SETTLEMENT IN ISRAEL

Jerusalem 1976

Ministry of the Interior

SETTLEMENT IN ISRAEL

ISRAEL NATIONAL REPORT
TO
HABITAT
UNITED NATIONS CONFERENCE
ON HUMAN SETTLEMENTS

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FOREWORD

The establishment of the State of Israel in 1948 was followed by rapid population growth due to large scale immigration. The Government committed itself to providing the Jewish and Arab population with decent housing in well-planned settlements, to maintaining a balance between the urban and rural sectors of the community and to preventing the deterioration of the environment.

The 800 rural settlements established during the last hundred years were based on principles of national land ownership and management, of self-labor and of equality of income. Prospective inhabitants were free to choose the style of life they wanted. The rural settlements were innovative in their social organization and spatial form and have been of tremendous importance in the shaping of the Israeli nation.

Heavy emphasis was put on rural development. Agricultural land was strictly protected by law from conversion to other uses, and efficiency in the agricultural sector was brought up to a very high level. However, scarcity of land and water resources restricted the expansion of employment in agriculture and the main absorption of immigrants was in the urban sector. The Government adopted a policy of establishing urban settlements in peripheral and under-developed areas of the country to disperse the population from the congested coastal strip. A national planning machinery was created, which could direct the distribution of investment in housing, services and the generation of employment opportunities to the new settlements. Twenty-nine new towns were established, some of which are now flourishing settlements; some still need assistance and their revitalization will be one of the major tasks of the Government in the future.

The preservation of the country's rich heritage of archaeological and historic sites and quarters strengthens the cultural links between the past and the present. It is particularly important in the planning and building of Jerusalem, the historic heart and modern capital of Israel.

The State of Israel is eager to share its experience in the search for solutions to the many problems of human settlement. It joins the international community in its efforts to improve the quality of life for all humanity through better human settlement.

Haim Kubersky,
Director-General,
Ministry of the Interior and
Chairman, National Board
for Planning and Building

PREFACE

The improvement of man's living conditions is one of the most important environmental issues today. With growing pressures of population on limited resources, ways need to be found of making better use of areas with available space for settlement. Much of the national effort in Israel has gone into the establishment of settlements in under-used areas, through the removal of physical constraints which had hindered man's use of the land. Both urban and rural settlements have been successfully established in mountainous and desert areas, with due consideration to environmental conditions, by introducing agricultural and industrial activities into regions which had previously not been considered as economically productive.

Preparations for the Habitat Conference were undertaken by a national committee composed of:

Mr. Zeev Barkai	Ministry of Housing
Mr. Yaacov Dash	Ministry of the Interior
Mr. Ehud Gavrielli	Ministry of the Interior
Professor Baruch Givoni	Technion, Israel Institute of Technology
Mr. Avshalom Rokach	The Jewish Agency Settlement Department
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As Chairman of this Committee, I should like to thank the members for their work.

This report is based partly on material specially written for the Habitat Conference by:

Mr. Ephraim Orni, of the Jewish National Fund, on land management, land reclamation and forestry;

Mr. Avshalom Rokach, of the Jewish Agency Settlement Department, on rural settlement and the Lachish Region;

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Other parts of the report are based on material previously published elsewhere, by:

Lichfield on new towns and on the planning of Jerusalem;

Gardi on the reconstruction of the Jewish Quarter of Jerusalem;

Glikson on the Kiryat Gat integral habitational unit.

(See source material)

I should like to thank the authors for their contributions. I should also like to thank Professor Aryeh Shahar for his advice in editing the report. Special thanks are due to Valerie Brachya and Paulette Mandelbaum for the great efforts they put into preparing this report.

Dr. Uri Marinov
Director, Environmental Protection Service and
Chairman, National Committee for the Habitat
Conference

EXAMEN DE LA POLITIQUE NATIONALE DE L'HABITAT (RURAL ET URBAIN)

Au cours des 50 dernières annees, Israël s'est transformée d'un pays sous-développé et à population clairsemée d'un demi-million d'habitants en un pays dont la densité

urbaine et la densité de population sont parmi les plus élevées du monde, la population actuelle étant de plus de 3 millions d'habitants.

Bien que la région ait été habitée depuis que l'homme est sédentaire, elle n'a pas subi les influences de la révolution industrielle. C'est le contraire qui s'est produit: le niveau de peuplement a baissé et la région fut délaissée. C'est au cours de ce dernier demi-siècle que le peuplement rural et le peuplement urbain se sont considérablement et rapidement accrus.

De ce point de vue, l'habitat rural a été la plus privilégié, étant donné que les premiers immigrants juifs accordaient beaucoup d'importance au mode de vie rural. L'attitude anti-ville constituait une caractéristique importante de l'idéologie sioniste et ceci se ressent actuellement dans le fait que les problèmes des villes ne font pas l'objet d'une attention suffisante, sauf en ce qui concerne le choix des sites. Dans ce rapport, nous avons attiré l'attention sur les mesures de planification urbaine qui ont été efficaces en Israël et dont les leçons à en tirer peuvent être utiles à d'autres pays faisant face à des problèmes semblables.

En ce qui concerne l'habitat rural en Israël, l'objectif principal fut d'élargir la zone qui se prête au peuplement, d'une part, et d'accroître l'intensité du peuplement, d'autre part. Les premières étapes furent de réparer les dégâts du délaissement des terres et de repeupler des régions abandonnées. La plupart des marais de la plaine côtière et des vallées ainsi qu'une grande partie de l'érosion des collines furent créés par l'homme. Avant de repeupler, il fallu défricher, réparer les systèmes de drainage, reconstruire les terrasses et replanter les forêts. Plus tard, le problème fut de repeupler des zones qui n'avaient jamais été cultivées. La limitation principale fut l'eau. Un système national d'adduction d'eau fut établi qui assure un apport constant et sûr d'eau vers les zones arides et permit de créer de nouvelles régions agricoles. Actuellement, le problème de l'eau constitute toujours l'obstacle principal en ce qui concerne l'expansion de l'habitat rural et les efforts sont maintenant concentrés dans la recherche d'autres ressources en eau en vue d'accroître le peuplement du désert.

Un des objectifs du peuplement des campagnes en Israël fut de créer une structure de base qui utiliserait au mieux les ressources limitées du pays et qui offrirait un niveau de vie satisfaisant à ses habitants. Ainsi furent établis des villages coopératifs et collectifs dans le cadre d'une démocracie politique. Au début, les principes idéologiques des premiers immigrants furent appliqués; plus tard, ils devirent l'habitat rural-type du pays. Ils permirent à la population rurale d'atteindre un niveau élevé de production agricole et de bénéficier de bonnes conditions de vie. Ils se révélèrent suffisamment souples pour s'adapter aux changement des techniques

agricoles. C'est là que s'installèrent les immigrants qui arrivèrent dans le pays plus tard, sans tendances idéologiques marquées en ce qui concerne les villages coopératifs et sans expérience préalable de l'agriculture moderne. Le principe de la coopérative ne fut pas appliqué uniquement au village lui-même mais également à la région lorsque de nouvelles zones furent développées.

Maintenant on se préoccupe surtout de peupler le désert vu qu'il représente une surface immense. Cependant les possibilités de développement agricole sont limitées et sont très coûteuses. Il est douteux que l'agriculture y soit rentable spécialement si les subsides, particulièrement pour l'eau, étaient supprimés. Actuellement, afin d'accroître le peuplement du désert, on a tendance à y implanter des entreprises industrielles qui utilisent et transforment les matières premières de cette région. Le problème principal est de rendre les conditions de vie tolérables à un prix raisonable pour les habitants.

En ce qui concerne l'habitat urbain en Israël, il convient de signaler qu'il existe un plan d'urbanisation. Le processus naturel de peuplement a donné lieu à une structure primaire de trois villes principales et à des centaines de villages agricoles avec à peu près rien entre ces deux extrêmes. Grâce à une politique d'urbanisation, le stade intermédiaire fut établi, c'est-à-dire les petites agglomérations et les villes de moyenne grandeur. L'habitat urbain fut étendu à des zones sous-développées du pays. Vingt-neuf nouvelles villes furent établies; les plus grandes furent une réussite tandis que de nombreuses petites villes sont en grande partie tributaires de l'aide gouvernementale.

La croissance urbaine accélérée et la construction par le gouvernement de plus de la moitié des immeubles d'habitation font que l'architecture du pays est standardisée et monotone (sauf Jérusalem). Par contre, une tendance se manifeste actuellement en vue de conserver des bâtiments anciens ayant une valuer historique ou architecturale et en vue de conserver des zones entières dont les bâtiments sont plus anciens et ont un style digne d'intérêt. On les conserve et on les restaure parce qu'ils représentent le patrimoine historique du pays et certains d'entre eux ont été transformés, avec succès du point de vue commercial, en attractions touristiques.

Il convient de signaler ici le cas de Jérusalem qui s'est beaucoup développée depuis la réunification de 1967. En ce qui concerne l'activité commerciale, elle est toujours très en retard par rapport à Tel-Aviv. Cependant Jérusalem est maintenant un important centre administratif et culturel. On s'est efforcé de conserver à la ville son caractère particulier, par exemple, en faisant construire en pierre ses immeubles modernes. Des experts internationaux furent consultés lors de l'établissement du plan d'urbanisation.

UN ARTICULO SOBRE LA POLITICA DE ASENTAMIENTO NACIONAL (RURAL Y URBANO)

Durante los últimos 50 años, Israel ha combiado de un asentamiento expandido y de un país subdesarrollado con una población de menos de medio millón, a uno de los países más urbanizados y más densamente poblados del mundo, con un población de sobre los 3 millones. A pesar de que esta área ha sido colonizada desde comienzos de la vida sedentaria, estuvo ausente de las presiones de la era de la Revolución Industrial. Por el contrario; el nivel de asentamiento disminuyó y el área cayó en negligencia. En el último medio-siglo, fue levantada nuevamente, en lo que a la intensidad de un modelo común de asentamiento rural se refiere, como también en el rápido ritmo de asentamiento urbano.

