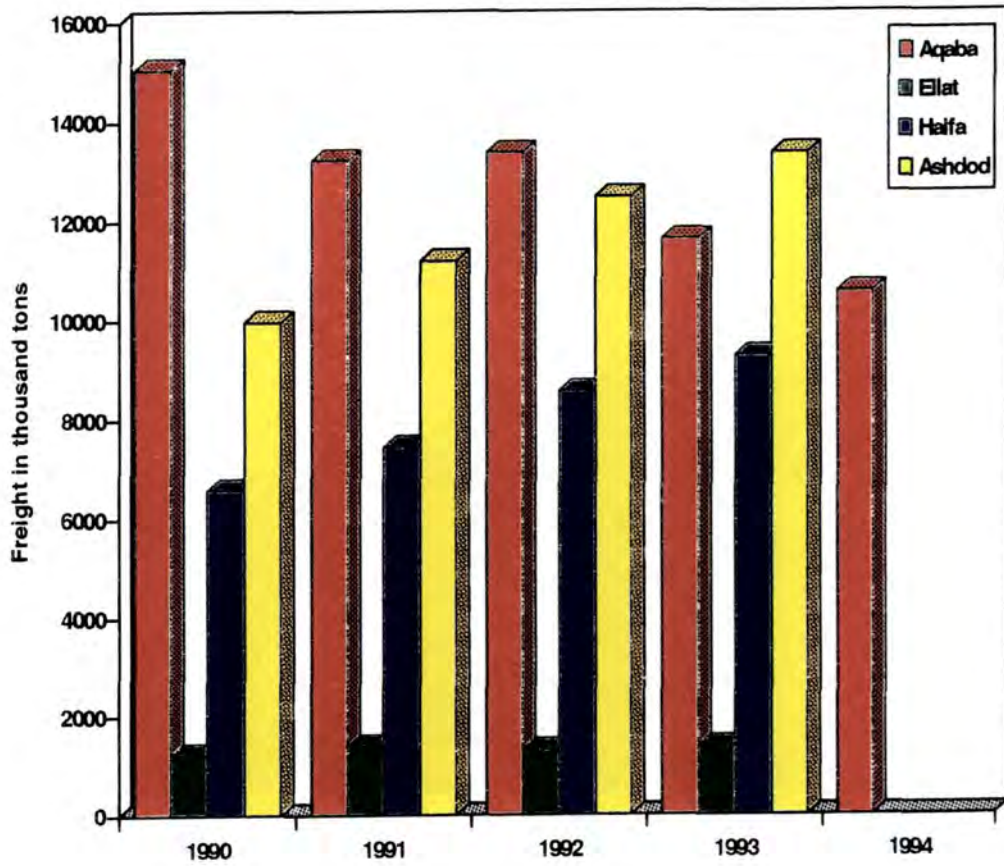
Aqaba's port and Eilat's port are situated less than 6 km from each other, port activities on the other side being observed without using binoculars. Despite their common geographical location at the head of the Red Sea, they differ in characteristics and importance for their respective countries.

5.5.1 Development of the ports since 1950's

5.5.1.1 Eilat's port

Eilat's port, Israel's only outlet to the Red Sea, is situated south of the city (see Fig 5.4). With the changing political situation in the region its importance has changed constantly over the last 40 years. It was only after the Sinai Campaign in 1957 that the port was opened. Until then, shipping lanes to Eilat were blocked by Egypt at the Straits of Tiran. In 1965 the port was inaugurated because the economic relationship between Israel and countries in Eilat's foreland, Asia, Australia, and East Africa were increasing (Feitelson, 1991, p.358). After Egypt blocked the Straits of Tiran again in 1967, war broke out. The outcome of it was the closure of the Suez Canal to all shipping; the Egyptians had sunk ships to block the Suez Canal. As a result a land bridge connecting Eilat with the

Figure 5.7 Freight loaded and unloaded in Aqaba, Eilat, Haifa and Ashdod - 1994



(a) data for Eilat, Ashdod and Haifa for 1994 was not available

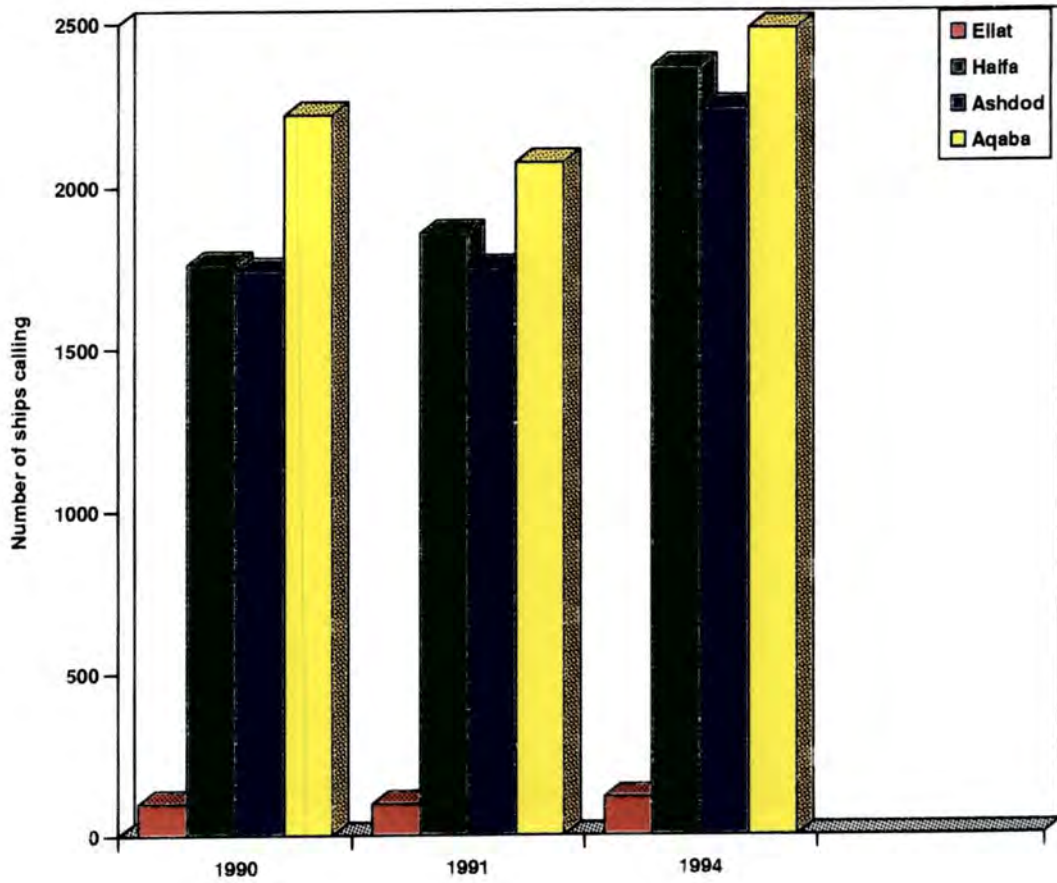
Source: Own draft.

Mediterranean Sea was established in December 1969. In addition, an oil pipeline was built to Ashkelon. Until the end of the 1970's Eilat used to be Israel's main oil harbour; it was connected with Haifa and Ashkelon by pipeline (Lapidoth,1982,p.48). However, in 1979 when Khomeini refused to sell oil to Israel, Eilat lost its importance as an oil harbour.

Another factor which destabilised the position of Eilat was the re-opening of the Suez Canal after 1973 as a consequence of the Israeli-Egyptian peace accord. For the first time Eilat was in competition with Haifa and Ashdod, "This competition and the dramatic reduction in trade between Israel and Iran following the fall of the Shah of Iran in 1979 reduced the demand for Eilat's port services" (Feitelson,1991,p.358). The cargo traffic through Eilat's port decreased from over 1.2 million tons in 1979 to less than a million tons by 1983. In 1991 it had the same amount as in 1983 (see Fig 5.7). As Lapidoth (1982,p.48) remarked, "instead of unloading at Eilat, many ships have preferred to pass through the Suez Canal and unload at the Mediterranean ports of Ashdod of Haifa, which are much nearer to the center of the country and its industrial areas". Compared with Ashdod and Haifa the quantity of freight loaded and unloaded at Eilat seem to be negligible, and compared to Aqaba it is even insignificant (see Fig 5.7).

Looking at Potash and Phosphate export through Eilat Port, a similar picture can be seen. Exports through Eilat Port are far smaller than that through Aqaba. The fact that just 200 vessels called at Eilat in 1992 (see Fig 5.8) confirms the impression that the port is underutilized. Without being subsidized by the state it would already have been closed.

Figure 5.8 Number of ships calling at Aqaba, Eilat, Haifa and Ashdod - 1990, 1991 and 1993



Source: Own draft.

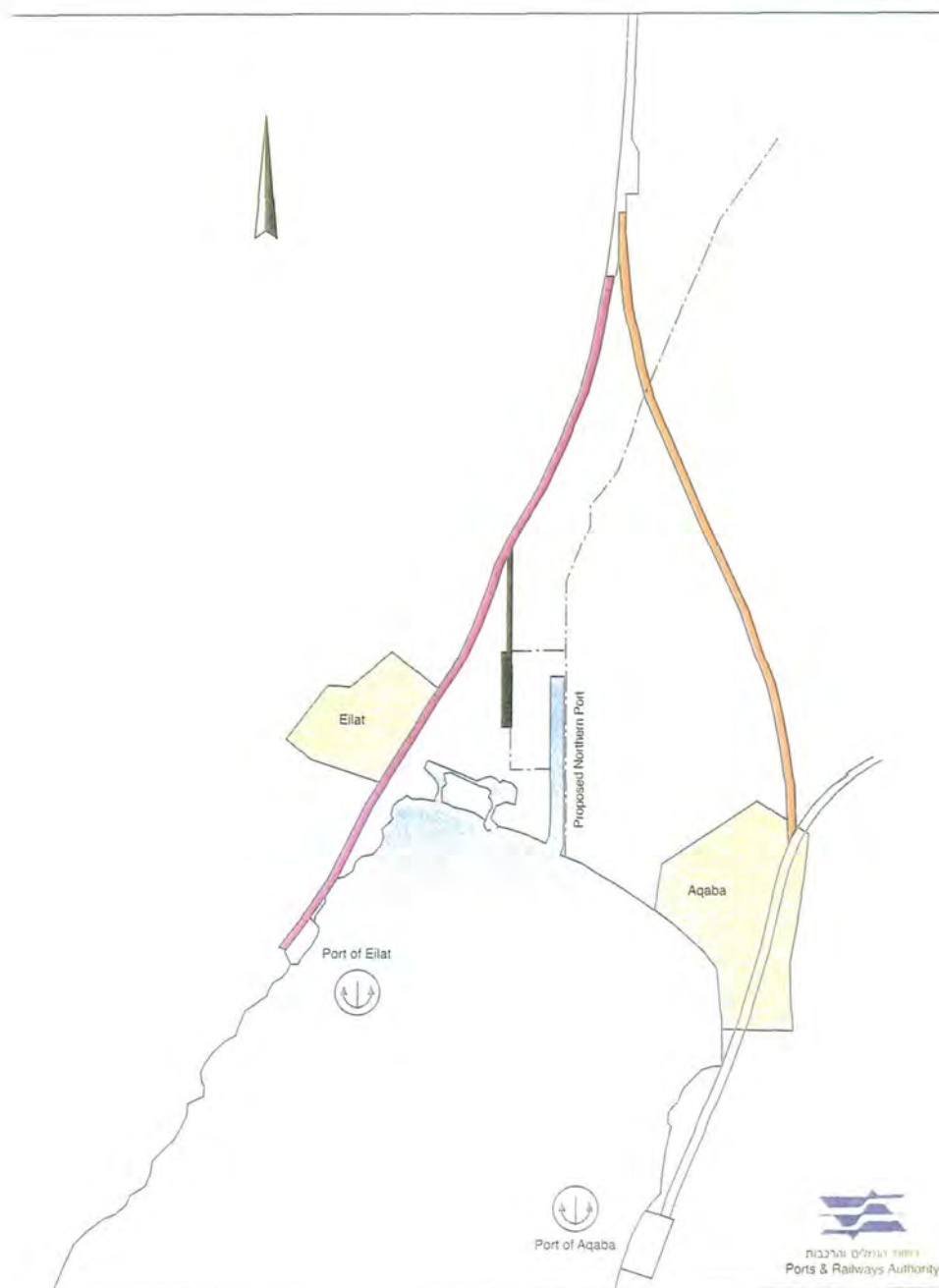
follows: the port is a major threat to Eilat's coral reef in the south (see Fig 5.4); it is located between the hotel area (the town's economic base) in the north of Eilat and the coral reef (the region's major natural resource attraction); the road leading to the port through Eilat causes safety problems; and it occupies a considerable amount of Israel's 11 km long Red Sea waterfront.

Eilat's port only flourished when the Suez Canal was closed and the Negev was used as a land bridge. The present port activities are negligible, with the port somewhat inhibiting the tourism industry. Taking everything together it seems to be reasonable that local planners would like the port to disappear. Therefore, a proposal has been made to build a new port at Israel's north shore of the Gulf of Aqaba/Eilat (see Fig 5.9). The project has not been realised so far as the costs are too high and the port might threaten the expansion of the existing hotel resort on the north shore.

5.5.1.2 Aqaba's port

Aqaba's port is Jordan's only outlet to the sea. It was built in the 1950's partly because Jordan could not use Ashdod and Haifa, situated on the Mediterranean Sea, for its freight anymore. Before 1950 most of the freight went through these ports or Beirut. Beirut offered many advantages compared to Aqaba: firstly it is nearer to Amman, and secondly the freight rates to Europe were cheaper. For these reasons at the beginning of the 1950's Aqaba was not an ideal alternative to Beirut (Drysdale, 1984, p.91).

Figure 5.9 Location of the Northern Port including proposed rail connection to the Red Sea ports



Source: Government of Israel (1994).

With the closure of the Syrian border, Beirut could not be used anymore, therefore Aqaba became of great importance to Jordan. In the 1970's Aqaba experienced explosive growth for a number of reasons. In the 1970's political problems arose in Lebanon and Syria with the overland route to Beirut being cut-off, with Aqaba becoming Jordan's only outlet to the sea. Another impetus came in the 1980's when the route through Aqaba became one of Iraq's few lifelines to the outside world during the war with Iran (Chapin,1991p.157; Mostyn,1982,p.10). By 1981 some 62% of incoming shipments were destined for Iraq. By 1982 Aqaba even had one of the biggest container ports in the Middle East (Mostyn,1982,p.10). The route to Iraq through Aqaba increased over the following years and reached a peak in 1988 (see Table 5.3). With the embargo against Iraq the transit decreased significantly. In 1992 only 1.96 million tons compared to 4.46 million tons in 1988, went to Iraq (see Table 5.3). The amount of freights loaded and unloaded of tons at Aqaba port decreased constantly from 1990 to 1994 (see fig 5.6).