Mucha atención se centró en el asentamiento rural, debido a que los primeros inmigrantes Judíos reforzaron los valores de la forma de vida agrícola. El tema anti-ciudad era un fuerte rasgo de la ideología zionista y ahora se refleja en la falta de atención a los problemas urbanos, excepto en términos de localización de los asentamientos urbanos. Para los propósitos de este reportaje, se ha puesto énfasis en aquellos aspectos de programación de asentamiento que han alcanzado alguna medida de éxito in Israel y los cuales pueden ofrecer experiencia a otros países con problemas similares. La experiencia de Israel en asentamiento rural muestra vías de aumento del area apropiada para asentamiento y de aumento en la intensidad de asentamiento. Los primeros pasos se concentraron en reparar el daño por negligencia, para retornar el asentamiento a áreas que estaban en desuso. Muchos de los pantanos del plano de la costa y de los valles, y gran parte de la erosión montañosa, fueron hechos por el hombre. Proyectos de recuperación deben preceder al reasentamiento, para reparar sistemas de drenaje, para reconstruir terrazas en las colinas y para replantar bosques que habían sido cortados. En pasos posteriores la cuestión era encontrar vías de asentamiento en áreas que no habían sido previamente cultivadas. La limitación principal en su uso era el agua. La construcción de la red nacional de agua llevó una constante y segura fuente de agua dulce a áreas áridas y así capacitó nuevas áreas para uso agrícola. La presente restricción en la expansión del asentamiento agrícola es todavía el agua, y la atención se ha volcado ahora en la búsqueda de fuentes alternativas de agua para ulteriores asentamientos en el desierto.

El otro propósito del asentamiento rural en Israel era crear una estructura organizada que hiciera el mejor uso posible de los recursos limitados y que pudiera dar un nivel de vida satisfactorio a sus habitantes. Los resultados de ésto son asentamientos cooperativos y colectivos establecidos en el contexto de una democracia política. Estos fueron basados originalmente en los conceptos ideológicos de los primeros inmigrantes, pero posteriormente llegaron a ser el tipo standard del asentamiento rural del país. Ellos permitieron a la población rural alcanzar un alto nivel de producción agrícola y buenas condiciones de vida para sus habitantes. Ellos se mostraron suficientemente flexibles para adaptarse a cambios en las técnicas agrícolas. Ellos llegaron a ser la forma de vida para inmigrantes posteriores que llegaron al país sin fuertes aspiraciones ideológicas para un asentamiento colectivo y sin

ninguna experiencia previa en agricultura moderna. El principio cooperativo no solo fue aplicado al asentamiento individual, sino que también a la estructura regional en el desarrollo de nuevas áreas.

Actualmente se esta poniendo especial atención al asentamiento en el desierto, debido a que el desierto constituye una reserva enorme, en términos de espacio. Las posibilidades para el desarrollo agrícola son limitadas y excesivamente costosas. Es dudable si el desarrollo agrícola sería económico en el caso de que los subsidios, especialmente para el agua, fueran removidos. Ahora, los esfuerzos estan siendo volcados a la industria como la base para la expansión en el desierto, inicialmente basados en procesar las materias primas locales. El problema principal del asentamiento en el desierto, hoy en día, es encontrar el camino para hacer más tolerables las condiciones de vida bajo un precio razonable a sus habitantes.

Pasando a los asentamientos urbanos, la característica mayor en Israel es que hubo un proceso de urbanización planeada. El proceso natural de asentamiento ha resultado en una estructura principal de 3 ciudades mayores y cientos de pueblos rurales y de cultivo, sin casi nada entre los dos extremos. Una deliberada política de urbanización creo la ciudad intermedia, de pequeño y medio tamaño, y expandió el asentamiento urbano a regiones subdesarrolladas del país. Se establecieron 29 ciudades nuevas, de las cuales las más grandes tuvieron mucho éxito, pero muchas de las más pequeñas dependen aún seriamente de la ayuda gubernamental.

El rapidísimo paso de urbanización, y la construcción de más de la mitad de las viviendas del país por el Ministerio de Vivienda, ha resultado en la predominancia de una arquitectura standarizada y monótona del mismo estilo, época y método de construcción a lo largo de todo el país (exceptuando a Jerusalem). A raíz de todo ésto, hay una creciente apreciación del valor de conservar viejos edificios de especial importancia histórica o arquitectónica y de conservar áreas de antiguos y distintivos estilos de construcción. Estos estan siendo conservados y restablecidos como una parte de la herencia histórica del país, y algunos también han sido transformados en atracciones turísticas con mucho éxito comercial.

Mención especial se debe hacer a Jerusalem, la cual se ha desarrollado enormemente desde la reunificación en 1967. Comercialmente, esta aún se encuentra muy por debajo de Tel-Aviv, pero ahora es un gran centro administrativo y educacional. Durante su crecimiento se puso especial atención en conservar el caracter especial de la ciudad, por ejemplo, en el estilo distintivo de sus modernos edificios de piedra. Consejos internacionales se han tomado en la búsqueda de la apropiada pauta de planificación para su futuro desarrollo.

INTRODUCTION

1.0 A REVIEW OF NATIONAL SETTLEMENT POLICY (RURAL AND URBAN)

1.1 During the last 50 years, Israel has changed from a sparsely-settled, under-developed country supporting a population of under half a million, to one of the most highly urbanised and densely settled countries of the world, with a population of over 3 million. Though this area has been settled since the start of sedentary life, it missed the pressures of the industrial revolution era. The opposite occurred; the level of settlement decreased and the area fell into neglect. In the last half-century, it has caught up again, both in the intensity of the current pattern of rural settlement and in the very rapid rate of urban settlement.

1.2 Most attention focused on rural settlement, for the early Jewish immigrants stressed the values of the agricultural way of life. An anti-city theme was a strong feature of Zionist ideology and this is now reflected in less attention paid to urban problems, except in terms of the location of urban settlements. For the purposes of this report, emphasis has been placed on those aspects of settlement planning which have achieved some measure of success in Israel and which may offer experience to other countries with similar problems.

1.3 Israel's experience in rural settlement shows ways of increasing the area suitable for settlement and of increasing the intensity of settlement. The first stages concentrated on repairing the damage of neglect, to bring back settlement to areas which had fallen into disuse. Much of the swamps of the coastal plain and the valleys, and much of the hill erosion, was manmade. Reclamation projects had to precede re-settlement, to repair drainage systems, to reconstruct hill terraces and to re-plant forests that had been cut down. Later the question was more one of finding ways of settling areas that had not been previously cultivated. The main limitation on their use was water. The construction of the national water grid brought a constant and reliable source of fresh water to arid areas and so enabled new areas to be brought into agricultural use. The present restriction on the further expansion of agricultural settlement is still water, and attention has now been turned to seeking alternative sources of water to further settlement in the desert.

1.4 In addition to the ideological aim of establishing settlements in rural areas, another aim was to create an organizational structure which would make the best use of limited resources and which would provide a satisfactory standard of living for the inhabitants. The results were cooperative and collective settlements established in the context of a political democracy. They were originally based on the ideological concepts of the early immigrants, but later became the standard rural settlement type of the country. They enabled the rural population to achieve a high standard of agricultural production and of living conditions and proved sufficiently flexible to adapt to changes in agricultural techniques. They became the way of life for later immigrants who came to the country with not strong ideological aspirations to cooperative settlement nor with any previous experience of modern agriculture. The cooperative principle was not only applied to the individual settlement but to the regional structure in the development of new areas.

1.5 Special attention is now being paid to desert settlement, as the desert constitutes an enormous reserve in terms of space. The possibilities for agricultural development are limited and are exceedingly expensive. It is questionable if agricultural development would be economic if the subsidies, particularly for water, were removed. Attention is now being focused on industry as the basis for the expansion of settlement in the desert, initially concerned with the processing of local raw materials. The main problem today in desert settlement is to find ways of making living conditions more tolerable at a reasonable price for the inhabitants.

1.6 Turning to urban settlement, the major characteristic in Israel is the planned process of urbanization. The natural process of settlement had resulted in a primate structure of 3 major cities and hundreds of rural farming villages, with hardly anything in between the two extremes. A deliberate urbanization policy created the intermediate, small and medium size towns and spread urban settlement to underdeveloped regions of the country. Twenty-nine new towns were established, of which the larger ones were highly successful, but many of the smaller ones are still heavily dependent on government assistance.

1.7 The very rapid pace of urbanization has resulted in a predominance of standardised, monotonous architecture of the same style, age and method of construction all over the country (except Jerusalem). In light of this, there is a growing appreciation of the value of conserving older buildings of special historic or architectural importance and of conserving areas of older, distinctive styles of building. They are being conserved and restored as part of the country's historic heritage, and some have also been transformed into commercially successful tourist attractions.

1.8 Special mention must be made of Jerusalem which has developed at a very rapid pace since re-unification in 1967. During its growth, special attention was paid to conserving the special character of the city, for example, in the distinctive style of its modern stone buildings. International advice was taken in seeking the appropriate planning guidelines for its future development.

2.0 BACKGROUND DATA

2.1 Physical Background

2.1.1 Israel is characterised by a very wide range of physical conditions within a relatively small area. The size of the country is only 20,000 sq km, but it contains desert, tropical and alpine environments in close proximity to one another. Topographic structure is the main factor generating this variety, though another is the country's location at a world cross-roads of climatic and botanic regions.

2.1.2 The main topographic formation is the Rift Valley, running north-south along the east of the country for about 400 km. Physical conditions along the valley change rapidly from the alpine environment of the Hermon slopes on the Lebanese border (1000 m) to the subtropical environment of the shores of the Sea

of Galilee (Lake Kinneret) (–210 m) to the salt-laden Dead Sea, the lowest point on earth (–400 m), to the Arava, a desert plain running south to the shores of the Red Sea.

2.1.3 The southern half of the country can be classified as desert, where precipitation falls under 250 mm p.a. and even down to 20 mm p.a. at Eilat on the Red Sea. Topographic variations in the northern half of the country divide it into 3 regions: the limestone mountains of the North (Galil) and center (Judean Hills); the alluvial valley of the upper Jordan and the valleys of Jezreel and Bet Shean, running east-west linking the Rift Valley to the Mediterranean coast; and the Mediterranean coastal plain, with sandstone ridges, sand dunes areas and highly fertile alluvial soils.

2.1.4 The northern part of the country has a Mediterranean climate, with rainfall concentrated into the 4 winter months, and with maximum summer temperatures of about 18–27°C. The wide variety of vegetation reflects not only the changes in topographic and climatic conditions, but also the location of the country at the meeting point of 3 world vegetation zones: Mediterranean, Irano-Turanian and Saharo-Arabian phyto and zoogeographic regions.

2.1.5 The landscape of the country reflects man's uses of and impacts on the physical resources. The coastal plain and the alluvial valleys are highly intensive agricultural areas, with citrus and fruit orchards and field crops. The coastal plain is also the center of the country's industry and service activities and is highly urbanised. The mountains have suffered from deforrestation and overgrazing though afforestation programmes have brought back a tree cover to some areas (see 6.5).