Table 5.3 Imported and Exported Volumes through Aqaba Port, 1985-1992 (in million tons).

	1985	1986	1987	1988	1989	1990	1991	1992
Exports	8.18	9.70	11.27	10.95	9.99	8.87	7.68	7.36
Imports:	6.37	7.15	8.74	9.14	8.69	6.16	5.55	6.02
To Jordan	2.36	2.69	2.80	2.21	2.53	2.93	4.02	3.92
Transit to Iraq	4.01	4.46	5.94	6.93	6.16	3.23	1.52	1.96

Source: Statistical Yearbook 1992 of the Hashemite Kingdom of Jordan, and data presented in the report of the Delegation of the European Community.

Another important factor for the expansion of Aqaba port is the Phosphate and Potash exports, with more than half of the goods exported through Aqaba port being Phosphates (see Table 5.4).

Another important port activity is the Aqaba-Nuweiba ferry which was established in 1985. In 1992 more than 1.2 million people arrived and departed at Aqaba port (see Fig 5.9), with the number of people using this service increasing steadily since then. Most of the people using the ferry are Egyptian guest workers travelling to Jordan or home to Egypt. "The service has cut transit time between Al Aqabah and Cairo in half, to about nine hours" (Metz, 1991, p.157).

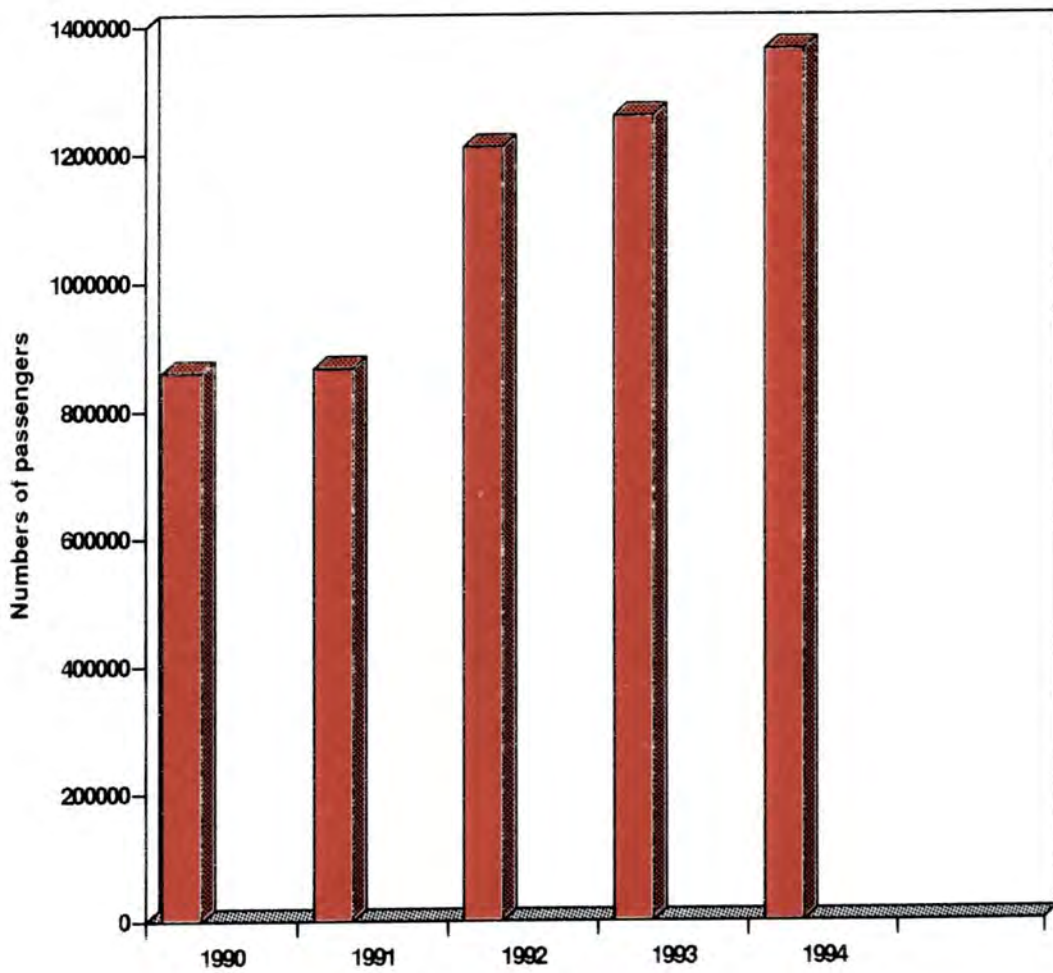
Table 5.4 Major kinds of exported goods through Aqaba Port during 1988-1992 (in million tons).

	1988	1989	1990	1991	1992
Total Thereof:	10.95	9.99	8.87	7.68	7.36
Fertilizers	0.60	0.57	0.67	0.66	0.55
Phosphates	5.81	6.41	4.87	4.25	4.26
Potash	1.29	1.24	1.39	1.27	1.23
Transit to other countries	2.92	1.15	0.35	0.04	0.04
Jordanian Goods	0.30	0.48	1.46	1.39	1.14

Source: Statistical Yearbook 1992 of the Hashemite Kingdom of Jordan.

Aqaba's present importance for Jordan is as an outcome of the political situation in the Middle East. Drysdale (1986/87, p.91) remarked that "if Aqaba had competed freely with Beirut, and the northern overland route had been more reliable, the new port might never have flourished". The main goods exported through its facilities are Phosphate and

Figure 5.10 Numbers of passengers arriving and departing at Aqaba port 1990-1994



Source: Own draft.

Potash, but as the amount carried to Iraq is decreasing steadily in the 1990's, the port has spare capacity.

5.5.2 Summary and prospects for future co-operation.

Looking at the present situation of the two ports, both Eilat and Aqaba have spare capacity. Therefore, as Gradus (1994,p.316) suggested, Jordan could use Eilat's port facilities, which would give the port new impetus. On the other hand it has to be seen that Eilat could buy services from Aqaba port. It could be argued that Aqaba is more orientated towards port activities than Eilat, and therefore has the better facilities. Also, with the Iraq embargo capacity is available in Aqaba, with the Jordanians intending to expand the port facilities in the near future (Ministry of Planning, 1994). In that case Eilat port could be closed down and the area be used for tourism. This would, in the short-term, be the cheapest possibility and both sides would benefit. Eilat would also solve its traffic problems with its port. As already mentioned above, planners in Eilat would prefer the port to disappear completely.

Another possibility is a joint Aqaba/Eilat Port 11 km north (see Fig 5.8) of Eilat, which was suggested by Raz (1989,pp.327ff) and the Government of Israel (1994), having the following advantages: it would provide a location for a coal-fuel water-cooled power plant, which would offer the possibility to desalinate water, which could then be used for aquaculture (see agriculture chapter); Aqaba and Eilat could reach their potential for tourism; and future oil-spills could be limited to the harbour area. But as already mentioned, the port might interfere with the expansion of the hotel resort on the north shore.

An Aqaba/Eilat port would provide the opportunity for developing a land bridge from the Far East to Europe as an

alternative to the Suez Canal, which would give an economic impetus to the region. However, this might not happen for the following reasons: the Negev land bridge established after the closure of the Suez Canal did not survive the 1970's. Gradus (1977,p.31/32) gave several reasons for this, of which two still might apply today. Firstly, by using larger ships and tankers to round Africa, the costs for the longer distance were adjusted. Secondly, the mixed sea-land-sea route discouraged many shippers. Above all, it has to be taken into account that Aqaba and Eilat ports might have to compete with the northern overland route again, or even Beirut port.

Instead of expanding the present port facilities, they could be changed into tourism facilities. Yacht harbours could be built and the waterfront could be confined to tourism. Furthermore, repair facilities for yachts could be established. According to Israeli sources, there are no repair facilities available for yachts in Eilat and only limited facilities in Aqaba. The future of both ports seems to be uncertain as far as their role as commercial harbours is concerned, and only transboundary co-operation will guarantee their survival, or at least one of them.

5.6 THE FUTURE OF THE TRANSPORTATION INFRASTRUCTURE IN THE ARAVA VALLEY

There is common agreement that economic development is a condition for long-lasting peace in the Middle East. There is also no doubt that the economic development in the region depends on a well developed transportation infrastructure which allows goods and people to move from one country to the other without any problems. As Tal (1989) remarked: " The existence and development of a transportation infrastructure is an obvious precondition for the development of bilateral and... multilateral co-operation.

Furthermore, the transportation infrastructure required for regional co-operation in trade, tourism, or joint economic and technological ventures is, at the same time, a function of the intensity of such relations."

However, as shown above, the existing transportation in the Arava Valley is sufficient for the local and national needs, but in terms of international traffic the road network needs to be extended and railways need to be constructed.

Previously, many plans have been made independently by Jordan and Israel to improve the infrastructure in the Arava Valley, but because the costs were too high and the political situation unstable they were never realised. Following the peace all the joint projects which have been suggested now seem to be within reach. The planners of the parties involved need to make both short and long-term plans which will decide the future of the Arava Valley. Undoubtedly, all kinds of conflicts of interest might arise. For example, Jordan might say that the joint port brings more advantages for Israel, and would prefer to extend its own port facilities instead of building a new joint port. Furthermore, national interests might interfere with local interests. For example, the development of the joint port might be of national interest for the whole country but might bring less profit to the people in the local area.

The development of the transportation infrastructure through transboundary co-operation in the Arava Valley and its adjacent area will be vital for the socio-economic development of the region.

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Chapter 6

INDUSTRY

6.1 THE ISRAELI AND JORDANIAN ECONOMY COMPARED

When talking about the prospects of transboundary co-operation in industry in the Arava Valley it is important to consider the economic conditions in the two neighbouring countries.

The Gross National Product (GNP) is considered to be a good measure to assess the economic performance of an economy or to compare it with other economies. With a GNP of \$13,220 per capita per year (see table 6.1) Israel's economy can compare itself with Western European Countries such as Spain. Jordan on the other hand with a GNP of \$1,120 ranges far behind Portugal, the poorest European Community member, with a GNP of \$7,450 per capita. Compared to other Middle Eastern countries such as Syria with a GNP of \$1,170 Jordan does not look too bad. Its neighbour Saudi-Arabia only achieved its high GNP of \$6,200 because of its oil revenue. Comparing Saudi-Arabia's GNP with Israel's, Israel's GNP is double that of Saudi-Arabia (Album, 1995, p.30). Comparing Israel with Jordan, Israel's GNP is more than ten times higher. Israel belongs to the countries with a high income¹ whereas Jordan finds itself at the bottom of the medium income category.

¹ The Worldbank divides countries into three categories according to their GNP per capita:

1. Countries with low income (up to 650 US-\$)
2. Countries with medium income
 - a) 650 to 2520 US-\$
 - b) 2520 to 8000 US-\$
3. Countries with high income

Table 6.1 GNP per capita of selected countries in 1992

USA	\$23,240	SAUDI-ARABIA	\$ 7,010
GREAT BRITAIN	\$17,790	TURKEY	\$ 1,980
SPAIN	\$13,920	SYRIA (1990)	\$ 1,170
ISRAEL	\$13,220	JORDAN	\$ 1,120
PORTUGAL	\$ 7,450	EGYPT	\$ 640

Source: Der Fischer Weltalmanach (1995), pp.31-42.

Between 1980 and 1992, Jordan's GNP decreased by 5.4 %, whereas Israel's increased by 1.9 % (Fischer Weltalmanach, 1995, p.31-36).

Another important factor to consider when assessing the performance of an economy is to see which sectors contribute to the Gross Domestic Product (GDP) or Net Domestic Product (NDP). Looking at the origins of the NDP in Israel in 1993 (see Table 6.2) it shows that industry with 21.5%, together with the private and public services (26.8 %) are the main contributors. These are followed by banking with 18.6 %. It is quite remarkable that Israel's agricultural sector only contributes 2.4 %, which is negligible compared to the other sectors.

Looking at the Jordanian GDP the main contributor is government services, but the second most important contributor is the restaurant and hotel sector (see Table 6.3). Jordan's manufacturing sector only contributes 12.9 %. Industry contributes significantly to Israel's GDP, which is considered to be important for having a strong economy. Agriculture plays a more important role for Jordan than for Israel.

Table 6.2 Origins of the Israeli net domestic product in 1993

Origins of net domestic product % of total	
Agriculture	2.4
Industry	21.5
Construction	8.9
Transport, storage & communications	7.6
Commerce & hotels	11.6
Ownership of dwellings	7.3
Financial services	18.6
Public & private services	26.8
Imputed bank charges & subsidies	-4.1
Total (incl others)	100.0

Source: E.I.U Country Report Israel 4th quarter 1994, p.4.

Table 6.3 Origin of the Gross Domestic product in Jordan in 1993

Origin of gross domestic product (% of total; current prices)	
Agriculture, forestry & fishing	6.3
Mining & quarrying	2.6
Manufacturing	12.9
Electricity & water	1.4
Construction	12.2
Wholesale & retail trade, restaurants & hotels	16.8
Transport & communications	13.0
Financing, real estate & business services	16.0
Community, social & personal services	2.1
Government services	17.3
Other services	1.4
Imputed bank service charge	-2.1
Total	100.0

Source: E.I.U. Country Profile Jordan 1994-1995, p.15.

Whilst looking at the exports and imports of the two countries further differences can be noticed. Firstly Jordan's exports and imports are of a smaller scale than Israel's (see Table 6.4 and 6.5). Besides the export of chemicals, manufactured goods, potash and phosphate the trade in food and live animals is very important for Jordan.

Table 6.4 Jordan's principal exports and imports 1993

Exports (\$ millions)		Imports(\$ millions)	
food & live animals	202.1	food & live animals	628.1
phosphates	141.3	crude oil	341.8
potash	124.2	chemicals	358.8
chemicals	282.1	manufactured goods	731.4
manufactured goods, machinery & transport equipment	227.4	machinery & transport equipment	953.9
		Miscellaneous manufactured articles	217.6

Source: after E.I.U. Country Profile 1994-1995, p. 32.

Israel's principal export goods are industrial products such as machinery and electronics, as well as diamonds and chemicals (see Table 6.5).

Looking at the destination of exports and the main origins of imports, further differences can be noticed (see Fig 6.1 and Table 6.6, 6.7). The main export market for Israel is the U.S. and the members of the EU (Wolffsohn, 1987, p.259; Razin, 1993, p.177). For Jordan the main markets are Middle Eastern Countries such as Saudi-

Arabia and Iraq, as well as India and other Asian countries. For imports both countries have similar patterns. For both countries the U.S. and Western European countries are the main trading partners.

Table 6.5 Israel's principal exports and imports 1993

Exports (\$ millions)		Imports (\$ millions)	
Metal, machinery & electronics	5,080	Investment goods	3,577
Diamonds (worked)	2,990	Diamonds (net)	3,352
Chemical goods	1,871	Consumer non-durables	2,258
Textiles, clothing & leather	932	Fuel	1,742
Agricultural goods	558	Consumer durables	1,268
Food	543	Other production inputs	9,109

Source: After E.I.U. Country Report Israel 4th quarter 1994, p.4.