2.2 Population characteristics

2.2.1 The most outstanding characteristic of Israel's population is its rate of growth. Over the last 25 years, the population has increased from under 900,000 in 1948 to nearly 3½ million in 1975. Most of the increase was brought about by large-scale immigration, mainly from Europe, Asia and Africa, but by 1973, nearly 50% of the population was born in Israel itself.

2.2.2 The rapid rise in population is reflected in the rise in density of settlement. The overall population density of the country rose from 43 persons per square kilometer in 1948 to 168 in 1974. This average is not very meaningful as the distribution of settlement over the country is very uneven. About 60% of the country is very sparsely settled, with an average density of only 27 persons per sq km. On the other hand, the remainder has a far higher density, rising to over 5000 persons per sq km in parts of the coastal plain.

2.2.3 The distribution is even more uneven when the degree of urbanization is taken into account. Israel has a very high rate of urbanization, with 87% of its population living in towns of over 10,000 inhabitants and with 50% living in towns of over 50,000.

2.2.4 The pattern of population distribution is partly the result of the country's employment structure and partly the result of government policy. Much emphasis was put on agricultural development and rural settlement in the past by early immigrants, though today agriculture accounts for under 10% of the country's employment. The growth of manufacturing, industry and services has largely concentrated in urban centers. There is no doubt that the distribution of population would have been even more uneven, with even greater concentration in the coastal plain and particularly in the major cities, if it had not been for a government policy of population dispersal (see 12.0). It was by the implementation of this policy that underdeveloped parts of the country were settled, and new towns established (see 13.0).

3.0 LAND MANAGEMENT

3.1 Public and private ownership

3.1.1 One of the outstanding characteristics of Israel is that about 91% of the land (18,000 sq km) is in public ownership, most by the State and some by the Jewish National Fund. It has been a major factor in enabling planning of land use, management and control of land users and reducing land speculation.

3.1.2 Of the holdings in private ownership, the majority of rural areas belong to Arabs and Druze. Jewish private land ownership is mostly concentrated in the three large cities of Tel-Aviv, Jerusalem and Haifa and their surrounding areas as well as in old-established settlements of the coastal plain which, in most cases, have in the course of time become towns or cities. In Israel, individual ownership of extensive rural areas is practically non-existent. The largest areas in individual ownership rarely exceed a few score hectares, and even such cases are exceptional.

3.1.3 A legal framework for land ownership came into being when the Knesset (Israel's parliament) passed the Israel Lands Law, and the Israel Lands Administration Law in 1960. An agreement between the Government and the Jewish National Fund set up an Israel Land Authority for the management of public land. The key paragraph of the land laws stipulates the inalienability of all holdings belonging to the public bodies represented by the Israel Land Authority, whereby the term "holding" embraces both the land itself and all buildings and other property on it. Only a few exceptions to this prohibition of land sale are allowed, the most important of them referring to non-agricultural plots whose total area in the country, however, may not exceed 10,000 hectares (100 sq km). The national land policy of the Israel Land Authority is defined in the statutory agreement as to "increase the absorptive capacity of Israel's territory for additional population" and to "prevent the concentration of large estates in the hands of individual persons."

3.2 Contracts for the lease of public land

3.2.1 The leasehold contracts issued by the Land Authority in general run for periods of 49 years and can be automatically renewed. The contracts appear in different forms, adapted to each purpose of land use – agriculture, industry, housing, etc. In three cases the leasehold period is limited to a few years only: for agricultural soils leased out temporarily for plantations, field crops, pastures, etc., until permanent lessees take over; in temporary contracts signed with the Jewish Agency to prepare areas for new settlements whose inhabitants will later become the permanent contract partners; and temporary contracts signed with the Ministry of Housing, with housing companies or with building contractors (to provide a legal foothold for construction work) which are later replaced by individual contracts with the apartment owners.

3.2.2 The contracts protect the lessee's rights while preventing damage to public interest through unwarranted exploitation. Provisions are included in contracts to curtail as far as possible speculative gains which individuals may attempt to obtain from the sale or manipulation of leasehold contracts. A "consent fee" for the transfer of contracts (particularly for urban or suburban holdings) was introduced to enable the general public, via the land-owning institution, to benefit from the profits of development which itself had benefitted from public investment in road-building, and the installation of water, sewage and electricity services. For agricultural lands, consent fees may not exceed one third of the difference in value of the land between the time of signing of the original contract and the date of its transfer.

3.2.3 With the lessor's consent, lessees may bequeath their holdings – whether an apartment or a farm – to one heir. Subdivision of agricultural leaseholds between several heirs is prohibited, as is the consolidation of several holdings into the estate of a single individual. This rule precludes both fragmentation of farmsteads into plots which would no longer be viable, and the creation of large estates which would have to rely on hired labor.

3.2.4 A clause in agricultural contracts requires that the lessee himself live permanently on the leaseholding and that he invest in it his personal work. He is free to decide on the manner of cultivation and the choice of crops, but he may use the land for agriculture only. He is obliged to apply adequate farming methods and has to refrain from any steps which might lead to soil erosion or other deterioration of farming conditions. He must obtain the lessor's permission for construction of buildings, digging of drainage ditches, opening of access ways, building of roads, laying of pipes, erection of fences, etc. As a matter of principle, the approval is given as long as such steps serve the lessee's personal needs or promote his farming objectives, while not contravening local, regional or national planning principles.

3.3 Leasehold terms

3.3.1 The lessee pays the lessor a very moderate annual leasehold rent. Certain institutions concerned with public welfare may obtain particularly favorable conditions, in some instances paying symbolic leasehold fees only. For farming land, fees are calculated (in most cases through the services of a government assessor) from the income which the holding is expected to yield. For at least the first seven years, fees do not exceed 2% of this sum, and most settlements in outlying and difficult regions are altogether exempt from leasehold fees for an initial period. The assessment is made for each region based on the availability and cost of water, transport costs, etc. Annual fees for urban lands are a small percentage (generally 3 or 4%) of the value of the specific plot at the time the contract is signed. The lessee is entitled to appeal against the assessment and demand that it be referred for decision to the Chief Government Assessor.

3.3.2 The lessor has the right to increase the leasehold fees by 35% every seven years, to take into account the average rise in land values and/or the increase to be expected in the income from farm crops, industrial products, tourist or commercial enterprises, as the case may be. Both lessor and lessee may at the relevant dates demand an official reassessment. The lessor is also entitled to link leasehold fees to the cost-of-living index.

3.3.3 If the lessee wishes to change the land use, e.g., build a factory on agricultural land, he has to obtain the lessor's consent which is granted if the project is consistent with planning policies, if it will not harm public economic interests nor disfigure the landscape. Where the land use change is approved, leasehold fees are adapted to the holding's new use, and the previous contract is replaced by one relating to the new type of land use.

3.3.4 When government or local authorities propose a change in land use (e.g. when previously agricultural areas are designated for urban development), the lessor is entitled to end the contract, but has to give the lessee advance notice of at least a year and pay him full compensation, according to the value of the leasehold at the date the contract is terminated.

3.3.5 To reduce the burden of leasehold fees on apartment owners and to reduce the administrative work of the Israel Land Authority in fee collection and negotiating legal claims, new regulations came into force in 1974. Annual leasehold rents for housing are replaced by fees for the entire 49-year leasehold period in advance, capitalized on the basis of a 5% annual rent increase. No additional demands can be made on the lessee for increases in land values and rises in the cost-of-living index. Payment is calculated on a geographical basis, with easier conditions for housing schemes far from the country's main centers. The contract can be transferred to a new apartment owner without payment of a consent fee. The contract can be renewed for another 49 years, though both sides are entitled to demand a new assessment three years before the expiration of the old contract.

3.3.6 In accordance with the national policy of population dispersal (see 12.0) the Land Authority increased the regional differentials in leasehold fees. In the central section of the coastal plain, rates for apartments will be based on the full market value of the land from 1976. The new fee scale will amount to a three- to sevenfold increase in fees for public housing in the central part of the country and no increase in outlying development areas. The fee in Tel-Aviv and its surroundings or in central Jerusalem will in the future be ten times that for a similar apartment in for example Dimona or Eilat in the Negev, or up to thirty times larger than that in development towns needing government assistance like Ma'alot in the Galil or Mitzpe Ramon on the Negev Heights. The increase in income expected from the new scale will be used for creating the infrastructure for future housing projects.

4.0 PLANNING PROCEDURE AND DEVELOPMENT AGENCIES

A large proportion of the factors involved in settlement planning are under central government control. As the previous section described, most land is in public management. In addition, much development is initiated or guided by government directives, whether they be financial incentives or government participation in the ownership of economic enterprises. Moreover, there is a highly centralised physical planning machinery which can control public and private development.

4.1 Physical Planning System

4.1.1 The physical planning system consists of a hierarchy of 3 levels of planning: national, regional and local. Under the Planning and Building Law 1965, the top level of the hierarchy is the National Planning and Building Board, composed of representatives of government ministries, local government and public and professional organisations, and whose chairman is the Director General of the Ministry of the Interior. It is theoretically responsible for all planning in the country, but concentrates on the preparation of national plans and on the review of regional plans. The former is a particular feature of Israel's planning system. National plans prepared recently include: population dispersal, national parks and nature reserves; roads; airports; electricity generation and distribution; tourism and recreation; storage and distribution of floodwater; mining and quarrying; and solid waste disposal.

4.1.2 The regional level of the hierarchy is the responsibility of 6 District Planning and Building Commissions. The Commissions are composed of regional representatives of government ministries and of local authorities within the district, and their chairmen are the directors of the regional offices of the Ministry of the Interior. The Commissions receive the national plans for comment, prepare their regional plans for approval by the National Council, and assess plans submitted to them by the local level of the hierarchy.

4.1.3 The local level of the hierarchy are the 65 Local Planning and Building Commissions, composed of single or groups of local authorities. The local com-

missions prepare detailed plans for their areas, showing planned land use allocation, and submit them for approval to the District Commissions. The Local Commissions are responsible for decisions on applications for development permission, for issuing building permits and for taking action against illegal building. Where an application does not conform with an approved plan, the decision has to be referred up to the District Commission. Although representatives of the Central Government can attend the deliberations of the Local Planning Commission in an advisory capacity, the Commission's control over building within its jurisdiction is absolute. It can also re-allocate land between owners and can expropriate up to 40 percent of a single owner's land holdings for public purpose without compensation. For any land for recreational, educational, religious, or welfare institutions which is needed over and above this, or for other purposes such as public housing, the Government must pay fair market value. The persons affected have the right to appeal to the District Planning Commission, and in certain cases, to the Supreme Court, which may grant relief or force the administrating agency to desist. In all cases where the Local Commission deprives a person of his dwelling, the Commission must provide him with suitable alternative accommodation or reasonable compensation.