Table 6.6 Israel's main export destinations and main origins of imports 1993

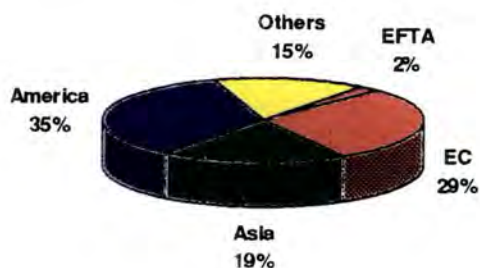
Main destinations of exports	% of total	Main origins of imports	% of total
U.S.A.	30.9	U.S.A.	17.7
U.K.	5.5	Belgium-Luxembourg	17.2
Belgium-Luxembourg	5.4	Germany	10.4
Germany	5.3	U.K.	8.6
Japan	5.2	Switzerland	7.4
France	3.9	Italy	7.3

Source: After E.I.U. Country Report Israel 4th quarter 1994, p.4.

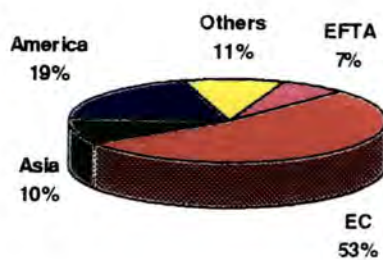
Figure 6.1 Geographical distribution of exports and imports 1994

ISRAEL

Exports

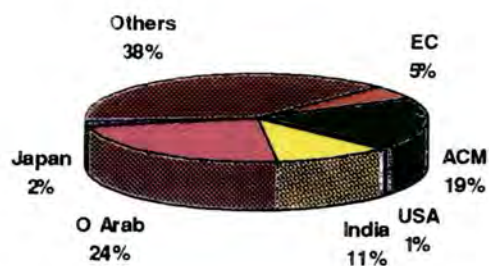


Imports

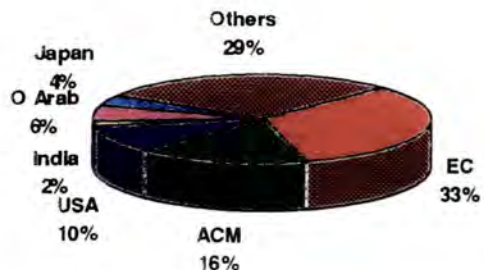


JORDAN

Exports



Imports



Source: Own draft.

Table 6.7 Jordan's main export destinations and main origins of imports 1993

Main destinations of exports	% of total	Main origins of imports	% of total
India	9.5	Iraq	12.5
Saudi Arabia	11.6	U.S.A.	12.7
Iraq	11.2	Germany	8.3
Indonesia	5.4	Japan	5.0
U.A.E.	4.4	Italy	5.5
Russia	3.7	U.K.	5.2

Source: After E.I.U. Country Profile Jordan 1994-95, p.32.

There are two types of industrial companies to be found in Jordan: the privately owned ones which produce mainly food products, clothing and consumer goods, and are mostly located in Amman; and there are large scale companies, partly owned by the state, producing chemicals, petrochemicals, fertilizers and mineral products. The main characteristic of Jordan's industrial sector is that "much manufacturing activity is related to exploitation of natural resources and to the mining sector" (Metz, 1991, p.147).

In Israel the situation is different. Over the last decade the importance of electronic exports has increased, whereas traditional industries such as textiles have decreased (Rivlin, 1992, p.63). The electronic industry is one of the main contributors to the internationalisation of the economy (Rivlin, 1992, p.66), "gradually transforming the pattern of the country's exports and is likely to be an important factor in future economic growth" (Ozanne, 1995, p.20). Because of the highly qualified workforce Microsoft, IBM and other computer manufacturerers have opened factories or research centres in Israel. According to Ozanne (1995, p.20) "Israeli electronic companies such as

Scitex, Indigo, Lannet, ECI, Telecomm and Elscint are at the cutting edge of research and development and are world leaders in their field". However, this kind of high-tech industry is concentrated along the Mediterranean Coast and, unfortunately, not in the Arava Valley.

As Hausman (1993,p.52) remarked, "Israel has developed a relatively modern industrial sector, with a considerable technological capacity, a substantial reliance on capital markets and a heavy reliance on exports"; whereas "Jordan includes an industrial sector characterized on the whole by smaller plants with a lower level of technology and a higher degree of family ownership and financing".

Israel with its high GNP belongs to the developed countries in the world, whereas Jordan belongs to the less developed. Also Israel's manufacturing industry is high-tech orientated, whereas Jordan's is orientated towards consumer goods or related to natural resources. In Israel the unemployment rate in 1992 was 11.2% compared to Jordan with 25%.

6.2 INDUSTRY IN THE ARAVA VALLEY

How important is the industry located in the Arava Valley in the national context? In Israel there is a concentration of industrial towns with Arad, Dimona and Oron in the Negev. The development of these industries is undoubtedly linked with the natural resources of the Negev, such as the minerals of the Dead Sea and the phosphate mines such as at Har'zin. However, the main concentration of industry is to be found along the Mediterranean Coast.

Looking at Jordan a different situation is to be found. Three out of the five big Jordanian companies have plants in Safi or Aqaba. There is the Jordan Phosphate

Mines Company and the Jordan Fertilizer Industries in Aqaba, and the Arab Potash Company in Safi. The equivalent to Dimona and Arad is Aqaba. In Aqaba the natural resources are processed, because it is the only outlet to the sea which offers the appropriate transportation. Aqaba is one of the most important industrial towns in Jordan, besides Safi and Amman. The potash extraction from the Dead Sea, phosphates, and the phosphate based fertilizer production in Aqaba, together with medicaments, and detergents, account for around 60 % of Jordan's total exports (World Bank, 1994, p.22). Furthermore, "about 70 % of total manufacturing output was closely linked to the mining and extracting sector" (Metz, 1991, p.149).

The mining and extraction sector of the Arava Valley region, as well as the related industry in Aqaba, is vital for Jordan's economy. Looking at Israel, the minerals of the Dead Sea and the phosphates of the area are important for the industry of the Negev, but the mining industry does not account for such a high degree for exports as in Jordan. The Jordanian industry in the Arava Valley is vital for Jordan's exports, whereas it is not for Israel's.

Looking at the spatial distribution of industry in the Arava Valley three main locations can be identified: Firstly, there is Sodom, where the Israeli Dead Sea Works are located. Secondly, there is Safi with the Arab Potash Company, which is the Jordanian equivalent to the Israeli Dead Sea Works. Thirdly, there is the chemical industry in Aqaba. Industry in all three locations is linked with the mining and extracting sector of the Dead Sea and the phosphate mines in the area.

Apart from these three main locations there is the Kibbutzim industry in the south of the Arava Valley, which mainly processes food such as dairy products. There is some light industry in Eilat which produces electrical and

mechanical products (see Atlas of the Negev, 1985, p.42/43).

In 1975 Timna, with an estimated 20 million tons of lowgrade copper ore, had a total copper production of 8000 tons. In 1976 the copper mine was closed because of the rapid decline of copper prices on the world market (Europa Publications, 1994, p.538).

6.2.1 Dead Sea resources

The Dead Sea is one of the world's richest areas in potash, bromide magnesium and other minerals. These minerals are used in the production of pharmaceuticals, insecticides and fertilizer. Biger (1995, p.112) remarks that "the estimated mineral reserves of the Dead Sea are 22 billion tons of magnesium chloride, 12 billion tons of sodium chloride, 6 billions of calcium chloride and 1 billion ton of magnesium bromide".

The particular feature of the Dead Sea resources is that they are extracted by evaporating Dead Sea water in large evaporation ponds, utilizing solar energy. The annual Israeli production of potash requires evaporation of about 150 million cubic metres of sea water, and only the use of solar energy makes the extraction economically feasible; using conventional energy would be too expensive (Energy 1991, p.59).

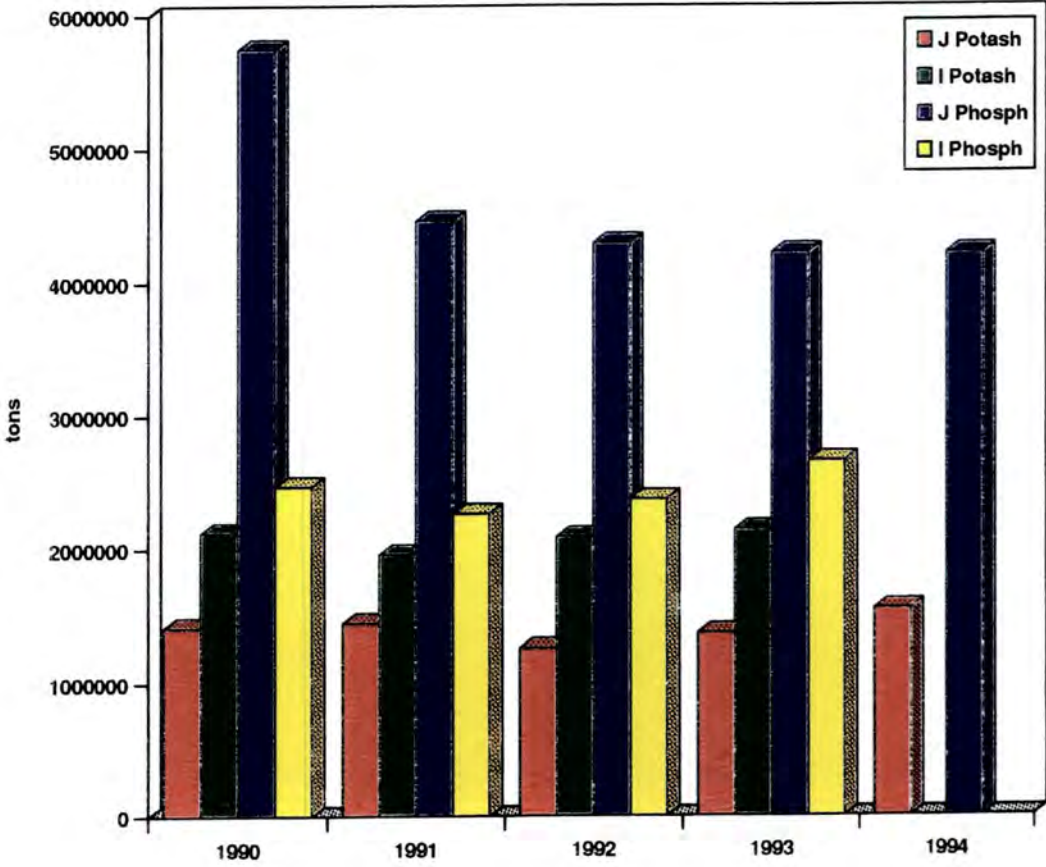
Over the last decade problems have started to arise at the Dead Sea. As Israel and Jordan began using the water of the Jordan and the Yarmuk rivers, as well as that of Lake Tiberias and the inlets to the Dead Sea for agriculture and other applications, the water level of the Dead sea began to fall rapidly (Biger, 1995, p.111). To raise the level of their evaporation ponds south of the Dead Sea the Israeli's pumped water from the northern part into the the large pans

at the south of the Dead Sea, lowering the water level of the northern part of the Dead Sea considerably.

6.2.1.1 The Israeli Dead Sea Works

After obtaining an unlimited licence for exploiting the Dead Sea resources in 1929, British and Jewish-Palestinian partners founded the Palestinian Potash Company which in the 1950's changed its name and became known as the "Dead Sea Works". The company started its extraction at the northern end of the Dead Sea, in Kallia. In 1937 the company added another plant at Sodom at the southern end of the Dead Sea because there was more space available for evaporation pans. Then in 1948, during the War of Independence, the plant at Kallia was destroyed and the site remained in Jordanian territory. Sodom became the major site for the Israelis to exploit the minerals of the Dead Sea. Following re-partition, production started in 1952. In 1955 the Bromide Company was founded and built its factory near the Sodom Potash works. Soon afterwards the two companies were integrated into the Dead Sea Works. Today the Israeli's produce about 2 million tons of Potash a year (see Fig 6.2). \$122.5 million out of the total of \$296.2 million earned in mining and quarrying is exported to the EU. (see Table 5.8), \$40.2 million to the U.S.A., \$26 million to Brazil and \$19.5 million to China. The main countries of export in the EU for Potash and Phosphates are the Netherlands, France and Italy.

Figure 6.2 Potash and phosphate production in Israel and Jordan - 1990 - 1994



(1) data for Israel for 1994 was not available

Source: Own draft.

Table 6.8 Exports, mining & quarrying by main country of destination in 1991/1992 \$ million (Israel)

Country of destination	1992	1991
Grand total	303.6	299.7
E.U.	138.5	148.7
Thereof:		
Italy	22.3	26.1
Netherlands	51.6	52.8
France	39.3	45.3
E.F.T.A.	6.9	7.1
Other main countries	92.4	132.2
Thereof:		
U.S.A.	25.8	27.4
Brazil	23.1	19.2
South Africa	14.2	13.6
Hong Kong	0.4	15.6
Other countries	65.8	20.7

Source: Statistical Abstract (1993), p.271.

6.2.1.2 Arab Potash Company

The Arab Potash Company, the equivalent to the Dead Sea Works, only started production in the winter of 1982 - 1983, although the project to build a plant was already initiated in the mid-1950's. The plan was to extract 1.2 million tons of potash a year from the Dead Sea. This aim was reached at the beginning of the 1990's. In expectation of a further rise in the demand for potash, and being confident that they can sell what they produce, future plans have been drawn up to raise the present production of 1.5 million tons (1994) to about 2 millions tons in the next four years, by adding another carnallite pan with an estimated cost of about \$70 million (MEED January 27, 1995, p.20). This considerable investment shows that the Jordanians are very interested in increasing their potash production.

Future projects are intended to extract non-potash mineral reserves in the Dead Sea (MEED, January 27, 1995, p.20). Furthermore, they would like to develop an Al Safi Industrial Workshop complex (Ministry of Planning, 1994). The workshop is designed to meet requirements of the local industrial companies such as the Arab Potash company and the Jordan Phosphates Mining Company. This project is expected to develop the southern region of Jordan and to create new jobs. Another aim of the workshop is to save repair time and foreign currency (Ministry of Planning, 1994). As the Arab Potash Company is expanding, as well as the industry related to it, Safi is becoming more and more industrial.

The main market for Jordan's potash products lies in Asia and the Orient. More than 85 per cent of the company's production has been exported to Asia and the Orient (see Table 5.9). In 1994 Jordan sold about 500,000 tons of Potash to India which is its biggest customer (MEED, January 27, 1995, p.20).

Table 6.9 Sales of phosphates by geographical areas (including quantities delivered to industrial complex in Aqaba) - 1991/1992 in million tons (Jordan)

Year	Industrial Complex	Asia & Orient	Western Europe	Eastern Europe	Other Countries	Total
1991	0.91	3.29	0.26	0.67	0.03	5.16
1992	0.93	3.25	0.36	0.54	0.12	5.20

Source: Statistical Yearbook 1992, Amman, p.148.