4.1.4 In addition to this basic hierarchy of planning machinery, there is a Committee for the Protection of Agricultural Land, which maintains strict control over the conversion of agricultural land to other uses, particularly to urban use.

4.2 Development agencies

4.2.1 Before the establishment of the State, land development and the provision of housing for immigrants was undertaken by the Jewish National Fund and the Jewish Agency Settlement Department. These two non-government agencies continue their developmental functions today, particularly in the bringing of previously undeveloped or under-developed areas into more active use. The Jewish National Fund, founded in 1901 by the Zionist Organization, was responsible for land acquisition, land reclamation preceding settlement, and afforestation, and continues today its activities of reclamation and afforestation. The Jewish Agency Settlement Department was and still is responsible for the establishment of rural settlements and of new areas for agricultural development.

4.2.2 Since the establishment of the State, the Ministry of Housing has been responsible for most of the public building in the country. The public sector plays a very large role in providing for housing needs in Israel; of the total of over 800,000 apartments built between 1949 and 1973, over 55% were built by the public sector. This high rate of building has enabled the country to maintain a decent level of housing conditions in spite of the severe pressures on the housing market. The Ministry of Housing builds most of the new agricultural settlements and the new towns (see 13.0) in the country which mainly provide housing for immigrants. It also builds housing in the existing urban areas to re-accommodate families living in overcrowded or bad conditions and to help young couples of limited means to purchase their first home.

4.3 Environmental aspects of planning and development

4.3.1 A Committee of Ministerial Representatives on Environmental Quality was established in 1973 to further co-operation between Ministries to prevent conflicts between encouraging development and protecting the environment. Its functions are to guide the Environmental Protection Service, to assign priorities and to receive reports on its activities; take further steps for the improvement of environmental quality; take decisions on matters which require inter-ministerial cooperation.

4.3.2 The Environmental Protection Service in the Ministry of the Interior was established in 1973 to: advise Ministries and planning and development bodies on environmental quality, either by request or at its own initiative, on the prevention of environmental damage and on the treatment of existing pollution; prepare a plan for the operation of a system of Environmental Impact Statements, which will fit into the present physical planning system; advise the National Board for Planning and Building on environmental aspects of planning; submit to the Government, in coordination with the Ministries dealing with the subject and with the planning bodies, an annual report on the state of the environment in Israel; collect information and data from Israel and abroad and distribute it to appropriate bodies; provide material for educational programs to increase awareness of environmental issues.

5.0 INTRODUCTION

Even before the establishment of the State of Israel in 1948, great emphasis was placed on rural settlement. Public capital and available manpower were focused on the development of rural areas, by the establishment of agricultural villages, reclamation of land for agriculture, development of water resources and the supply of social services. Most of the agriculture in the country had been primitive subsistence farming and much land was not cultivated at all because of swamps or insufficient water supply. The development of high density rural settlement based on modern farming methods had to be preceded by land reclamation, by drainage, by soil stabilization, by planting and by the supply of water to arid areas. Natural limits to agriculture were pushed back, especially in lands bordering on the desert, and rural settlement was expanded to previously uninhabited areas. The influx of immigrants became the inhabitants for new settlements based on ideological and economic principles of co-operative farming.

6.0 BASIS FOR SETTLEMENT: LAND

The overall aim of reclamation policies was to obtain maximum economic efficiency conducive with the conservation of natural resources. Techniques for the protection and winning of farm land and for restoring the country's woodland cover varied between the three basic landscape regions – the Lowlands, the Hills, and the arid Deserts.

6.1 The Lowlands

6.1.1 This region includes the Mediterranean coastal plain and the interior valleys in the north and center of the country. Over the last few decades, defective drainage has been repaired, swamps have been dried and endemic malaria stamped out. Most swamps were the result of man's neglect of farming land, of natural water courses and of drainage canals. Most were drained by digging ditches to the next stream bed or, near the shore, directly into the sea. Drying of swamps was supplemented by the planting of eucalyptus trees which consume large amounts of water. Agricultural drainage is still essential in many areas, to lower the groundwater horizon and to exploit the potential of often excellent alluvial soils (grumusols) in the Lowlands.

6.1.2 In the coastal plain, crop fields require protection by dune stabilization and the dunes themselves can be partly brought into farming use. Both on lighter inland soils as well as on heavier soil types, appropriate cultivation methods are used to prevent sheet erosion and similar damage. Initial planting along dune fringes was frequently followed by afforesting entire sandy expanses. Recently, areas of coarse sand have been brought into farming use, using trickle irrigation and using brackish water (though this is still at an experimental stage).

6.1.3 The dune belt of porous sand along the coast is also used for the interception of storm water flowing in winter through the wadis (dry valleys) to the sea. The water is initially retained in transit basins to allow the silt brought with the flash floods to settle; the clean water is then transferred to a seepage basin where it sinks undergound to join the groundwater table; it can then be pumped up through wells.

6.2 The Hills

6.2.1 The basic problem of land use in the hill areas is the strong run-off, which far exceeds the rate of formation of new soil from the rock. The soil cover of many hill slopes has practically disappeared. Terracing is used to combat erosion and prevent the loss of further cropland, using the naturally stepped slopes of alternating layers of hard limestone and soft marl strata. However, extensive areas cannot be used for farming and can at best be afforested.

6.2.2 The ancient art of terracing consisted of two phases: clearing stones from the land surface and building dry-stone terrace walls to reinforce and raise the edge of each natural rock step. Part of the work has now been mechanized, such as checking whether the amount of subsoil justifies the expense of terracing by using a huge rooter to furrow to a depth of about 50–60 cm. Recently, relatively shallow hill soils are being used for farming, where the bedrock surface is not too irregular. This follows the trend in modern hill farming to return to traditional Mediterranean fruit species like olives, almonds, vines and peaches whose roots are able to spread sideways where the rock prevents their penetration to depth.

6.2.3 Preparing hill areas for pasture is usually much cheaper than reclamation for fruit orchards and crops. It involves the eradication of undesirable plants by burning or spraying, and sowing desirable species of grasses and other plants, such as those with high nutritive value and which provide plant cover late into the spring or summer. (See also 9.3.)

6.3 The Deserts

6.3.1 Since the 1950's and 1960's, experience has shown that farming in the semidesert and desert areas of Israel can be profitable. In practically frost-free regions, summer vegetables, fruits and flowers can be produced in midwinter for markets overseas. The profitability justifies the high outlay required for soil conservation and reclamation.

6.3.2 In the desert areas, strong wind erosion and flash floods tear open deep, jagged gullies and form badlands, or transport and deposit unassorted alluvium on flat land. Moreover, the inherently fertile loess of the northern Negev forms a densely packed surface crust after each rain hindering seed germination and the penetration of rainwater into the subsoil. Water collects on the surface in flash

floods and causes severe gullying. In summer, the dry loess surface crumbles into fine dust which is easily blown by the wind from one field to the next. Strong, hot and dry summer winds also aggravate the problem of drought by increasing evaporation from the topsoil layer.

6.3.3 Many conservation measures are taken to combat crust forming, wind erosion, sheet erosion and gullying. Loess soil is plowed on contour lines. On steeper slopes, inclined earth terraces are laid out, with horizontal shallow ditches along their lower edge to collect rainwater runoff, and sometimes with reinforcement of the edge by strips of deep-rooted grasses or rows of trees. Farmers are advised to disc-plow their crop fields frequently to break the surface crust. Uneven ground is levelled off and most of the jagged gullies filled in, leaving a few straightened wadi beds for drainage. The banks are sometimes reinforced, either by bushes or trees or by chemical treatment of the soil, to prevent flash floods from breaking out and creating fresh gullies. Future fields are plowed in two directions and tree shelterbelts (mostly eucalyptus or tamarisk) are planted at intervals of 250–500 meters. Measurements have shown that the wind slackens to 60% of its original speed in front of the tree rows and to 50% at the back; the trees protect an area to a distance exceeding ten times their own height on the front and thirty times at the back. Windbreak trees in the Negev are today planted on top of 60–90 cm high earth ridges (méthode steppique) which both conserve moisture and enable the trees to grow, even in their first years, without irrigation in a zone where annual precipitation means are under 200 mm.

6.3.3 An increasing number of villages in the Eshkol Region and elsewhere are concentrating on highly intensive vegetable cultivation in modern greenhouses. This requires levelling and compacting of the ground for the erection of these large structures. In the Arava Valley, on the Dead Sea shore and in the Lower Jordan Valley "artificial oases" can be created if a minimum of groundwater is available. Methods making intensive farming feasible there include the protection of cultivated fields from flash floods by diverting wadi courses, often to a considerable distance from the cultivated tracts. Wadi beds are enclosed between high dams, sometimes hardened with stone or concrete. The ground is levelled and where possible, patches of arable soil are spread over an adjoining wider and infertile area. In some instances, loess or peat soil is brought from a distance to provide a layer over sterile sand or gravel surfaces. In addition, deep planting holes are excavated to enable the roots of the salt-tolerant date palms to reach the shallow ground water horizon. Other crops, mainly fruit trees, are often planted on the earth ridges.

6.3.4 Many soils have to be desalinated by saturation irrigation to counteract the concentration of dissolved salts in the upper horizon caused by capillary action. On reaching the surface, the water evaporates and the salt is left as a residue. Where salinity is moderate, the problem can be solved by draining off surplus groundwater through ditches, thus ensuring a constant downward movement of rain and irrigation water through the soil, carrying the salt to a depth greater than the plant roots. In the highly saline soils of the Lower Jordan and Arava valleys, this is preceded by "saturation irrigation" which involves flooding the area to a height of

about a meter by constructing low retaining walls of earth. Slightly brackish water in the first phase serves the purpose even better than fresh water.

6.4 Land use capability

6.4.1 Soon after Israel was established, a land-use capability survey was made in the non-desert areas by the Government Soil Conservation Service. The information collected included slope angles, depth and character of soils, type and degree of erosion, extent of stoniness, content of harmful salts, and deficiencies in drainage conditions. The land surveyed was classified according to capability and limiting factors, and revised later by soil studies. The desert areas were subsequently surveyed and a soil association map of Israel was prepared.