6.2.1.3 Prospects for co-operation

Despite the advantage of using solar energy, extracting the Dead Sea resources is not cheap. The maintenance of the evaporation ponds, as well as the

construction of new ones, are expensive undertakings. Therefore, the proposals by the Israelis (Government of Israel, 1994) to erect joint dams to safeguard against floods, and to build joint evaporation ponds for the production of potash solution, would save considerable amounts of money for both sides.

Furthermore the Government of Israel (1994) suggests a joint conveyor for transporting potash from the Jordanian and Israeli plants to the ports of Aqaba and Eilat. In 1974 the Director General of the Israel Chemicals Company already acknowledged that the joint exploitation of the Dead Sea would bring mutual benefit to both sides and that a joint venture had been discussed with the Jordanians, since the foundation of Israel (Krankovsky, 1976, p.142). Moreover, transit rights to and from Israel's Mediterranean ports could be given to the Jordanians, although until now Jordan has had to send all its potash and phosphate exports via Aqaba.

The Israelis even go so far as to think of joint marketing of these products and co-operation in developing new products and cosmetics based on the mineral and natural reserves of the Dead Sea.

The Israeli proposals would undoubtedly bring great benefit to both companies. As Biger (1995, p.115) remarked, "at the present two totally separate establishments are working with the same procedures in the same area, producing the same products".

However, to co-operate to such an extent unlimited trust between the two partners is necessary. Also, at the present the companies are competitors on the world market. On top of this the Israelis are ahead in the technology relevant for exploration. Rivlin (1992, p 63/61) remarked that "Israel's success in the international potash market

is a function of its abundant and high-quality raw materials, modern technology, successful management and marketing strategy". Apparently the Arab Potash company consulted the Israelis about their know-how for the production of bromide (Government of Israel, 1994).

There is potential for transboundary co-operation in the long-term, but in the short-term the Dead Sea Works and the Arab Potash Company are two separate companies competing with the same products on the World Market. This is illustrated by the fact that the Israeli's entered the Indian phosphate market, squeezing Jordanian's exports to India. This happened because the state subsidies and the changed political circumstances allowed Israel to do so (E.I.U., Country Report Jordan, 3rd quarter 1994, p.16). The same might happen to the potash market.

6.3 THE KIBBUTZ INDUSTRY

The Arava Valley cannot be considered as industrialised, but there are small plants with between 1 and 25 employees in various Kibbutzim. In the North, Ein Gedi produces cosmetics, rubber and plastics. The Kibbutzim in the south of the valley produce food and beverages. Yotvata, for example, runs a dairy whose products are well-known in Israel.

As the agricultural sector has reached its limits in creating jobs, industrialisation is the future of the Kibbutz and the Moshav. Manufacturing products such as agricultural supply equipment, and systems designed to maximize agricultural production under extreme conditions, which very often have been developed in the Moshavim or Kibbutzim, would be one possibility to do so. The agrotechnology developed in the Arava Valley could be manufactured there.

6.3.1 Prospects for co-operation

The Israelis are thinking of joint ventures with Jordan in manufacturing the agro-technology in the Arava Valley. In that case the Israelis provide the know-how and the management and the Jordanians the labour. This would bring jobs to the Arava Valley. Dr Collette Serruya (Jewish Agency) could even imagine the production of high-tech equipment such as computers in the Arava Valley. To draw parallels to the Silicon Valley seems to be exaggerated, but it has to be given a thought because of Israel's success in the electronics industry. According to Albrecht (1994, p.59) "the region's growth in information technology is projected to expand over the next five year at almost 14 per cent". The development of the industry could be re-enforced by a joint research center between Jordan and Israel.

6.4. THE RED SEA (AQABA/EILAT)

Eilat is not an industrial town, but depends primarily on the tourist industry (see chapter 7). However, there is some electrical, metal and food producing industry to be found, which is of minor importance.

Compared to Eilat, Aqaba is highly industrialised. With its strategic position by the sea, Aqaba has benefited from the extensive transport needs of heavy industry. The fertilizer production in Aqaba is run by the Jordan Phosphate Mining Company. Dimmonium phosphate is produced from raw phosphate, imported sulphur and water. Since 1994 production has reached about 740,000 tons as production capacity has increased. Almost all of the fertilizer produced is exported through the port. A new plant with a production capacity of 300,000 tones per year is planned as a joint venture with Japan, starting production this year.

There is a feasibility study into the building of a sugar refinery in Aqaba in connection with establishing sugar plantations in the Jordan Valley, which will be a joint venture with the Cuban government (MEED, January 27, 1995, p.20).

Aqaba's industry is based on the mineral resources of the Dead Sea and the phosphate mines. Jordanians are interested in further development of the industrial sector, but to what extent is unknown. The amount of heavy industry in Aqaba is considerable. As the only outlet to the sea it is an important industrial town, with the Jordanians interested in further development. They are particularly interested in joint ventures with foreign partners who would provide investment funds and long-term export markets (E.I.U, Country Profile 1994-95, 1994, p.22)

6.4.1 Prospects for co-operation

Prospects for industrial co-operation are basically non-existent as far as the Red Sea is concerned. It has to be seen that Eilat is not interested in developing heavy industry. They are interested in developing tourism. The preservation of their side of the Valley for tourism is their major concern.

An ideal compromise between the development of tourism and industry, would be a free trade zone at the Red Sea which was suggested by the Israelis (Government of Israel, 1994). This would include a free port industrial zone, "off-shore banking, tourism and shipping centers - providing investment and employment opportunities". Furthermore, research centres and clean industry such as the high-tech industry would be ideal as the Middle Eastern markets are expected to grow, and the Arava Valley is a land bridge between the east and the west, making it an

ideal location.

6.5 CO-OPERATION IN TRADE

Another area for co-operation would be trade. Krankovsky (1976,p.141) mentioned the possibility of trade agreements between Jordan and Israel which would allow Israel to export industrial products "which Jordan neither produces nor has plans to produce in the near future, and Israel might permit the importation of certain agricultural as well as some industrial products". He also saw that the trade between the two countries would not pick up in the near future and that they have to seek markets outside the region, but he saw possibilities for technical co-operation and co-ordination of export.

According to Rabban (1987,p.6) Israel could export metal, manufactured goods and clothing. However, the World Bank (1994,p.27/28) considers the current potential trade diversion from Jordan to Israel as rather poor. The reasons given are the different capita income levels in the two countries and the consequent difference in consumption patterns. There are few current Jordanian consumer products that would have a large market in Israel. "The most important potential exports are likely to be intermediate industrial goods and some consumer products that can be sold in niche markets by Israeli exporters of final products" (World Bank (1994, p.27).

However, they do see several benefits Jordan would gain from trading with Israel. Firstly there could be a technology transfer from Israel to Jordan. Secondly, the Jordanians could use the network that Israeli firms have built up during the last 35 years through their extensive exporting. "These and other forms of interactions with other economies stemming from co-operation with Israeli firm could provide significant benefits and cooperation

could develop out of it" (World Bank, 1994, p.28)

The Government of Israel (1994) suggested a free trade zone in the Safi region. They believe that free trade zones along border terminals with freight transportation and storage facilities would encourage industrial enterprises to settle in the area.

There are possibilities to co-operate in trade, but the development in that field depends on the potential of the markets in adjacent countries. However, of symbolic importance, trade between Jordan and Israel was opened when the first sample of Jordanian tomatoes were exported by the local Jordanian River Company to Israel (MEED, Volume 38 (48), p.32).

6.6 SUMMARY AND PROSPECTS FOR CO-OPERATION

The prospects for co-operation in industry and trade in the Arava Valley seem to be mixed. Co-operation in potash production seems sensible. Whereas in the Aqaba/Eilat area the kind of industry which should dominate seems to clash. Is tourism or heavy industry the future? In the Arava Valley itself there is no major industrial development so far. The future as far as industrial development is concerned is uncertain, but might be a field for joint ventures between the two countries.

The structure of a joint venture should not be that one country provides the know-how, and the other the labour. There should be real co-operation, with both sides working together to develop the Arava Valley into the Silicon Valley of the Middle East.

Unfortunately, Jordan has only its work force to offer, which is not as highly skilled as the Israeli workforce. This could be changed by establishing joint research and training centres in Aqaba and Eilat. The Arava Valley as the production centre, with the research center in Aqaba/Eilat, could be the industrial future of the region.

As the Israelis remarked, " economic integration would be incomplete without extensive bilateral ties between private firms, not only in commerce but production as well" (Government of Israel, 1994). However, is economic integration between the two countries possible or is it an illusion? The overall economic welfare of both countries can be increased by trade between the two. David Ricardo's comparative cost theory of international trade (1817) asserts that trade between two countries can take place to their mutual advantage, even if one country has an absolute cost advantage in the production of all goods, provided that it has a comparative advantage in the production of some compared to others (Seldon, 1975,p.66/67). Fishelson believes (1989,p.347) that this would overcome the localized absolute shortage of resources in either country. However, despite the economic theory there seems to be the fear of Israeli economic dominance following the peace because of Israel's level of technological development and international contacts (Scudder,1994,p.23).

The prospects for co-operation seem to depend on removing the psychological barriers and apprehension. But trade and economic benefit are good reasons to overcome barriers.

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Chapter 7

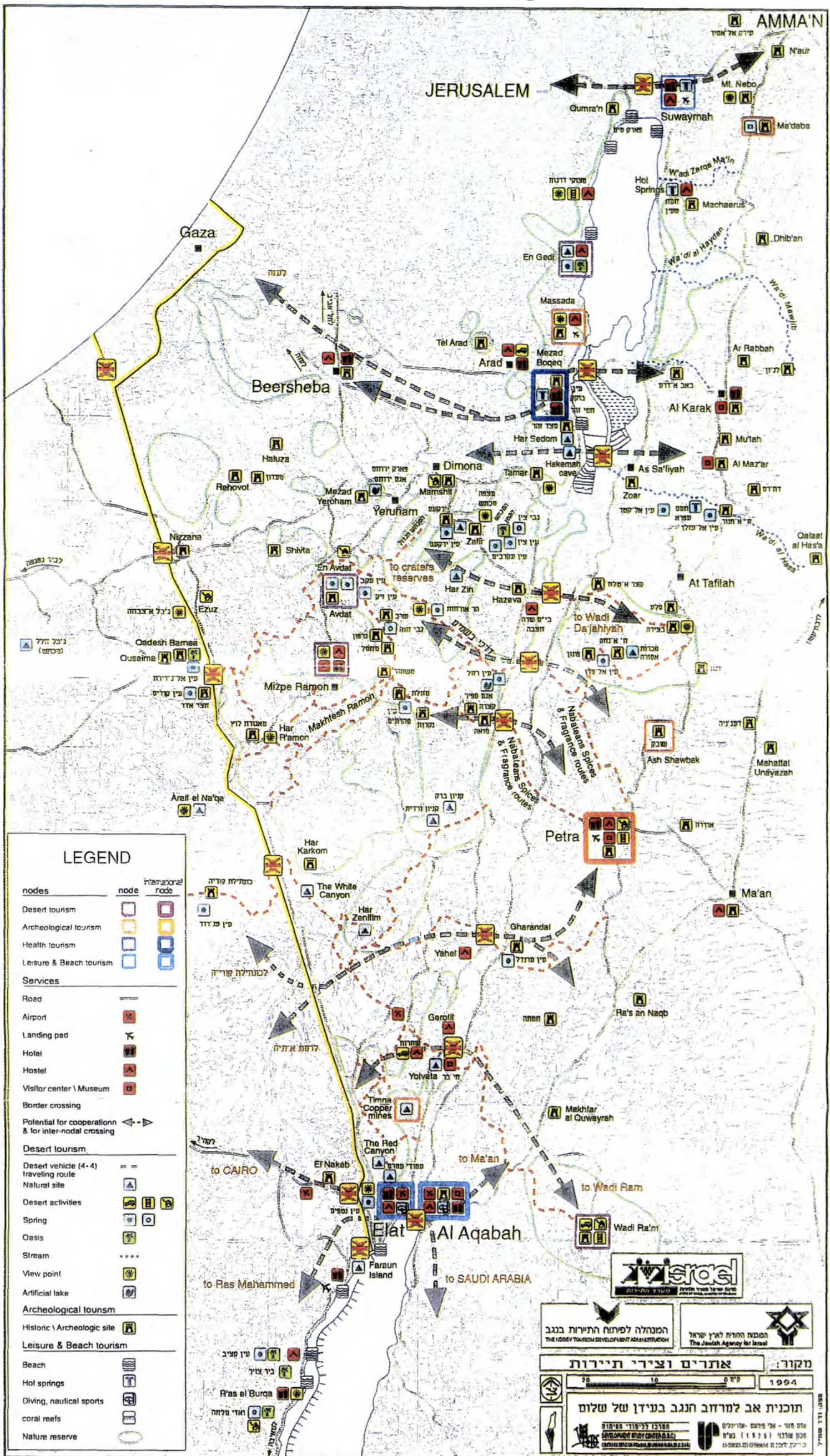
TOURISM

7.1 INTRODUCTION

Krakover (1985,p.272) remarked that "a desert environment that can offer not only rock formation, myths and folklore, but also tours to significant historical and archaeological remains, combined with some sort of water-related leisure activity, has the potential of emerging as a major destination for international tourism". The Arava Valley with its unique physical conditions of the Dead Sea in the north, the Red Sea with its crystal clear water and coral reefs in the south, archaeological attractions such as Masada and Petra, offers the whole range (see Fig 7.1) of attractions a holiday resort can dream off.

Before the peace treaty between Jordan and Israel the tourism potential of the Arava Valley was restricted by the boundary. The idyll of the peaceful and ideal holiday resort was disturbed by the barbed wired fence running across the Aqaba/Eilat shore. Tourists staying in Israel could not visit Jordan or the other way round. With the peace everything changed. On the 8th of August 1994 the first border crossing between Jordan and Israel, 3 km north of Aqaba/Eilat, was opened. Soon afterwards the first tours including Israel and Jordan were advertised in the British Press (Scudder,1994,p.23). Tour operators now offer trips starting off in Amman, then crossing the River Jordan into the Holy Land to visit Capernaum, Nazareth, and Caesarea on the Mediteranean Coast, then returning to Jordan to visit

Figure 7.1 Tourism and border crossing potential



Source: Government of Israel (1994).

Petra and finishing the whole tour with a bathing holiday in Aqaba. At the beginning the border crossing was for third-country nationals only, but since the beginning of 1995 many Israelis can fulfil their long-held dream of visiting Petra.

The free movement of tourists is the present, but the future seems to be the joint development of the tourism potential of the "Arava Valley Region" (see fig Fig 7.1) through intense co-operation between Israel and Jordan. The will to co-operate has already been expressed in Article 17 of the peace treaty.

Although the will for tourist co-operation has been expressed, future co-operation might face some difficulties as both countries developed their tourism independently over the last few decades. The present stage of development, as well as future development plans, differ significantly in each country.

7.2 TOURISM IN THE ARAVA VALLEY

Tourism activity in the Arava Valley and its area is at present concentrated at three sites: the Dead Sea, the Red Sea and Petra.

7.2.1 Dead Sea

Tourism development at the Dead Sea was started by the settlers of the Kibbutz Ein Gedi, which was established in 1953, by offering field trips in the region and then by opening a youth hostel in 1969.

In the 1970's and 1980's the site of En Bogeq, the major Israeli hotel area by the Dead Sea was developed. People mainly visit the Dead Sea resort because of its high

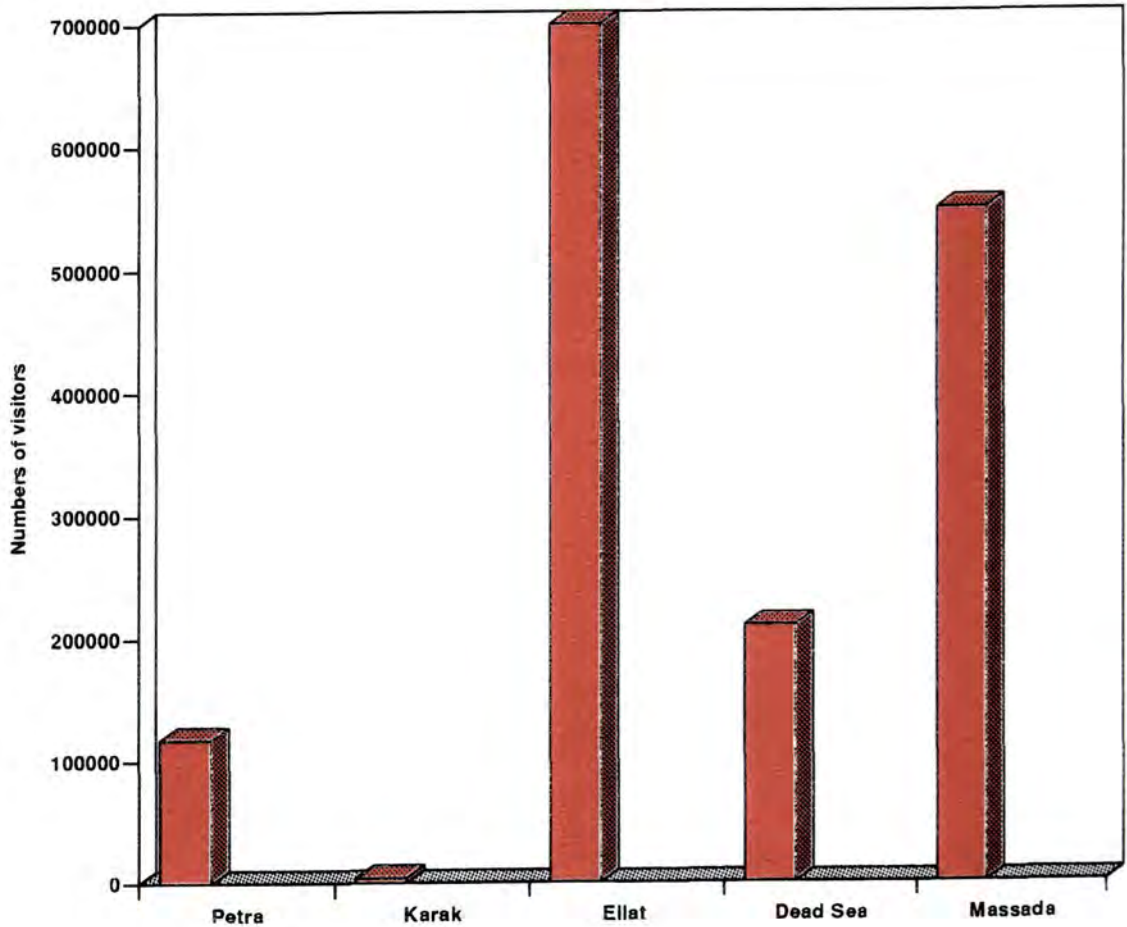
concentration of salts, and with the air screening the sun's UVB rays it enables people suffering from rheumatic and skin ailments to find relief in a spa.

Apart from the Dead Sea, there are other major attractions such as the fortress at Masada. This national Israeli monument stands for the fight of the Jewish people against the Romans in the years between 66-73 AD. After a one year siege by the Romans the inhabitants of Masada committed suicide; Masada fell into Roman hands in 73 AD. Since then Masada has stood for the fight of freedom of the Jewish people. Masada, which can be reached by foot or by cable railway attracted more than 500,000 visitors in 1992 (see Fig 7.2). Another attraction is the Ein Gedi nature reserve which has more than 250,000 visitors a year. Furthermore, there are several biblical places in the region such as Khirbit Qumran where the Dead Sea Scrolls were found between 1947 and 1956. The sporting activities in the region include hang-gliding over the Dead Sea or hiking in the Judean Desert.

In 1993 there were about 1635 rooms in the Dead Sea area in 9 hotels of which 1,500 rooms are high grade (see Fig 7.4). The room occupancy rate was 73.6% (see Fig 7.3), which is one of the highest in the whole country. There are also several camping sites along the Dead Sea and two youth hostels at Masada and Ein Gedi, with about 400 beds altogether.

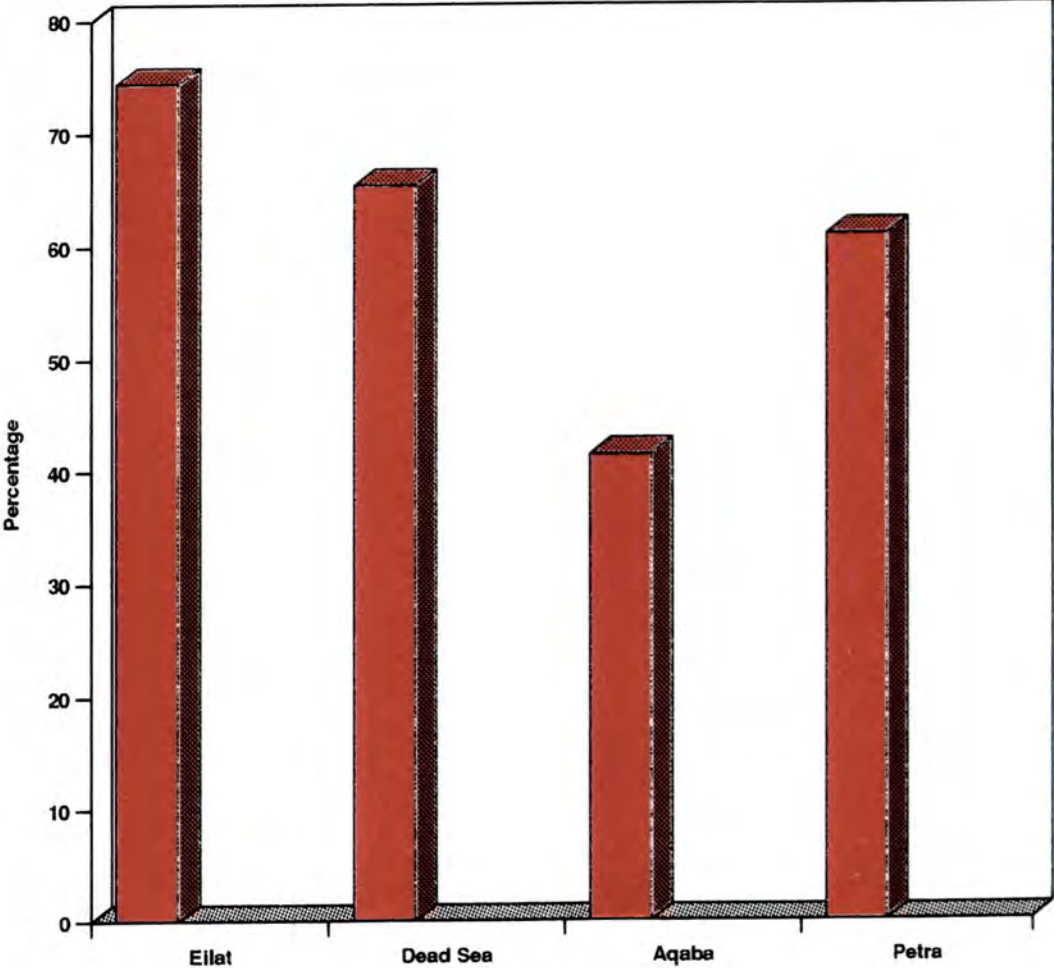
The Jordanians only started to develop their side of the Dead Sea for tourism in the last decade. The development so far only includes one hotel, which does not have any telephone lines (World Bank, 1994, p.33). Despite the fact that the Jordanian side is in some ways more attractive than the Israeli, it stayed more or less untouched until now.

Figure 7.2 Visitors in the main tourist sites of south Jordan and Israel - 1992



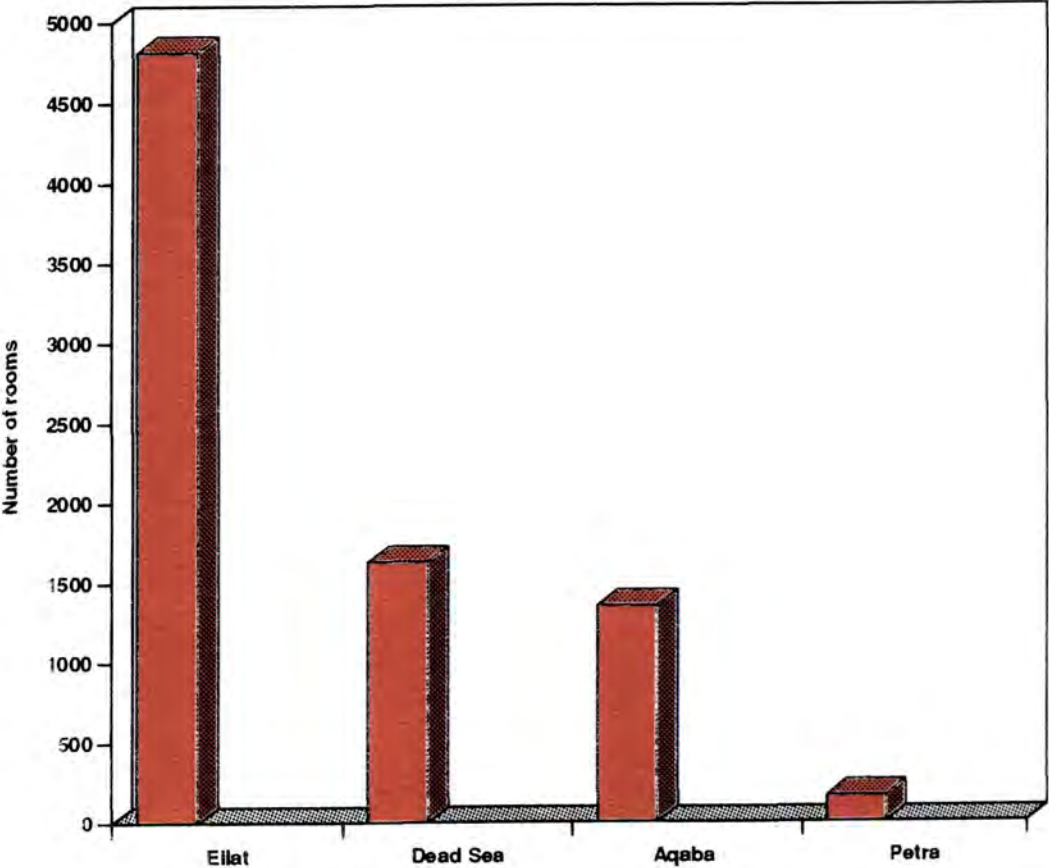
Source: After Gradus, Y (1994), *The Israel Jordan Rift Valley*, Basel Conference.

Figure 7.3 Room occupancy rate in the main tourist sites of Jordan and Israel - 1993



Source: Own draft

Figure 7.4 Number of hotel rooms in classified hotels in the main tourist sites of Jordan and Israel - 1993



Source: Own draft.

Further tourism development on both sides face several problems. The Israeli side of the Dead Sea may have reached its limit for development for several reasons. Firstly, there is the problem with the Dead Sea Works. The Dead Sea Hotels have to share their fossil and brackish water, which are in short supply, with the Dead Sea Works. Therefore, for further development additional water resources would be necessary. One possibility would be to transport it from other regions, but that would be very expensive. Apart from this the Dead Sea works cause another problem: as they pump water from the north of the Dead Sea to the south the water level in the north is constantly lowered, whereas it is rising in the south, which threatens the foundations of the hotels in Ein Boker. According to unoffical sources in Neve Zohar, this particular problem with the Dead Sea works has apparently been settled recently. Details about the settlement were, unfortunately, not available.

There are other problems to be faced. One of them is a shortage of labour. As the region had not been populated by Israel until the 1950's, there has always been an housing shortage. Therefore, "the inhabitants of Neve Zohar, together with other tourist-lobbying pressure groups, are trying to obtain government recognition for the expansion of their settlement to the size of a small urban centre, providing housing and services to people employed in developing tourist resorts in the Dead Sea area" (Krakover, 1985, p.283). The second problem is that fewer and fewer Israelis are willing to work in the tourism industry.

The Israeli side of the Dead Sea faces serious problems which hamper further development of their Dead Sea resorts. There are also interests wishing to stop further development. The Nature Protection Society already saw the limit for further development of tourism reached in the 1980's and therefore, demanded a limitation of visitors to

the En Gedi nature reserve (Krakover, 1985, p.283).

On the Jordanian side different kinds of problems occur. The Jordanians face the problem of a serious lack of infrastructure, meaning that the development will initially be very expensive for the government as the infrastructure is not yet developed enough to attract investors (World Bank, 1994, p.33).

There are major differences in the stages of development of tourism in the Dead Sea area. The Jordanian side is underdeveloped and the Israeli side has arguably reached its limits for development.

7.2.2 Red Sea

7.2.2.1 Eilat

Eilat, Israel's tourist resort at the Red Sea, is currently the largest tourist resort in the Gulf of Aqaba/Eilat. It is also Israel's only tourist resort along the Red Sea coast, which, considering that the entire length of Israel's Red Sea coast is only 11 km is not surprising.

The main attraction of Eilat is undoubtedly its beaches, the coral reefs, the underwater observatory which offers trips in a glass-bottomed boat to experience the fascinating underwater world of the Red Sea, and the diving centre. Diving, swimming, snorkelling and scuba-diving can also be enjoyed at the Red Sea. There are also sailing trips on offer. Eilat offers good services, such as restaurants and souvenir shops. In short, Eilat's tourism is leisure orientated.