6.4.2 In 1948/49, only 165,000 hectares of land was cultivated out of the total arable area of over a million and the total land surface of over 2 million hectares. Only 30,000 hectares of the cultivated area was irrigated. By 1973/74, the cultivated area had expanded to 422,500 hectares of which 180,000 were under irrigation. This represents an increase of 260% and 600% respectively. Of the present totals, an area of about 55,000 hectares (including pasture) was won through land reclamation and 46,000 hectares of swamps were drained or fields were improved through agricultural drainage. This total of 101,000 hectares amounts to a quarter of Israel's farming surface.

6.5 Afforestation

6.5.1 Forests now cover an area approaching 5% of the country's total surface. Compared with regions of moist-temperature or wet-tropical zones, such a percentage is negligible, but since the country was practically treeless only six decades ago, the change is considerable.

6.5.2 One of the aims of afforestation was to restore the forests which had disappeared through centuries of neglect, warfare and destruction. In addition, forests fulfill numerous constructive functions. Trees can assist in soil conservation, by holding the loose earth with their roots and protecting the ground below from the impact of rains, and by assisting in the formation of new soil. Secondly, trees are planted in arid zones for sand dune stabilization, to prevent gullying and to serve as shelterbelts against wind erosion. Thirdly, Israel's forests provide timber, albeit in smaller quantity and of lower value than in countries with a moist-temperature climate, but their products ensure at least modest gains from areas which would otherwise be barren. In addition, woodlands contribute to making the landscape more hospitable, especially during the hot summers when temperatures of wooded areas are perceptibly lower than on bare ground, and on "sharav" days of dry desert winds, forests register a relatively higher air humidity.

6.5.3 Israel's area of planted forests has increased from under 5,000 hectares in 1948 to 57,300 hectares in 1972/73 and an estimated 60,000 hectares or more in 1975. Five million trees were planted before Statehood, and another 115 million since 1948, with the annual average since 1948 approaching 5 million. Of Israel's planted forest area, 35,000 hectares were covered in 1972/73 by coniferous trees, 12,400 by eucalyptus and 9,500 by other species (e.g., tamarisk, acacia, etc). In addition, there are 35,000 hectares of natural forests in various stages of restoration, predominantly consisting of kermes oak, other oak species and terebinths.

7.0 BASIS FOR SETTLEMENT: WATER

7.1 The need for a water system

7.1.1 Israel has a Mediterranean climate, varying from semi-arid in the north to arid in the south. The problem of water supply in Israel is that the water sources are unevenly distributed and are subject to rather high climatically determined fluctuations. Moreover, the water resources are most unfavorably located in relation to main areas of demand, since the principal resources are in the extreme north-eastern part of the country, while demand is concentrated in the center and south. Furthermore, the average elevation of water resources is well below that of areas of demand, and thus almost one-quarter of the power generated in Israel is used for pumping the water up to the required elevations.

7.2 The national water grid

7.2.1 To enable the expansion of agriculture and settlement, great efforts were concentrated in tapping and re-distributing sources of water. Rapid progress was made both on the development of a first generation of projects based on local water resources and on the further elaboration of the national master plan. First-generation projects usually drew their water from shallow wells drilled into the coastal sandstone formations. Second-generation projects, generally located farther east, derived their water from springs and deeper wells drilled into the limestone formations of the Judean mountains. These were inter-connected with first-generation projects and could thereby supplement supplies generated by the latter. Second-generation projects were, in turn, integrated into the national water grid by interconnection with the Jordan River System.

7.2.2 By the end of the fifties, most regional schemes had either been completed or were well advanced in their construction, and work was started on the main integrating feature of Israel's water system, the Jordan River System, representing the third generation of projects. This project had a triple objective. The obvious goal was the conveyance of part of the water of Israel's only substantial river, the Jordan, from the extreme north-eastern corner of the country to the main areas of demand in the center and south. A less conspicuous, but equally important, goal was the inter-connection into one system of the numerous local (first-generation)

and regional (second-generation) schemes constructed in the long, narrow coastal strip.

7.2.3 The least obvious, and most complex goal of the Jordan system was the inter-connection of Israel's only major surface reservoir, Lake Kinneret (Sea of Galilee), with the all-important cyclical regulative reservoir constituted by the two main ground-water formations, which extend from north to south along the coastal strip. The interconnecting and integrating function is effected by a large-capacity (20 m^3/sec) water conduit, running from Lake Kinneret in the north to the center and branching out from there to the south into two smaller, roughly parallel pipelines. Two major, and a number of subsidiary, pumping stations raise the water from the elevation of Lake Kinneret (210m below sea level) to the elevation dictated by the principal water uses (152 m above sea level).

7.2.4 Through the superposition of these integrating facilities on existing and subsequently constructed water projects, Israel's widely dispersed water conservation and distribution facilities were transformed into a fully integrated water grid. Thus, in an analogy with an electrical grid system, the various surface water, groundwater, and reclaimed water resources can now be drawn upon according to availability and demand, and management patterns worked out on a national scale for minimizing system losses and for the best overall utilization of the country's water in accordance with current climatic conditions and demands for water.

7.2.5 The National Water Grid was completed in 1964 and today conveys some 350 million cubic meters of water from the Sea of Galilee southward through 139 km of pipes, canals and tunnels. The system not only provides water for the Negev, but also gives the country as a whole an integrated water network of considerable flexibility. During the wet periods, when demand is not so great, the carrier is used to recharge wells and aquifers. This recharging has the secondary advantage of mixing the high quality water of the Sea of Galilee with the lower quality groundwater. The point has been reached, however, where large-scale diversion projects are no longer possible – for there is little water left to divert: 95% of the country's natural water resources are already being exploited. Further development will need alternative sources and better use of existing ones.

7.3 Increasing the water supply

7.3.1 Efforts are being made in water conservation, including (1) increasing irrigation efficiency by reducing conveyance losses, by improving the evenness of water spreading, and by limiting water applications to economically justifiable intensities; (2) studying the effect on crop-yields of the rate of water application, its intraseasonal scheduling, and its microdistribution in relation to individual plant rows – trickle irrigation, a new low-pressure, low-intensity irrigation method which represents a great improvement in the effectiveness of water use, is now being introduced on a significant scale; (3) studying costs and benefits (in terms of water saved and income increases achieved) of various agricultural techniques and, more

generally, of plant environment control; and (4) developing seeds with a high response to fertilizers under reduced application of irrigation water. An example is work on the role of hormones and reflective sprays in controlling the transpiration of water in plants. If a means of controlling transpiration could be found, it might become possible to save major quantities of water needed to raise crops in an arid zone. A method for water harvesting and distribution based on the ancient techniques of the Nabateans has been developed by Prof. Evenari at Avdat. These methods may prove feasible for limited areas and selected crops.

7.3.2 Attention is also being focused on new, non-conventional sources of water. Israel has a large supply of brackish water available, much of it deep in an underground semi-artesian aquifer about 500 meters under the western Negev desert. Its salinity is about 2500 ppm (parts per million), less than one tenth that of sea water, but still too high for use by agriculture utilizing traditional methods of irrigation, or for most industrial uses. If means of utilizing this water could be found, however, it could represent an important addition to the country's reserves. It has been estimated that in the Negev 30 million cubic meters could be drawn from this source annually with no depletion of the aquifer and that 100 million cubic meters could be taken annually for many tens of years without serious effect. There are additional sources of brackish water throughout Israel, amounting to some 200–300 million cubic meters per year.

7.3.3 The alternative approach to brackish water utilization calls for its direct use in irrigating salt-resistant crops. Initial attention has focussed on vegetables, cotton and wheat, and results have been excellent. However, the problem is not just one of finding salt-resistant species. New irrigation techniques based on work done in the U.S. as well as new Israeli innovations have been worked out and adapted to local conditions to prevent salt build-up in the soil. Genetic improvement of salt resistance is another direction being investigated.

7.3.4 Several desalination techniques are currently under investigation, and a number of pilot plants are now testing the technical and economic feasibility of these processes. The Israel Desalination Engineering Company has developed an efficient vapor compression unit that can supply desalinated sea water for municipal use. One is in operation in the southern city of Eilat which derives some 50% of its water from the sea. At the moment it seems that desalination of water will prove economical for industrial and municipal use, but will still have to be subsidized for agriculture.

7.3.5 Another means of increasing the country's water potential is the re-use of water currently discarded as waste. In recent years it has become clear that both municipal and industrial waste water can be re-used after suitable treatment. This can serve a double purpose, creating new sources of good water and as a means of preventing pollution. The high cost of fresh water in the desert may well make reconditioning of waste waters economical. However, since salinity is increased each time water is used, such processes would have to be coupled with a desalination system. Considerable research on this is being done.

7.3.6 The damming of wadis and the capture of flood waters has recently become a more and more important source of water. Because of high seepage and evaporation losses if allowed to stand, they are immediately pumped onto the fields, usually under cultivation with winter wheat. This additional water will ensure a good crop even if a flood occurs only once during the rainy season, but the drawback is its high cost and the fact that a winter may pass without a single flood. However, these dams seem nonetheless to have proven their economic feasibility under these conditions.

7.4 Water Management

7.4.1 To facilitate maximum efficiency in the utilisation of water, all resources are publicly owned and production and supply is controlled by a system of licensing. A national water company operates 60% of the country's water résources and the remainder is controlled by private or co-operative companies. A Water Law gives the Government widespread powers to control and restrict the activities of individual water users. Administrative control over the utilisation of water is exercised by the Water Commissioner, who is responsible to the Minister of Agriculture. The Commissioner implements the government water policies, carries out economic planning to meet future water demands, and sets prices.

8.0 RURAL SETTLEMENT

8.1 The aims of rural settlement

8.1.1 The rural settlements established in Israel since it gained independence in 1948 had three main aims: increase in agricultural production, provision of employment for immigrants and population dispersal.

8.1.2 With the establishment of the State, trade relations with neighboring countries ceased, and Israel was cut off from one of its major sources of supply of imported foodstuffs. At the same time large-scale immigration commenced, causing a sharp increase in demand for agricultural products. Development projects undertaken in the early years gave preference to the production of fresh foodstuffs – vegetables, fruit, milk, eggs, etc. Within five years, the shortage was overcome, and efforts were moved to agricultural production for export or for the replacement of items hitherto imported, such as citrus fruit, groundnuts, sugar beets, cotton, etc. Rural settlement was expanded to those areas and types of farming where such products could be grown. Some immigrants were absorbed rapidly into employment in agriculture. However, employment absorption in the rural economy accounted for only a small proportion of the total number of immigrants, and was never more than 20 percent, due principally to the limited resources of land and water available.