There are further attractions in the surrounding area. Firstly, there is the bird watching centre. The Rift Valley

is the most important migratory route for birds in the world: as they make their way from Europe to Africa and back, the birds fly over the Rift making it a prime bird watching site. Secondly, there is Timna, the ancient copper mines which can be visited for a day trip. Then there is the possibility to visit the Sinai with the famous St.Catherine's monastery. There is also the possibility of visiting one of the Kibbutzim.

Eilat is a sea resort with a great variety of local attractions. However, according to unofficial sources at the tourism authority in Beer-Sheba, there are too many hotel rooms in relation to attractions, which means people do not stay for very long. In 1993 there were about 23 hotels with 5,000 rooms in Eilat, mainly located on the north shore (see Fig 7.3 and 7.5). In the year 2000 Eilat is expected to have 12,000 rooms . In 1993 just over 1 million tourists visited Eilat. Its room occupancy rate was nearly 80% (see Fig 7.3), this being the highest room occupancy rate in the country.

The development of tourism in Eilat faces many problems. One of the main problems is the land use conflict with the port. As all the traffic goes through the town there is a considerable amount of noise and pollution which is increased by the airport situated close to the middle of Eilat (see chapter 5). As already mentioned, Eilat is not poor in attractions, but too poor in attractions to attract people for a longer stay. Also, the pressure on the coast increases as the coastal strip is very narrow, with mountains in the east and west rising up steeply (see Fig 7.6). The space for building hotels is very limited. As Beeston (1994, FT, October 13) remarked, "the city is already over-developed and running out of coastline".

The pollution of the sea is one outcome of the dense population along the shores around the Gulf of Eilat/Aqaba.

Environmentalists already protested successfully against the construction of further hotels, with planners now paying attention to the environmental problems caused by the development of tourism. As the coast south of the port is going to be developed great attention is given to environmental protection (Bar-On,1993,p.3). For example, the lights along the promenade to Taba will not face the sea, so the fish will not be affected and irritated.

Figure 7.5 Eilat's hotel area at the north shore



Source: Photograph taken in March 1994

Figure 7.6 Israel's coastal strip south of Eilat - in the background Eilat port, in the middleground the hotel area, and in the foreground on the left is the road to Taba



Source: Photograph taken in March 1994.

7.2.2.2 Aqaba

Aqaba itself is not a tourist resort like Eilat. Although it has a diving centre, Marine Science Station Aquarium, a small museum and Wadi Rum only a half an hour drive away, as well as Petra, it needs more attractions and infrastructure. There are only 1,356 classified hotel rooms in Aqaba (see Fig 7.4), mainly situated in the center or at the north shore (see chapter 5 Fig 5.4). The room occupancy rate was just above 40% in 1993. Most of the hotel rooms are only three star or less. A five star hotel does not exist so far, despite the fact that there is an increasing demand for the 5-star class (World Bank, 1994, p.33).

Figure 7.7 Hotels near the north shore of Aqaba



Source: Photograph taken in March 1994

The tourism industry in Aqaba is not only underdeveloped, it is also in conflict with industry, which until now has dominated the town's development. Tourism and industry have to fight over the limited space available in Aqaba because of the surrounding mountains and limited coast line (see chapter 5). However, compared to Eilat there is a considerable amount of land available along the north shore (see Fig 7.8), which is still in its natural condition.

Figure 7.8 North shore of Aqaba



Source: Photograph taken in March 1994

A plan published in 1987 by the Aqaba Region Authority proposes a large tourist village south of Aqaba (see chapter 5, Fig 5.3). The plan is aimed at both international and domestic tourism, with a maximum capacity of about 2,000 hotel beds and 1,000 chalets (Delegation of the Commission, 1993, p.3.17). So far the construction has not been started, but the report makes clear that with a break-through in the Middle East peace process and the expected improvement in Jordan's economy which will make the tourist zone profitable, the development could start by the year 2000 (Delegation of the Commission, 1993, p.5.9).

7.2.3 Petra

Jordan's most famous attraction, Petra, is about 100 km away from Aqaba and about 262 km south of Amman. There are tombs, houses and temples carved into the multi-coloured sandstone cliffs (see Fig 7.9).

Figure 7.9 Petra



Source: Photograph taken in March 1994

Before the Gulf War in 1990 the number of visitors to Petra was just over 100,000. In 1991 with the Gulf War the number fell dramatically to about 40,000. Since 1991 the

number has increased steadily. In 1992 117,000 visitors came to see Petra, and in 1993 the number reached nearly 140,000 (see Table 7.1). Most of the visitors to the site were foreigners (see Table 7.1). There is already fear that a further increase in tourist numbers might seriously damage the site.

Table 7.1 Number of visitors to Petra during 1989-1993

YEAR	FOREIGN	ARAB	CHILDREN	TOTAL
1989	96,600	17,309	6,429	120,338
1990	83,150	13,624	5,377	102,151
1991	24,375	12,708	3,806	40,889
1992	93,496	19,067	4,784	117,347
1993	110,255	22,275	6,029	138,559
% SHARE 93	79.57%	16.08%	4.35%	100%

Source: Department of Antiquities/Ministry of Tourism (1994), Amman.

With only four classified hotels, with a total of 163 rooms, the accommodation facilities in Petra could be considered as rather poor. To improve this, several hotels are under construction to increase the number of hotel rooms (see Fig 7.9). The room occupancy rate in 1993 was 61.01%.

Figure 7.10 Hotel construction site in Petra in 1994



Source: Photograph taken in March 1994.

7.3 FUTURE PLANS FOR THE DEVELOPMENT OF THE "ARAVA VALLEY REGION".

7.3.1 Proposals by Israel

Looking at the present stage of development of tourism in Eilat, and at the Dead Sea, it seems that Israel has reached its limit for developing them further. They are running out of coast line and resources, such as water. Further increases in the tourism potential could only be reached by increasing the attractions. One major idea is to transform Timna, the ancient copper mine, into a complex of casinos and a hotel at an estimated cost of \$500 million (Scudder, 1994, p.14).

Another possibility to increase the amount of attractions is to include attractions across the international boundary. In their brochure for the Casablanca Summit the Israelis brought up the idea of an

Arava Valley Region. This region would include both the east and west side of the Arava Valley (see fig 7.1). The map (see Fig 7.1) produced by the Israelis is literally cluttered with ideas, and was apparently included in a brochure published by the Ministry of Tourism two years ago to attract foreign investors.

The Government of Israel suggests eight crossing points south of the Dead Sea which would enable tourists to cross into Jordan. Three of the crossing points seem aimed to give access to Petra. Jordan and Israel would thus present one region, where every single potential for tourism would be exploited fully, as the map illustrates quite well. It also shows that there is abundant tourism potential. However, with its arrows crossing into Jordan it somehow gives the feeling of infiltration.

Also in the Israeli brochure for the Casablanca summit, they suggest to punctuate the shores surrounding the Dead Sea with a collection of various types of spas and health centres which offer natural and alternative medicine, such as beauty and diet and anti-stress holidays, with sites offering services for outdoor sports and desert safaris (Government of Israel, 1994). They also recommend developing a string of attractions along a scenic route encompassing the Dead Sea, each of which is a point of interest. Furthermore they suggest an exchange of know-how and co-ordinated planning to implement and manage joint tourist ventures, which would include the creation of a joint data-base for research and study subjects unique to the Dead Sea. The Israelis even go so far as to suggest co-operation in the management and marketing of hotels and other accommodation in the area. Other projects are the construction of an exhibition center and commercial center highlighting products from the area, such as locally produced beauty and cosmetics products, herbs and related health products, organic fruits and vegetables.

As the Arava Valley itself has not been developed for tourism so far the Israelis are also interested in developing its potentials. Therefore they would like to reconstruct the ancient spice route which crosses the Arava Valley. The spice route would include desert inns of a high standard, hospitality tents, overnight camping grounds and toilets. Other routes presented on the map such as the nature and the pilgrim route, demonstrate the potential embodied in the connection between sites on both sides of the Israeli-Jordanian border (see Fig 7.1). Also along the length of these routes it will be possible to develop a range of desert activities such as: walking tours to become acquainted with geology, animals and plants; cliff gliding; donkey trips; hot air ballooning; air flights landing on various sites on either side of the border; stations for research into desert animal and plant life including open exhibitions for tourists, and the possibility of observing animals in the wild.

For the Red Sea the Israelis suggest a common marina, the development of a promenade and the creation of an underwater park to preserve the coral reefs.

The Israelis already have concrete ideas about the transboundary development of tourism. The region's tourism potential seems to have been fully assessed by the Israelis.

7.3.2 Proposals by the Jordanians

The proposals by the Jordanians at the Casablanca summit basically reflect their Five Year Socio-Economic Plan 1986-1990 which outlined the following constraints that the Jordanian tourist industry has to overcome: improvement of the basic infrastructure; conservation and restoration of further sites; environmental protection of all fragile resources; basic infrastructure facilities;

appropriate human resource development and training; appropriate marketing schemes; effective institutions and efficient management and information systems (Ministry of Planning, 1985).

According to the Ministry of Planning (1994) it is planned to develop the tourist capacity in Aqaba, especially in the higher quality hotels. Another 3,000 rooms will be constructed as well as further sport and recreational facilities. In Petra the construction of new hotels with a total capacity of 1,000 rooms is planned, and at the Dead Sea the construction of a new hotel with total capacity of 150 rooms is planned, along with new therapeutical clinic facilities.

The government's efforts towards developing tourism is focused on prominent tourist sites such as Aqaba, the Dead Sea and Petra. However, transboundary co-operation with Israel is not mentioned in the Casablanca report.

7.3.3 Summary

Ash (1994, p.2) remarked that "for Jordan the priority is domestic development; whereas Israel is looking at wider horizons". Projects by the Jordanians are laid out in detail and are carefully costed; many of them are already at the advanced planning stage. However, as an outcome of the Casablanca conference and following the peace treaty joint projects are under consideration (Ash, 1994, p.4) in the Red Sea Riviera, which is the joint development of the resort facilities in Aqaba and Eilat. For example, the two towns would be linked by a promenade. Also, a transnational underwater coral reef park is planned in the Gulf of Aqaba/Eilat; the lowest park on earth situated around the Dead Sea. This park would include hotels, exhibition sites and health centres.

7.4 GENERAL CONSIDERATIONS FOR THE DEVELOPMENT OF TOURISM IN THE "ARAVA VALLEY REGION"

7.4.1 The economic importance of tourism

The importance of developing tourism for Israel and Jordan should not be underestimated. As both countries are confronted with strong population growth, Israel through immigration and Jordan through a birth rate which is over 3 % per annum, economic growth is the basis for economic and social development. Without economic and social development the two countries could face political instability. Already tourism is a very important source of income for them. Israel earns about \$2 billion annually which is the equivalent to about one sixth of its industrial exports; in 1992, it amounted to about twice the current deficit of the balance of payments (Carney, 1992, FT, 7 December, p.13). Jordan's tourism industry is smaller only earning an estimated \$ 546 million in 1993, coming second in earnings to other export inflows. However, as Burkart (1981, p.66) remarked, tourism may provide a stabilizing influence on the country's export earnings.

As it is generally agreed that tourism pushes the economic development of countries very fast, it is seen as an agent of economic development (Burkart, 1981, p.65; Lea, 1988, p.50; Shaw, 1994, p.116). Therefore, it would be the ideal medium for stimulating economic growth in Israel and Jordan. The tourism industry is already an important part of the national economy but its importance might increase tremendously in the future.

Looking at the importance of tourism at a regional level, its importance for economic development might even be more significant. There are several examples of the development of tourism in Europe, especially in the Mediterranean, where the tourism industry helped to

develop regions lacking in infrastructure. Mathieson (1982) and Burkart (1987) agree that the impact of tourism on the development of an area can be very rapid. One of the most

famous examples is probably the Spanish coast. Furthermore, they mentioned some other interesting characteristics of tourism: traditionally tourism is concentrated in less urbanised areas; tourism can be developed in a short time-span, and with only moderate levels of investment; tourism is also a major source of employment at the local level. Tourism is a very "labour intensive industry, which is particularly valuable in areas with surplus unskilled labour" (Burkart 1987,p.65).

Taking all this into consideration it seems very understandable that governments invest huge amounts of money to develop tourism. The Israeli government is, therefore, channeling considerable investment into tourism, targeted mainly at three main locations: Jerusalem, the Dead Sea and Eilat on the Red Sea (Carnegy,1992,FT,7 December,p.13). It is also interested in transboundary co-operation.

7.4.2 The social,economic and environmental impact of tourism

Looking at the social and economic impacts of tourism on the Arava Valley region there is no doubt that tourism will change the life of the people living there. People will get involved with tourism through working in the sector, or because at least one person in the family earns their living from tourism. Tourism will certainly change the life of the bedouins in Petra and in the Arava Valley. What is left of their traditional lifestyles will be destroyed. People will work in the tourism industry learning the values of the visitors. This process has happened in other resort areas around the world

(Mathieson,1982,pp.143ff). Therefore, there is the demand that peripheral destinations should plan a sensitive and broad-spectrum process of tourism development, to reduce the trade-off social costs (Bar-On,1993,p.25).

Furthermore, the waste created by tourists, the traffic and all the other outcomes might destroy the area. Mass tourism is well-known for destroying the environment. As Shaw (1994,p.184) remarked "large numbers of tourists in small areas creates intense environmental pressures". The Mediterranean coast or the nearby Red Sea Resort of Egypt (Nuweiba) are probably the best examples. In Nuweiba the waste already causes serious problems (Key, 1994,p.38/39). Also, there are studies by the Israeli Antiquities Authority about the potential ecological disaster of a tourist boom in the southern Negev.

The coral reefs south of Eilat and Aqaba are already threatened with harm. On the Israeli side, the coral reefs are threatened because of the tourism development along the southern part of the coast. The Jordanian side is threatened because the area south of the Marine Science Station, where the coral reefs are situated, is proposed as a tourist area. Further along the coast industrial and military developments are planned. The fertilizer plant at the border to Saudi-Arabia, the port activities as well as the oil terminal with possible oil-spills, all threaten the coral reefs in the Gulf of Aqaba/Eilat (Wells,1988,p.139/147).

Despite all these disadvantages, tourism will bring economic development, with wealth coming to the inhabitants of the area. However, there will only be a long-term wealth if the tourism potential is exploited carefully, and providing that the environment is still intact. As the report by the Delegation of the European Commission (1994,p.5.4) made clear, to attract tourists

clean water is necessary, intact coral reefs and high air quality.

7.5 PROSPECTS FOR CO-OPERATION

The fact that the protection of the environment is essential for further development of tourism in the Arava Valley has been recognised by both Jordan and Israel. The peace treaty outlined co-operation in the environmental management of the Gulf of Aqaba/Eilat.

Projects for protecting the environment discussed at the Casablanca Summit include, as already mentioned, international nature reserves, both above and below water, which will provide the framework for co-ordinating action concerning the development and preservation of the area. As Bar-On (1993,p.24) stresses, that for optimal development of the Coral Nature Reserve increased co-operation with Israel's Red Sea neighbours is required.