8.1.3 The policy of population dispersal brought settlement to some areas which were not rich in natural resources, which were far from centers of population, and had not hitherto been regarded as favorable for agriculture.

8.2 Principles and patterns of settlement

8.2.1 Rural development in Israel has followed the principles of:

a. National land management: nearly all the settlements were established on public land, which cannot be purchased but is leased to the settler for a period of 49 years. The lease is automatically extended to one of the farmers' heirs. As the holding is indivisible, fragmentation is avoided. (See 3.2.)

b. Self labor: the resources and means of production are allocated in such a manner as to enable farming families to do most of the work on their farm themselves, without habitually employing hired labor.

c. Opportunity for equal income: farm planning and allocation of the means of production are implemented according to the principle that all farmers should have the opportunity to attain a level of income that is roughly equal to one another and to the national average for skilled workers.

d. Free choice of settlement pattern: every settler is free to choose for himself the organizational and social framework, within which he wishes to live. The two prevailing settlement patterns in Israel are the Moshav and the Kibbutz; two others, less frequent patterns, are the Moshav Shitufi and the Moshava.

8.2.2 The *Moshav* is a cooperative of family farms, usually comprising 80–100 farm units. Each farming family is a separate economic and social unit, tilling its own fields and making its own decisions. All supplies (fertilizers, seeds, fodder, etc.) are purchased by the cooperative and made available to the farmers on a credit basis, with repayment from market returns. The produce is marketed by the cooperative, each farmer being credited according to his share in the products marketed. Certain other operations and services are also on a cooperative basis, e.g., collection, sorting and packing of produce, storage, agricultural machinery, etc. The elected village committee also handles social services (education, health, entertainment, etc.) for the farmers.

8.2.3 The *Kibbutz* is a unique form of settlement, in which both production and consumption are collective. Each family has a separate housing unit, but meals are generally served in a communal dining hall and in most Kibbutzim the children live in separate nurseries or houses. Production is managed and operated as a single unit, each member working according to a centralized work-schedule. All personal services are provided for the members by the collective. Elected committees are in charge of economic planning and development, decisions on investments, etc. Matters of major importance, such as decisions on the budget, the election of

committees and branch managers, etc., are submitted to the general meeting of members. The profits are not distributed among the members, but are re-invested in production branches or used to raise the standard of living.

8.2.4 The *Moshav Shitufi* is a pattern of settlement which combines the Kibbutz economic system with some of the social aspects of the Moshav, i.e. collective production with private consumption. Farming operations and schedules are conducted by an elected management, as in the Kibbutz. A monthly allowance is allocated to each family, which keeps its own private household.

8.2.5 The *Moshava* is based on private land ownership and individual farming, as one finds in most other countries.

8.2.6 The total rural population in Israel increased from 242,000 in 1948 to 470,000 in 1974. During a period of three years alone (1948–1950), some 280 new rural settlements were added to the 400 that already existed. In total, during the 26-year period, 1948–1974, the number of rural settlements has doubled.

Settlement Pattern	No. of Settlements End-1948	No. of Settlements End-1974
Moshav	91	352
Kibbutz	151	232
Moshav Shitufi	9	26
Private Patterns	43	49
Minority Village	95	98
Farms, Institutions, etc.	11	41
Total	400	798

8.2.7 The rate of rural settlement in Israel enabled agriculture to develop at a very rapid pace. The extension of cultivated and irrigated areas together with the increase in agricultural productivity and improved technology brought about a spectacular growth in agricultural production. From 1949 to 1973, total production increased more than tenfold.

8.3 Social Integration

8.3.1 The majority of the immigrants to the rural areas had not been employed in agriculture prior to their arrival in Israel. Most of them came from an urban background and the minority that had lived in rural areas either did not practice agriculture there or were engaged in subsistence agriculture which was basically different from the type of agriculture they encountered in Israel. Many came from developing countries and had cultural backgrounds very different from those prevalent in Israel. Their adjustment to the customary organizational structure of the country's rural settlements, based on cooperative systems, was especially difficult.

8.3.2 For those immigrants from Afro-Asian countries, the adaptation of the traditional societies even to the Moshav pattern was not simple. The immigrants usually arrived as whole communities, not as individuals, and they brought with them their own way of life – the patriarchal, traditional way of life based on the clan or hammula, as it is called in the Middle East – the stratified family with all its ramifications. At first an attempt was made to treat this new population just as the earlier immigrants had been treated in the past, applying accepted development methods, and relying on the knowledge obtained through Western academic education and previous experience. This procedure failed, and in 1952–1953 the whole settlement program which formed the backbone of all comprehensive rural development in Israel, seemed to be crumbling.

8.3.3 A new approach was tried in which the methods of development and of instruction were adapted to the social structure of the new settlers. Sociological researchers observed and followed-up the special characteristics of each ethnic group and adjusted development methods accordingly. To gain the full cooperation of the rural population concerned, the new settlers were trained and encouraged to take matters into their own hands and to participate actively in all stages of the development process. Cooperation with the locally accepted leaders, who were motivated to achieve the objectives of the project and were trained for their task, also helped.

8.3.4 In the initial stages of settlement only simple innovations which were easily understood, rather than drastic changes, were introduced. For example, full cooperative organization in the villages or democratic management of the village institutions was preceded by transitional arrangements better suited to the traditional background of the settlers.

8.3.5 Another two arrangements were introduced in order to help the settlers during the initial period of re-adjustment. Temporary employment was provided in public works such as building, afforestation, roadworks, land reclamation, installation of water pipelines and so on. And secondly a system of temporary farm-management was evolved. The village was managed by the settlement authority for the first year or two as a sort of training establishment and the settlers were paid for their work. The profits, if any, were divided among the settlers. The settlement authority sustained any losses that might have been incurred. This system was of particular importance because it facilitated the training of settlers in new methods and their adaptation to agricultural labor in cases where this was new to them. At the same time their livelihood was assured. This transition period was also used to train the settler in the management of a cooperative village.

8.4 Spatial and physical structure of rural settlement

8.4.1 In the course of years changes took place in the physical planning of the rural areas, both on the regional level and the individual village (Moshav) level. These new developments were aimed at improving the quality of life in the rural

areas, increasing economic efficiency and contributing to social integration of the rural population as well as rural-urban integration.

8.4.2 In the past, it was common practice to set up isolated settlements, each village containing 70–80 families. Each village maintained its own economic and social facilities. Conditions changed and concentrated settlement on a large scale became possible, with far more movement between the various regions. Economic conditions also changed with the transition from mainly fresh farm products (vegetables, eggs, milk, etc.) to industrial and export crops. The need arose for the construction of sugar refineries, cotton ginning plants, canning and preserving plants, packing and sorting centers for export produce, and so on. Moreover, educational and training facilities had to be provided for the thousands of new immigrants in the villages.

8.4.3 As a result of all these factors, a new system of regional settlement was developed, based on a pattern of rural centers for a number of agricultural villages (usually 5–7 villages with a total of 500 families). In this "Composite Rural Structure", the centers were designed to provide expensive services for the surrounding villages instead of each unit having to provide them independently. Such services included the school, clinic, bank, post office, and in some cases the sorting and packing stations, garages, etc. (see 10.2.1–10.2.4).

8.4.4 This regional structure had a social aim as well as an economic one. Experiments until 1954 to settle immigrants from different countries of origin in one village were not successful, because of the constant friction between settlers of different backgrounds. The new system allowed each village to remain a homogeneous ethnic unit and integration took place in the centers, at the central school, at social events, at work, at the clinic and in the shopping area. Thus constant contact between the settlers was maintained, while their villages remained independent social units.

8.4.5 A further link in the composite rural structure was the regional town, established to provide those services and plants designed for the larger population – commercial enterprises, banking and insurance companies, health services on a higher level, and industrial plants. Regional settlement areas were planned and established in various parts of the country and older areas were transformed to the new structure wherever possible.

8.4.6 This framework was designed essentially for Moshavim. Over the years, the Kibbutzim (plural of Kibbutz) have developed their own economic enterprises such as packing factories, cotton gins, poultry slaughter houses, grain silos and refrigeration plants and have founded cultural establishments such as community centers which serve several neighboring Kibbutzim. In this manner, rural settlements became more efficient and services did not fall below those in urban centers.

8.5 Physical Planning of the Moshav

8.5.1 Fifty years ago the Moshav was in fact an improved version of the subsistence farm. Though there already existed the tendency towards a more diversified type of farm, it was based mainly on field crops. The burden of services was small, and the settlement constituted a closed economic and social unit. This Moshav type numbered some 75 families with no connection or cooperation with other rural communities. The physical structure of the individual farm in the Moshav suited its social and economic characteristics. The dwelling, the farmstead and the fields all comprised one functional and spatial unit. Services were concentrated at the center of the Moshav, and the dwellings were located around in the form of a circle with the farmsteads and fields stretching out from the center of the village. With the expansion of settlement, the intensification and diversification of agriculture, the need for economic services such as supplies, marketing and packing facilities, and the demand for civic and social services, the size of the villages increased, both in terms of the number of families and in its area.

8.5.2 The larger villages were built on a linear design, with the obvious disadvantage of the long distance between the houses at either end and the services in the center. With the transition from a mixed farm unit to a specializing farm unit, in which there is one central branch of specialization with some auxiliary branches, there was intensified demand for a variety of services, especially the economic services related to the branches of specialization. At the same time, the importance of these services in the production process became as decisive as the production processes and the agrotechnology in the farm itself. In other words, the proximity of the service center to the house was preferred to that of the field to the house.

8.5.3 In response, new settlements were designed in a more compact structure. The first example was the establishment of the multi-neighborhood Moshav, consisting of three nuclei of 60 units each, around a service center for the 180 families living in these three neighborhoods. As the specialization process intensified, the design of "composite rural structure" was developed, first in the Lachish Region (see 10.0). This consisted of compact villages with a maximum of 70–80 farming units with relatively small farmyards, and with most of the plots at a distance from the house and its yard.