The present two marine parks could be extended to cover the entire Gulf of Aqaba/Eilat. This park on the borderline could mark the beginning of fruitful co-operation, and have the functions and values defined by McNeil (1990,p.25) for an international park: "the promotion of peace; protection and management of resources and environments; preservation and enhancement of cultural values, especially the protection of transboundary people". There are, according to Thorsdell (1990,p.5), many examples where parks on the borderline, in their own small way, can stimulate co-operation among nations. There are border parks all around the world: there is a border park between Panama and Costa Rica, Buthan and India, Italy and France; but there is not one in the Middle East. A border park in the Arava Valley and an underwater park in the Gulf of Aqaba/Eilat would be the first two borderparks in the

Middle East.

In the case of the Arava Valley and Petra, the cultural values of the bedouins would need to be protected.

Furthermore, the migratory birds which use the Arava Valley on their way to or from Europe also need to be protected, as well as other wildlife of the Arava Valley and the Red Sea.

Ceballa sees eco-tourism as one option to fulfill the function and values McNeil defines. He defines eco-tourism (1990,p.54) as, "tourism that consists of travelling to relatively undisturbed or uncontaminated natural areas with the specific purpose of studying, admiring, and enjoying the scenery...as well as any existing cultural manifestations located in these areas". He also sees a considerable potential in eco-tourism for generating foreign exchange. One example where an international border park has been created is La Ruta Maya, which covers Mexico, Guatemala, Belize and Honduras. This park includes archaeological sites, beaches and wildlife. However, until now only preliminary work has been done and there is still a long way to go to realise transboundary eco-tourism. However, the basic idea of La Ruta Maya could be applied to the Arava Valley Area or at least be considered as a sustainable alternative to mass tourism.

Through co-operation it will be possible to identify and create a framework for development which will enable the region to compete successfully with holiday resorts around the world. The problems mentioned above such as water shortages and pollution could be addressed jointly. This would also include common management of the social and environmental impact of tourism in the area, which is already an urgent matter because of the number of tourists from Europe and the US to Jordan, which rose from 160,400 in 1992 to 203,00 in 1993 as a result of the peace process.

With the prospect of further increases in the coming years, a greater environmental impact on the sites can be expected, especially around Petra where 2,000 extra hotel beds are going to be created in the next two years. The problems arising from this such as the provision of adequate water supplies or traffic management are already taken up at cabinet level in Jordan (Dougherty,1994,p.14). This shows that the pressure of tourism on Petra already increased before the opening of the border, but now with the open borders and the increasing number of day tourists from Israel, the situation seems to be critical.

For Petra to survive, and in order to protect this unique attraction the Israelis and Jordanians must co-operate. For example, quotas for day tourists coming from Israel could be agreed. Conservationists from both countries could work together to guarantee the protection of Petra. Plans by the Israelis to make Petra more accessible by building some travelling routes for desert vehicles (see Fig 6.1) should be abandoned, because of the environmental impacts on Petra and the desert environment. Scenarios of thousands of desert vehicles arriving in Petra every day are rather frightening.

The prospects for co-operation and the projects mentioned above seem to be promising, if there were not the worries by the Jordanians that they are being left behind by their neighbour's tourist boom (Carnegy,1992,FT, 12 November,p.36). Before the peace treaty there was the fear that Jordan was becoming little more than a day trip from the Israeli Red Sea resort of Eilat and the neighbouring Egyptian resort of Taba. However, Krankover rather sees the Jordanians gaining from open borders; he remarked (1976,p.137) "it requires no stretch of the imagination to conclude that open borders allowing and encouraging tourism from Israel would increase Jordan's tourist income very significantly". However, only nine

months after the signing of the peace treaty the fear of the Jordanians seems to have come true. "The boom in Israeli tourism has meant little more than Israelis making a dash to Petra, taking their own food with them" (Economist, 4 March, 1995).

This is mainly because of Israel's better hotel facilities. Jordanians and Palestinians know that only by co-operation will the tourism in the region increase significantly. However, at the moment it seems that the Israelis are ahead in planning and the Jordanians seem to be nervous about it. As Helm (1994, p.14) put it: "knowing that Israel and its business backers are ahead of the game, they are nervous about a takeover." One proof that justifies their fears is probably the Casablanca brochure.

The Israeli brochure for the Middle East and North Africa Economic Summit was orientated towards regional co-operation (see Fig 6.1). The Negev Tourism Development Administration had already printed "The Negev Peace tourism Potential" in July 1993 and "The plan for the Negev Development of Tourism in the Negev 1992-1997" in November 1993, a brochure which was sent to potential foreign investors. Whereas the Jordanian brochure on the other hand only stuck to their Five Year Economic Plan 1986-1990. It leaves a feeling that the Israelis are ahead, but what is needed is co-operation, not a take over.

There are prospects for future co-operation, though the question which has to be answered now is: Which way to take? Should the potential of the "Arava Valley Region" as an international tourism destination be developed to its full extent, or should other alternative forms be considered such as ecotourism? As Butler (1993, p.46) argued, "to achieve successful tourism development of a type and scale appropriate to a frontier region, it is necessary to ensure that certain basic issues are

involved". First of all the nature of tourism needs to be understood by all parties: local residents and decision makers. Secondly, the type and scale of tourism should be compatible with the frontier region. Thirdly, the limits of the physical and socio-economic environments should be taken into account. Fourthly, control must be maintained on the development of tourism.

Altogether, "integration with existing land uses and the resource base is essential for the long-term well-being of tourism and other economic activities in the frontier regions" (Butler, 1993, p.46). Therefore, tourism development should be considered carefully, with the profits staying in the region. Only by the joint development of the potential where both sides are equal, will transboundary co-operation be successful. Otherwise there will be a tourism boom with the peace, but as the World Bank (1994, p.33/34) suggested, the most likely scenario is that Jordan will have a limited share of it. Jordan may be confined to day trips, to visit the recreational and archaeological sites. Furthermore, the environmental impacts mentioned above might come true. Under these circumstances the prospects for a fruitful transboundary co-operation in terms of tourism are not encouraging.

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Chapter 8

CONCLUSION

The Arava Valley is a single natural unit, yet it has been separated by 40 years of differential development. The 180 km long international boundary led to the development of two contrasting borderlands. The Israeli side is mainly populated by Jews, concentrated in Eilat or in the Kibbutzim or Moshavim in the Arava Valley. Their agriculture is highly developed and provides a high standard of living; the tourist sector is the main industry in Eilat and in the Dead Sea region, apart from the important Dead Sea Works.

The Jordanian side is inhabited by Arabs, concentrated largely in Aqaba or Safi. There are also bedouin living in the Arava Valley. Some of them are living in recently established villages in the Arava Valley itself, earning their living from farming. The Arab farmers in the Arava Valley are some of the poorest in Jordan. Heavy industry is to be found in Safi and Aqaba. Aqaba's main economic activity is the port and the fertilizer industry. Tourism, apart from the famous site at Petra, plays a minor role on the Jordanian side of the Arava Valley.

However, there are common features between the two borderlands. Both sides of the Arava Valley are thinly populated, with the exception of the Red Sea Coast (Eilat and Aqaba) and Safi. Both sides of the Arava Valley are also far away from the core areas of their countries. The development of Eilat and Aqaba have been strongly influenced by the geopolitical situation at the head of the Red Sea and in the Middle East.

With the signing of the peace treaty on October the 26th 1994 the need for transboundary co-operation has officially been recognised by both countries. Projects for co-operation have been suggested and are under consideration. Indeed there is evidence that informal discussions have been under way for some years. Altogether the prospects for future transboundary co-operation seem to be promising, although in some sectors the problems may have been under-estimated.

The prospects for transboundary co-operation in water are good, as there are no alternatives to a shared water system. Jordan and Israel have either to co-operate or they will both lose more than they can afford. Investigations to assess the amount of water available in the Arava Valley will have to be done jointly. As a first step, a joint water authority in Aqaba/Eilat should be established which would be in charge of the distribution of the common water resources across the boundary.

Transboundary co-operation in agriculture depends on the generosity of the Israelis as well as on the pride of the Jordanians. Are the Israelis willing to give their knowledge for free, and if not, what is the price? Are the Jordanians too proud to admit that their agriculture is far less developed than the one on the Israeli side? Prospects for co-operation in agriculture exist, but if the projects suggested are going to be realised much will depend on the general development of agriculture and water availability. However, a first step towards transboundary co-operation has been made already. With the return of Jordanian territory the question emerged what would happen to the al-Ghamr farm, which was seized by the Israelis between 1968 and 1970 and the land occupied by them in the Arava Valley. In the peace treaty it was agreed that Israel has to return the land, but "as a gesture of goodwill towards Israel, it was agreed that the Israelis could continue to use it

conditionally for up to 25 years under Jordanian sovereignty" (Jordan Media Group, 1994).

Transportation infrastructure is, together with water, one of the most important areas for transboundary co-operation. At present the systems duplicate each other, and are costly to maintain. The integration of the two transportation systems would save both countries considerable investments. It would also lay the foundation for developing an inter-regional and international transportation system in the Arava Valley, which would connect Egypt with Jordan and Saudi-Arabia, via Israel.

The prospects for transboundary co-operation in industry are less certain. The two countries are competitors on the world market for potash and phosphate; and no competitor gives away its market advantage, but some rationalisation may be possible.

The tourist sector has already profited from open borders. Unfortunately until now the Israelis seem to have gained most from it. It is no wonder that the Jordanians are apprehensive about transboundary co-operation on the basis of this experience.

There have been many projects suggested for co-operation by the Government of Israel but few by Jordan, although it needs more than political will to realise them. Transboundary co-operation requires the will of the people living in the borderlands. They are the ones who have to live with these projects and with the political reality, and the commitment of local people especially in Jordan, must be questioned.

In the case of the Israeli-Jordanian borderlands the politicians in Jerusalem and Amman took the decision to co-operate. For the Jordanians the peace was a big surprise.

According to an article in the Economist (4 March 1995) the Jordanians are not particular happy about the terms of the peace agreement, negotiated by King Hussein without much consultation with anybody else. Also, they do not like the idea that Jordanian territory has been leased indefinitely to Israeli farmers who were cultivating it in the past, and that there has not been a significant increase in Jordanian tourism since the peace, unlike in Israel.

The Israeli government departments had already worked out the plans for transboundary co-operation long before the Jordanians had contemplated peace. The events have overtaken the Jordanians and that is one reason why they are not geared up for co-operation. There is even an underestimated fear in Jordan that they will lose-out with the open borders.

The phenomenon that one country fears to lose because of open borders is wide-spread. Matar (1994,p.28), for example, argues that open borders between Israel and Jordan would be a financial disaster for Lebanon as its economy is much weaker than Israel's and the goods produced in Lebanon could not stand up to the competition. However, to prevent this, efficient transboundary co-operation is even more essential. There is no doubt that to achieve successful co-operation both sides need to profit from it, because only then will people believe in transboundary co-operation.

Anderson (1994) gives the example of transboundary co-operation between Northern Ireland and the Irish Republic. There, as in the Arava Valley, a duplication of transportation infrastructure is to be found. With the peace process the sharing of integrated facilities is on the agenda. Instead of happiness about sharing, there is now competition about where the shared facilities are going to be located, in Northern Ireland or in the Irish Republic. Derry and Letterkenny, for example, are

competitors for the location of a North-West regional airport. Anderson (1994,p.61) stresses the point that "any general rationalisation programme for Ireland as a whole, would involve conflict over closures and job losses as well as competition for the location of new facilities, new investments and new jobs". Even in agriculture where the co-operation between the two countries is relatively advanced, there are fears of competition from the Irish Republic as they possess a recently restructured dairy sector and larger food-processing conglomerates (Anderson,p.61). The case of Northern Ireland and the Irish Republic illustrates how difficult it is to integrate transportation infrastructure as national interests are still considered to be more important than transboundary co-operation. As Anderson (1994, p.61) put it: "integration is a 'two-edged sword' strengthening Irish competitiveness against external competitors, but increasing competition as well as cooperation between North and South, and producing losers as well as winners". This might well also apply to the Arava Valley.

Another interesting case is the German-Hungarian border illustrated by Lopow (1994). The prosperity gradient between Germany and Hungary led to German citizens going to Hungary to get their teeth fixed, or to go to the hairdresser or to buy goods, which are extremely cheap compared to Germany; Sopron, a Hungarian border town, has an unusually high percentage of dentists and hairdressers. The market and the service industry is used by thousands of German tourists daily, who take advantage of the prosperity gradient (Lopow, 1994, p.43).

A similar case is the border between Poland and Germany. The two border cities of Lekkica (Poland) and Bad Muskau (Germany) are connected by a bridge over the Neisse. After the reunion of East and West Germany Lekkica became the biggest trading centre at the gateway of the EU.

Leknica has a market with a labyrinth of kilometres of stands. In 1993 11 million border crossings were counted and the market has a turnover of more than 400,000 Pounds Sterling on a good week-end (Gaserow, 1994,p.28ff). The problem is that the market in Poland is booming, whereas the markets in Bad Muskau are declining. People in Bad Muskau complain that they get the traffic and the pollution. They would like the Polish market to disappear. Any attempts to work together to solve the transboundary traffic and the flow of shoppers to Poland has been unsuccessful for several reasons. First of all, the Polish people are not interested in stopping the markets as it means prosperity for them. Secondly, the co-operation between the two administrations is difficult as the structure is different, and because of the language barrier. Another reason is financial; on the German side money for the German-Polish understanding is provided by the government and by EU sources, whereas on the Polish side there is no money available for transboundary co-operation (Gaserow,1994,p.31).

The examples given so far are all along boundaries which have been opened recently, or became more open. They all illustrate that the integration of two different economies can cause problems. Very often it brings advantages for one side and only disadvantages for the other side. In all the cases mentioned above transboundary co-operation is evolving. In some cases, such as the Northern Ireland and Irish Republic, the EU funds are of additional help to assist transboundary co-operation.

The early stage is always the most difficult part. With the right start the situation in these borderlands may normalize over time. There is no doubt that in the long-term there could be advantages for both sides in the Arava Valley. Klemencic (1982, p.66ff) remarked that "we live at a time when we can speak about the need to co-ordinate the

cross-border planning and the development of border regions as determined by the wish to satisfy the needs of the population on both sides of the border". Transboundary co-operation in Western Europe and in North America are the best proof.

The borderlands in Western Europe and North America are not economically disadvantaged anymore. Hansen (1986) stresses that by peaceful international political relations and increasing international integration the situation in the borderlands improves. He remarks that "the interdependent development of neighboring border regions requires local and regional transborder cooperation in order to address effectively social, economic, and environmental problems that spill over international boundaries" (1986,p.31). He gives the example of the Alsace. Twenty years ago the French literature about co-operation saw more disadvantage in transboundary co-operation than advantages, as the Alsatian economy is the weakest in the region; Germany and Switzerland are economically stronger. However, in reality the Alsace benefitted from the economic proximity to these areas. Today it is one of the most prosperous parts of France.