8.5.4 With further specialization, there is now emerging a new type of farm unit, with maximum separation between the residential area and the farmyard complex. It has evolved the need for:

a. spatial flexibility: to enable the adaptation of the farmyard dimensions and structures to conditions, as the need arises. One of the Moshavim now being established is an example of this kind of planning, where only the glasshouses are attached to the house, and the chicken-coops are built in a separate area.

b. Flexibility in ownership. In many veteran Moshavim, there is a tendency to establish "double farm units", jointly operated by father and son. To enable coor-

dination, each unit receives a house and courtyard, but the farm buildings (cowshed, etc.) are outside the residential area. This design keeps open the option to build an additional external chain of housing units for more families.

c. The need for cooperation in production. Specialization in many cases requires cooperation in production between two or three settlers especially in branches requiring year-round work. It enables "partners" to take vacation periods. The cooperative relationship can be a complete partnership or mutual help only. The proximity of the farmyard of different farmers makes the cooperative relationship easier.

d. The use of automatic and controlled systems. The growing mechanization in highly specialized farming includes not only automatic measures (such as automatic feeding) but also computer-operated electronic control systems. In dairy farming, Israel is about to introduce a system based on controlled feeding of each cow on the farm unit. This new system will make it possible to operate a cowshed from a distance. Other examples can be found in poultry feeding, in the control over the glasshouses branch, control of irrigation, etc.

e. Maintaining environmental quality. The separation between the houses and the farmyard will raise environmental quality by removing the nuisances caused by the proximity of the farmyard to the house. It will prevent exposure to animal odors, noise, dust, etc. and will prevent trucks bringing supplies and taking produce from passing through the residential area.

8.6 Rural Services

8.6.1 As long as the population was small and settlements widely dispersed, there was no need to centralize services. With the increase in immigration and the concurrent increase in settlement activities, the idea of regional cooperation in providing community services was put forward. It had the advantage of the economics of size, could attract population growth and could provide better services of a greater variety.

8.6.2 The idea of regional cooperation in public services is based on a qualitative, quantitative and spatial hierarchy. The more complex the service becomes, the more it demands highly skilled manpower, and more people benefit from it. On the other hand, in order to reach a greater number of people, organizational and professional cooperation among settlements is needed. Regional cooperation brought about a change in the spatial dispersal of population and settlements. Instead of single settlements spread at random according to the physical conditions of the area, settlements were planned in a cluster around one rural service center.

8.6.3 The simple service which requires limited manpower is supplied close to the settlers' home, whereas the more complex one is supplied cooperatively for a number of settlements. For example, in education – to maintain a nursery school or a

kindergarten for small children does not require more than one kindergarten teacher and one assistant per class. This service is available in each single settlement. However, an elementary school of 6–8 classes, which requires a larger population and a staff of trained teachers, serves a number of settlements. A high-school or a secondary vocational school requires a greater number of qualified teachers and must serve a larger number of settlements.

8.6.4 Three basic settlement levels constitute the hierarchy scheme for the provision of community services. The first level, Center-A, is for services that each single settlement maintains. The second level, Center-B, is the rural service center which provides services to 5–6 homogeneous settlements (Kibbutzim, Moshavim or Moshavim Shitufim). The third level, Center-C, is the regional town which does not exist in every sub-region. If it does, it usually provides services to different groups of settlements. Whereas, on the regional level there is a Center-D, the rural town, which may provide personal and community services and be a governmental administrative center.

8.6.5 An example of this hierarchical service structure is the structure of the rural health service. Each settlement, Center-A, has a small infirmary and a nurse providing basic treatment. In Center-B, the rural service center, there is a "health center" which maintains a small permanent team: a doctor (general practitioner), a nurse, a dentist, a mother and infant care service, a social worker and laboratory services. From the "health center", patients are referred to the hospital in Center-D (rural town) or to the district out-patient clinics. Health services organized along these lines include also preventive medicine and rehabilitation. The patient is being cared for comprehensively within his own environment, his family and community. The doctors at the clinic cooperate with the nurses at the various settlements and supervise their work by maintaining a weekly discussion group. When hospitalization or special treatment is necessary, it is organized through the "health center".

8.6.6 Prior to the "centralized" system, there was a different pattern of medical care: one doctor was in charge of four settlements. The doctor would travel around visiting every settlement twice a week. In every single village there was a clinic and a nurse. When hospitalization was needed, the patient was sent to a distant hospital or clinic. This often caused a lot of inconvenience to the patient and mutual exchange of current reports was lacking among the various medical bodies. The present method is much more efficient and convenient for the patient himself.

9.0 SETTLEMENT IN THE DESERT

9.1 Background

9.1.1 All of Israel can be classified as arid or semi-arid but the "true" desert lies to the south, in the Negev. It covers about 10,000 sq km, and is bounded on the north

by the 250 mm isohyet, on the west and south by Sinai and the Red Sea, and on the east by Jordan and the Dead Sea.

9.1.2 Rainfall in this area is seasonal and limited to 3–4 winter months. Precipitation varies from 250 mm in the Northern Negev to 25 mm in the South and East. The west to east rainfall gradient is caused by topographical factors while the north to south gradient results from the increasing influence of the dry westerly winds coming from the North African deserts. As in most desert areas, annual average rainfall may have little meaning for any single year. Wide variations of precipitation are the rule, and in most areas rainfall can vary from year to year from zero to 2–3 times the average. To compound this difficulty there is also an erratic distribution within the 3-month rainy season. All of these factors combine to preclude non-irrigated conventional agriculture in most of this region. Some winter wheat is cultivated in the Northern Negev in an area of 200–250 mm rainfall, taking advantage of the greater effectiveness of winter rainfall as compared to summer rainfall. Even here yields are usually low and complete crop failure is frequent.

9.1.3 Topography, climate and soil type further complicate definition of the region. Altitudes vary from 1000 meters in the central Negev highlands to 400 meters below sea level at the Dead Sea and Arava. Temperatures vary accordingly, with cooler days and often frosty nights in the higher areas and intense heat in the lower areas. In general the Negev is characterized by dryness and high year-around solar radiation. Soils vary from deep loessal deposits in the higher rainfall areas to bare rocky surfaces and sand intrusions in the South. Everywhere signs of acute erosion are visible, resulting mostly from rainfall unabsorbed into the soil, flowing in "flash floods" through wadis into the Mediterranean or Dead Seas and carrying with them an annual load of soil and sediments.

9.1.4 Man's impact is evident in the ruins of ancient settlements, dams and terraces and in the denuded hillsides, the lack of perennial palatable bushes, the rare tree and the rapid erosion. The Negev desert, or at least its northern areas which have a higher rainfall, is to a great extent a man-made desert. Thousands of years of intensive grazing and wood gathering have denuded the countryside and caused subsequent damage by wind and water erosion.

9.1.5 In accordance with national planning policy for the dispersal of the population, efforts were made to find agricultural and industrial bases for settlement. The Negev population has increased from some 14,000 inhabitants in 1948 to over 250,000 in 1975, now nearly 7% of the total population of the country. Over 80% is urbanised but it was agricultural settlement which pioneered the development of the desert and still plays an important role in it.

9.2 Agricultural Settlement

9.2.1 The settlements can be grouped into three general areas with their own specific conditions:

1. *Northern and Western Negev.* These settlements utilize water brought from the north by the National Water Carrier (see 7.2). In addition they have some rainfall enabling them to grow winter grains. Deep loessal soils are prevalent.

2. *Negev Highlands.* In this area rainfall is insufficient for winter crops. Water is available from the National Carrier but in smaller quantities. Recently, underground brackish water resources have been developed from deep drillings. Soils are loessal and sandy.

3. *Arava Valley.* In this area, extending from the Dead Sea to Eilat, only brackish water is available and the average rainfall is about 25 mm. The exceptionally warm climate in this region permits cultivation of vegetables during the entire winter season.

9.2.2 At an early stage emphasis was placed on the preparation of new areas for cultivation. The major research thrust, however, has centered upon the efficient and economical use of irrigation, utilizing both good quality and highly saline water. Sprinkler irrigation was generally used, but in the past years drip irrigation systems have become increasingly popular, particularly when only saline water is available. The development of trickle or drip irrigation in Israel from the initial idea through the field trial stage to the point of widespread usage is an example of how adverse desert conditions can be overcome by the proper use of the methods of research.

9.2.3 Agricultural settlers in these areas, especially in the Arava, have attempted to utilize the climate and geographic features to economic advantage. The warm winters and lack of frost enable them to grow vegetables and flowers which are not available in Europe or in the rest of Israel during that season. This has proved to be an excellent source of income. In the Negev Highlands deciduous fruit trees have succeeded, for they do well in the cold frosty winters and are able to get to market before the remainder of the country and therefore enjoy higher prices for their produce.

9.2.4 One of the most important factors in the success of desert agriculture has been the transport of good water from the north to the desert and the development of local brackish water resources. As this water is sold to the farmer at a price similar to that in the more northern areas, desert agriculture has been able to compete successfully in the market place. Another factor was the availability of long-term low-interest development loans.

9.2.5 The unique communal structure of agricultural settlements in Israel was undoubtedly a key element in their rapid development under such adverse conditions (see 8.2). This structure facilitated more efficient use both of material and human resources. It gave the settlers a greater sense of security and encouraged a more bold and daring approach to change and innovation. Together, the farmers could exert more effective political and economic pressures on the Government and its various agencies. Regional marketing facilities, transport, storage, etc. could be

established among the various settlements, thereby further strengthening their economic position (see 8.4).

9.2.6 The Agricultural Research Organization, closely linked with an active extension service, converted new immigrants with no previous agricultural experience into first class farmers within a few years (see 8.3). To do this it was necessary to control the main factors of production and income so that the farmer quickly learned that industrious efforts would result in profits. This often meant compensation for crop failures due to drought or other natural catastrophes.

9.3 Revegetation for Grazing

9.3.1 Israel is probably one of the oldest and most intensively grazed areas. Many believe that the actual productivity of the Negev was once much greater than it is today, despite the fact that precipitation has not significantly changed during the past few thousand years. Overgrazing and mismanagement may have caused the annihilation of many palatable and nutritive plant species.

9.3.2 The present new pressures of a rapidly increasing population, as well as the use of irrigation systems, have intensified the tendency for erosion by disturbing the equilibrium achieved through past centuries. The limited amount of rainfall usually occurs in short intense storms. The direct action of the rain on the denuded soil causes a puddling effect, resulting in a low infiltration rate. The rain water swiftly drains away into wadis which flow to the sea carrying with them tremendous amounts of soil. In this way not only is water for plant growth lost, but erosion occurs at an accelerating pace. Hence it is important to revegetate as much of the area as rainfall conditions will permit, so as to break the cycle of denudation and erosion. Revegetation with drought-resistant perennial fodder plants increases the present animal carrying capacity of the area. Integration of these plants into a properly managed pasture system assists in overcoming grazing problems in the critical period of the annual cycle and in severe drought years.