These positive developments in the Western European and North American borderlands took time. The transboundary co-operation between the USA and Canada started a hundred years ago, although the boundary is much older and there have always been strong cultural links between the two countries. However, today this is one of the most outstanding types of co-operation in the world. The most important interactions are not between the national governments but between sub-national government units, private organizations, and individuals (Alper,p.121). The State of Maine has established an Office of Canadian Affairs. The institutional structures for handling relations with neighboring provinces in both the executive

and legislative fields has the advantage that sub-national government units have access to each other, and can solve transboundary matters without the national government.

In Europe the importance of transboundary co-operation between border communities has been officially recognised by the Western European governments by signing the European Outline Convention on Transfrontier Co-operation. Therefore, it now seems to be natural that there is institutionalised transboundary co-operation between many countries in Western Europe.

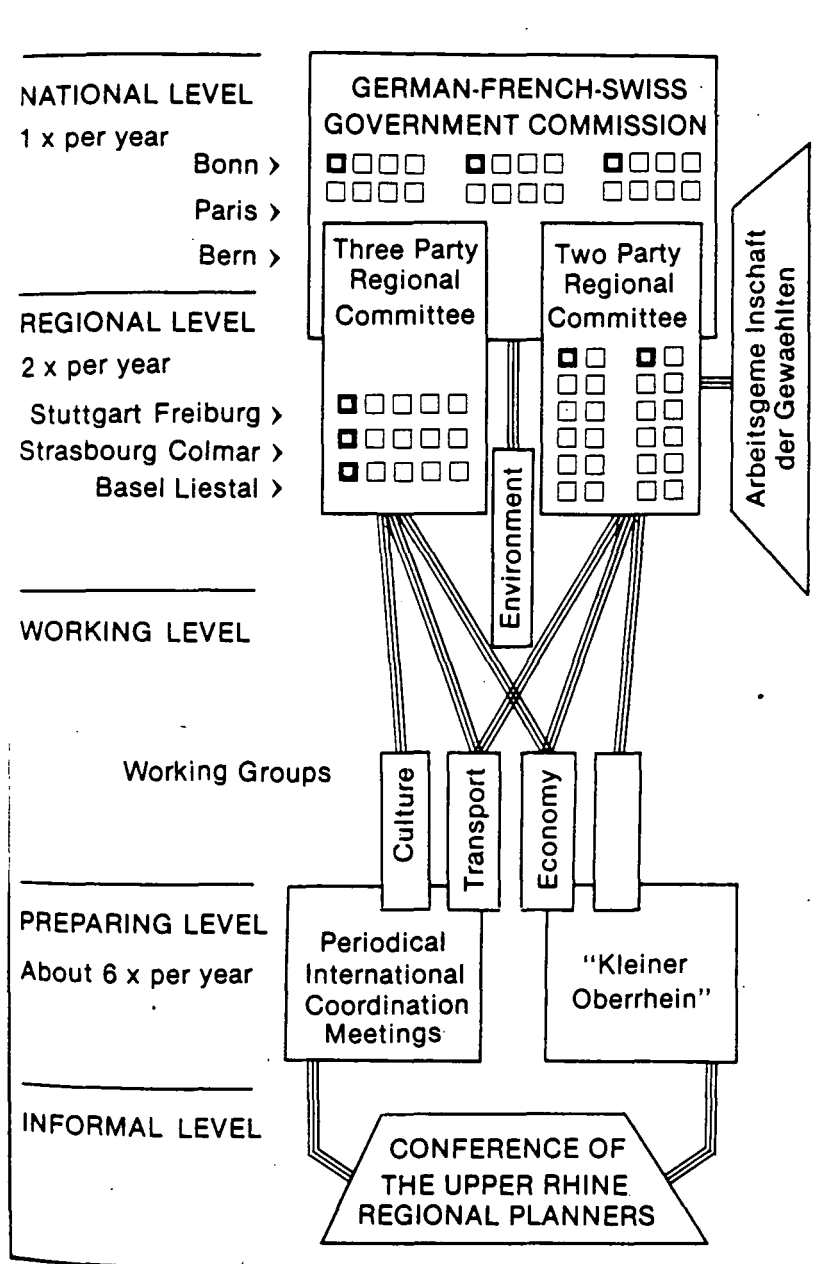
There is for example, the "Euregio Mass-Rhein" transboundary working group. The region includes parts of southern Netherlands, parts of Germany and Belgium. Their aim is to co-ordinate the transboundary co-operation on the regional and local level, solving the transboundary problems concerning the environment, the infrastructure and the economy in the region. Another example is the Saar-Lor-Lux-Region, between the Bundesland Saarland, Lorraine (France), Luxemburg and the parts of the Bundesland Rheinland-Pfalz.

One of the best examples for transboundary co-operation is the Regio Basiliensis. The Regio Basiliensis started off in 1963. There were metropolitan co-ordinating and planning bodies involved, also industry, three local universities, and the local governments took part. At the beginning conferences were held where planners, politicians and scientists discussed regional planning models (Briner, 1986, p.47). The transfrontier co-operation which developed over the last few decades is as follows (see fig 8.1). There are working groups, consisting of people from France, Germany and Switzerland, concerned with tourism, energy and other subjects which are of concern for the region. For example, transportation is a problem for the region as there is a great number of commuters. There needs to be

sufficient transportation infrastructure to meet this need. The Commission at the top takes the results of these working groups into consideration to develop recommendations. The Commission is also able to prepare draft agreements. A significant amount of work is done at the periodical international meetings which are held up to seven times a year and attended by representatives of the local planning regions. It can be seen that people from all levels are involved and the decisions about what is going to happen in the region are carried out jointly. Briner (1986, p.53) stresses that "up to the present time a genuine three-sided willingness to undertake a true partnership in the regulation of conflicts in the Basel Region has been missing at the national level - at least in matters such as environmental and energy issues; the initiative for cross-border co-operation therefore tends to come mostly from the regions themselves".

Could this model be applied in the Arava Valley? The Regio Basiliensis has some common characteristics with the Arava, but so do the US-Mexico borderlands. For example, the US-Mexico borderlands and the Regio Basiliensis are characterised by the following (Hansen 1986, pp.38ff): reflection of past conquests and diplomatic arrangements more than of natural geophysical barriers; zones of actual or potential military conflict throughout much of the 19th and 20th century; within their national settings, the border regions are relatively distant from their respective capital. These characteristics probably apply to 90% of Europe's boundaries. However, 50 years after the Second World War transboundary co-operation has replaced these old conflicts.

Figure 8.1 The Regio Basiliensis - a model of institutionalised transboundary co-operation



Source: Briner, A. (1986), p.51.

However, the Arava Valley borderlands do represent a sharp demarcation between border area cultures. Also, the degree of disparity in living standards is very significant, like the one between Mexico and the United States. Martinez (1986, p.201ff) believes that disparity in living standards causes the major problems between the US and Mexico and believes this is why they have been unable to tackle problems effectively. Americans feel threatened by the immigrants, and as long as the economic and demographic gap prevails, it will be difficult to reach agreements on meaningful joint border programs. He sees more chance of creating the kind of organisations existing in Europe as soon as Mexico's economy improves. He (1986, p.202) stresses that "for a border region to flourish, people who live in the area must not be impeded from crossing back and forth from one country to the other, and a reasonable amount of trade must be permitted to take place".

Probably the most interesting example of adjacent borderlands and their development of transboundary co-operation over more than a decade, lies in the neighbourhood of the Arava Valley, the Egyptian-Israeli borderlands. Sixteen years ago on March the 26th 1979 the Egyptian-Israeli peace treaty was signed at Camp David. The major thrust of the peace treaty was that Israel and Egypt agreed to move towards normalization of relations. The peace treaty includes articles concerned with their diplomatic, economic, and cultural relations. Furthermore, freedom of movement is mentioned, "neither party will impose discriminatory restrictions on the free movement of persons and vehicles from its territory to the territory of the other" (The Department of State, 1979, p.17). Also, the co-operation for development and good neighbourly relations as well as transportation and telecommunications was agreed.

A protocol concerning relations of the parties contains a paragraph where the parties agreed the following: " The Parties further agree that a highway will be constructed and maintained between Egypt, Israel and Jordan near Eilat, with guaranteed free and peaceful passage of persons, vehicles and goods between Egypt and Jordan, without prejudice to their sovereignty over the part of the highway which falls within their respective territory" (The Department of State, 1979, p.18).

However, as promising as the peace treaty sounded, its basic message was not transboundary co-operation, it was normalization. "The 'normalization' as stipulated in Article 33 of the treaty's preamble, provides for 'full recognition, diplomatic, economic and cultural relations, termination of economic boycotts and discriminatory barriers to the free movement of people and goods..'". (FMA,1985).

However, looking at what actually happened after the Egypt-Israel peace treaty is not very encouraging. Soon after the peace treaty the normalization process was disturbed for two reasons. Firstly, because of the Israeli's handling of the settlement issue in the occupied territories. Secondly, because there was a growing reservation towards the Israelis by the average Egyptian; with the boycott by the other Arab states, Egypt was very isolated and the Israeli tourists did not bring enough money to compensate for the rich Arabs. Altogether, as far as telecommunication, and air-links, as well as diplomatic relations were concerned things worked out, but no transboundary co-operation in the sense of joint projects was developed.

Shamir (1988, p.202) remarked: "The opening of the borders between the two countries was an exhilarating experience for a society that for thirty years had been

living in quasi siege". However, the reality a decade after Camp David was that oil, the biggest trade item between the two countries, became less and less important as a trade item because the oil price on the world market was cheaper than the one agreed between the Israelis and Egypt. Israel could purchase oil for a much lower price on the world oil market.

The transboundary flow of tourism was also disappointing for the Israelis. Between 1980-87 300,000 Israelis travelled to Egypt, which is an average of about 35,000 year, whereas only 2,000 to 3,000 visitors from Egypt visited Israel per year (Shamir, 1988, p.202). That there has not been transboundary co-operation in the past 16 years has to be seen in the terms of political situation in the Middle East over this period. " There is little doubt that uncertainty about the future of political relations, which stems from lack of progress on the Autonomy issue and the refusal of other Arab countries to join in the peace process, inhibits further expansion of Egyptian-Israeli economic relations and prevents them from reaching what might be termed their 'natural level'" (Arad, 1983,p.135).

However, with the peace treaty between Israel and Jordan as well as further progress in the overall peace development in the Middle East, Egypt seems to be interested in joint transboundary projects. In their brochure for the Casablanca Summit, transboundary co-operation with Israel on transportation and tourism are high on the agenda. For example, they suggest (Government of Egypt, 1994, p.51) the expansion and development of Ras Al-Naqb Airport to become a multinational airport. The airport is situated in the Sinai close to Eilat and Aqaba. It would, therefore, serve future tourism markets in Egypt, Israel, Jordan, and Palestine. There is no doubt that a mutual interest of transboundary co-operation is shared by

the Egyptians. There might not have been transboundary co-operation in the past, but there will be in the future.

The transformation from an alienated borderland such as the Arava Valley, to a co-existent or even integrated borderland is going to be painful. The opening of the Inner German frontier, for example, is one of the most recent cases where this happened. Sealed for fifty years the frontier was suddenly opened. The positive effects were that the rail links and infrastructure were rebuilt, the negative effect was that the traffic increased. As Jones (1994a,p.265) remarked, "this led to an enormous upsurge in road traffic onto systems which had been developed for more modest local needs". This case could well happen in the Arava Valley. Other impacts are the increase of tourism, the extra demand of housing, and the improvement of the infrastructure. In the German case there was a large increase in employment within the frontier districts and an upsurge in economic activity. But on the other hand, there was increasing congestion, additional environmental problems and rising costs of goods and housing accomodation (Jones, 1994a, p.270).

Jones and Wild (1994a, p.262) remarked that in the case of the removal of a political boundary such as the Inner-German boundary, there is an absence of substantive case studies to draw upon. They try to identify the economic and social impacts of the opening of the border on the localities and communities of the frontier zone. After studying the socio-economic gradients across the Inner-German states, Jones (1994b,p.233/234) reached the hypothesis "that the removal of the frontier did not generate positive short-term economic impacts on the majority of districts on the western side, to overcome the cumulative negative effects of retardation and stagnation caused by four decades of existence as a relatively unfavoured border zone".

What is going to happen when the boundary in the Arava Valley becomes permeable ? Authors like Asiwaju (1991) believe that the European Convention for Transboundary Co-operation, which formalises and legalises transboundary co-operation is the ideal model, but this remains to be seen. Even if that model is recommended for Africa by Asiwaju and by Hansen for the US-Mexico borderlands, it has to be accepted that every continent, and in particular every borderland, is unique.

Transboundary co-operation cannot to be started by imposing a model. The beginning of transboundary co-operation should start off with transboundary co-operation concerning the natural resources. There are many examples in the world where countries co-operate successfully in these matters without having conventions. One very interesting example is the Mekong River Basin. In 1957 the Mekong Committee was established to co-ordinate the Mekong River Basin which is shared by Cambodia, Laos, South Vietnam and Thailand. Transboundary co-operation in this case developed over the decades and is working and the future looks promising. The reason why it is working is probably because there has not been any open conflict, and as Chomchai (1995, p.253) remarked, "whatever differences in the attitudes of riparian countries to the Mekong river there may have been, one overriding need is common to all. This is for the basic data which is indispensable for rational planning and the operation of water resources projects". The riparian countries have to co-operate if they do not want to lose or damage their water resources.

Another example of joint management of natural resources is the Australia-Indonesia Zone of Co-operation which was created by the Australia-Indonesia treaty in 1989. This off-shore Zone of Co-operation covers three areas: "Area A is the zone of joint development of the oil and gas reserves, whilst Areas B and C are under the sole

jurisdiction of Australia and Indonesia". A similar agreement could be created for the Dead Sea. The Sea could be the zone for co-operation whereas the Works itself stay under the jurisdiction of Israel and Jordan. There is little doubt that shared natural resources leave no alternative than to co-operate. Therefore, they are the basis for any further transboundary co-operation.

However, transboundary co-operation should happen at a regional level and not be imposed by governments, sitting in the core areas. Politicians should also acknowledge that it takes time to develop. It took time in Europe, it took time in North America, and will take time in the Arava Valley. The people there need to be involved, and they need to have the will to co-operate, as well as the politicians. The European Outline Convention was drawn up because people living in the borderlands took the initiative and asked the politicians for support. However, whether the local people in the Arava are going to take the initiative has to be questioned. The Arava Valley was only settled in the last forty years. Unlike most borderlands in the world, there are no historical or family ties between the two sets of borderlanders. Therefore, the transboundary interaction between the two borderlands might only be occasional trips for shopping or a day out.

The aim of transboundary co-operation in the Arava Valley should be to improve the living conditions of the people in the borderlands. Its aim should be that both sides are gaining from it. Both sides should be winners, or one side should at least not lose all the games. Governments need to be prepared to sacrifice their national interests in the interests of long-term collaboration. In the case of the Arava Valley only the following decades will prove if there will be fruitful transboundary co-operation.

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