9.3.3 After initial experiments, the Research and Development Authority of Ben-Gurion University introduced various species of perennial bushes from Australia and the U.S. which have proven their value for fodder production in the desert. Australia, as a relatively new continent, has not undergone the long history of overgrazing found in the rest of the world, and hence offers a particularly good choice of palatable drought-resistant fodder bushes. Hundreds of different plant species were grown in nurseries and examined for their drought hardiness. Successful species such as salt bush, blue bush, acacia and others were planted in larger plots in various parts of the Negev. After a period of breeding and selection, these plants were established without irrigation in the Beer-Sheva area, where rainfall rarely exceeds 200 mm per year. The bushes grew into a verdant jungle of green matter and were eagerly grazed by sheep and cattle. As perennial bushes they managed to exist through two drought years so that replanting was not necessary. The sheep and cattle thrived on these plants alone and needed no additional feed. Strict manage-

ment procedures were instituted in order not to repeat the damaging effects of overgrazing. This experimental program is now ready to be investigated for its economic potential and feasibility for raising sheep and cattle over a wide area of the northern Negev. The techniques developed in this program could undoubtedly be profitably used in many desert areas throughout the world.

9.3.4 Many new plant species are being investigated for their value as sources of industrial raw materials as well as for fodder. This would include vegetable sources of oils, waxes, hormones and other substances of possible pharmaceutical value. At least one plant species is ready to go into commercial production and should add additional perennial plant cover for a large area. A small amount of saline water where available will often have to be added in especially dry years. However, the criterion for choosing these plants is the optimum income-to-water-use ratio. Many species require long hot and dry periods for the production of the useful component. Hence properly chosen plants can be utilized to stabilize the soil, produce an economically viable product and, at the same time, add to the aesthetic appearance of this harsh environment.

9.4 Industry and Mining

9.4.1 Agriculture will not be sufficient to supply employment and sustenance to more than a small fraction of the planned population. Unfortunately, the Negev Desert is poor in natural resources. The Israel Geological Institute undertook a large-scale prospecting program in order to inventory whatever mineral resources do exist. The region has been well mapped and the various geological formations thoroughly studied and on the basis of this work several mining operations were undertaken. These include copper, phosphates, clays and sand in addition to various minor building materials. The Dead Sea has proved to be a major source of raw materials, the most important being potash fertilizer. In addition bromine and magnesia are being extracted.

9.4.2 Mining and export of minerals was an important activity during the first phases of industrialization, but the future development of the area calls for the use of these minerals for the manufacture of more sophisticated products. This type of activity provides employment for more people with added income and profits. Hence, development of a chemical industry was planned and steps taken to get it started. Government and Histadruth (Labor Union) investment companies were established to manufacture products based on the natural resources of the region. These included bromine compounds of various sorts, ceramics, refractories and various pesticides. At a later stage phosphoric acid production was started, utilizing Negev phosphate deposits and magnesia produced from Dead Sea minerals. A large glass bottle plant was set up as well as various plants producing wall and floor tiles and other building components. In this way a second generation of industry was developed, based on the original mining operations.

9.4.3 In addition, the Government extended special concessions to investors who set up their manufacturing facilities in the development towns of the Negev. These conditions included long-term low interest loans and various tax advantages. Various textile and metal working factories were established as well as maintenance and service units. Small businesses were quick to spring up in the wake of the large enterprises.

9.4.4 Industry could have played a greater role in the past development of the Negev, and it undoubtedly will do so in the future. Already new construction is underway which will double and triple industrial output within the next few years.

9.5 Living Conditions

9.5.1 The demand for a more aesthetically pleasing environment has grown recently following the general rise in cultural and economic standards. Landscaping is particularly important in new urban communities where the barren surroundings can be a cause of psychological stress. The Research and Development Authority is now studying plant growth and gardening problems in the new development town of Arad, where landscaping has encountered a number of soil and wind problems. In this particular case, an additional complication arises, for Arad is an asthma treatment center and strict regulations have been adopted restricting the introduction of pollen-producing plants. Similar work on the shores of the Dead Sea has recently started.

9.5.2 A further aspect of desert life for which no satisfactory solutions have been found is the design of appropriate housing. In most desert areas the climatic problems associated with housing have found a satisfactory answer only in those societies which are either extremely primitive or economically very advanced. The Bedouin tent deals with many aspects of the climate quite adequately, and modern air-conditioning provides comfortable living conditions for those societies which can afford it. There does not seem to be a viable solution for middle-income groups in the desert areas of developing nations. Housing has been planned and built with little consideration for climatic conditions, resulting in an excess heat load in apartment units and factories. Little research is being done on this problem in Israel, or anywhere else for that matter, and present techniques are inadequate to solve it.

9.5.3 Whereas mechanical air-conditioning is becoming more common, heat loads on buildings are so high as to make this type of cooling unattainable for the majority of the population. Even if it were to become economically feasible to introduce widespread mechanical air conditioning, the increased electrical generating capacity needed for such a system raises other problems – such as air pollution, thermal pollution, an expanded power grid and power failures – that leave its desirability an open question.

9.5.4 It is often forgotten, on the other hand, that winters in large parts of the Negev can be chilly. While there are few hard freezes, low night temperatures of

1–5°C in some areas are not uncommon in December, January and February. Housing solutions suitable for tropical areas cannot therefore be simply transplanted to the region. Indeed, many inhabitants consider the problem of cold, damp winters as important as the stresses of hot, dry summers.

9.5.5 The original towns built in the Negev hardly took into account the specific climatic conditions of the region (see 13.3). Most of them were planned on a similar basis to the more northern cities and towns of Israel. Space was not considered to be a limiting factor and the result was a spread-out, diffuse, low population density layout which exposed the inhabitants to excessive radiation and caused high heat loads on buildings. Little shelter was provided from the dessicating winds and dust storms. Large quantities of water were needed for landscaping the open areas between buildings and the plant species used were often sensitive to salinity and long dry periods.

9.5.6 The lessons of this failure were quickly learned. Existing towns began to fill in their empty spaces with large tenements and new planning called for higher population densities with sheltered areas sandwiched in among buildings. The new development town of Arad is an example of this kind of planning and is considered by its inhabitants to be a successful answer to the harsh conditions of the Negev. The critical factor of water use is causing a reconsideration of landscaping and gardening and already several settlements are contemplating replacing their plants and trees with more drought-hardy species. The use of saline and waste water is also being considered for this purpose.

9.5.7 The problem of human health and work efficiency in a hot environment still remains an open field for research. Many problems of poor efficiency and specific health hazards due to heat are known. They include changes in sweat rates, salt excretion, hormonal balance, diet and behavioral patterns.

9.5.8 In general healthy humans adapt well to desert climates and if simple precautions are taken no widespread health hazards are apparent. It is known that many ancient civilizations developed in the desert due to a lower incidence of diseases as compared to more humid areas.

10.0 A CASE STUDY OF THE LACHISH REGION

10.1 Background

The Lachish Region development project can be regarded as a model of comprehensive rural regional settlement. In 1953, the first efforts to find an alternative to the established practice of creating isolated, self-contained, and dispersed settlements were made, and in 1954, a decision was taken to establish an entire regional structure in an area which was comparatively large and sparsely settled. At that time, large numbers of immigrants were entering the country and had to be settled, preferably not in the existing centers of the population. There were shortages in

industrial crops, and a need for a sharp increase in agricultural production to overcome the balance of payments deficit. The only natural resource of the Lachish Region was land, but of a total of 100,000 hectares, only some 40% was arable. Even this had not been cultivated because of the severe lack of water until the National Water Carrier (see 7.2) brought water to the area from the North.

10.1.2 The three primary goals set out for the settlement of the Lachish Region were:

1. To absorb and integrate immigrants from traditional societies into the Israeli economic, social and physical background.

2. To settle the sparsely populated Lachish Region as densely as possible, consistent with its economic potential.

3. To contribute to the national effort of overcoming international trade imbalances through import substitution and agricultural or agriculture-based exports.

10.1.3 There were three major social problems in implementing the project. The first was the problem of training new immigrants from traditional societies to become modern farmers, able to manage a complex farm economy and to run a village community on modern cooperative principles. The second was the need, within a reasonable period of time, to overcome the cultural barrier between the veteran population and the new immigrants, on the one hand, and between the different cultural groups among the immigrants, on the other. The third problem was that of attracting technicians, experts, and public service workers to live in the new area and help it achieve an accelerated rate of development.

10.1.4 In order to facilitate its planning and implementation, the Lachish Region was given the status of an independent administrative unit. A number of permanent and ad-hoc committees were set up for the purpose of coordination with other agencies and government ministries connected with the project. A special inter-disciplinary regional team carried out the planning and implementation work on a continuing basis. This team lived and worked in the Lachish Region, and had the authority and the budgetary means to adjust plans and the methods of implementation to changing local conditions.

10.2 Key Features of the Plan

The Composite Rural Structure

10.2.1 A pattern termed the "Composite Rural Structure" was chosen as the basic physical framework for the region. In its expanded form, this structure featured three basic settlement levels: the farming village, the rural service center, and the rural town (see 8.4). Four to eight villages, each comprising about 80 families, were clustered around a rural service center. Several such centers, in turn, were clustered around the rural town (see map).

10.2.2 The rural service center was not more than 5 kilometers from each of the villages which it served. The only services within the agricultural villages were those which must be within easy walking distance of the farmer's home, such as a grocery, kindergarten, small infirmary and synagogue. All other services, such as marketing, sorting, and packing of produce; agricultural machinery stations; shools; health services, entertainment and cultural services were concentrated in the rural service center (see 8.6). It was hoped that the rural service center would attract qualified and skilled personnel to live and work in the rural environment.

10.2.3 The composite rural structure was designed to enable each village to be settled by immigrants of a common cultural background. Cultural homogeneity within each village, it was hoped, would provide for a feeling of closeness and unity through the preservation of traditional ties, thus enabling the establishment of communities based on mutual aid and responsibility. Contact between settlers from varying backgrounds was at the rural center, where children from the various villages attended school together, and settlers met at the center for services.

10.2.4 The regional town, Kiryat Gat, (originally planned for a population of 8,000) was the center for the major processing plants of the agricultural produce of the region, and contained all administrative, economic, and cultural services for the entire region (see 14.0).

The Moshav Family Farm

10.2.5 Of the three existing types of cooperative farming settlements, the Lachish Region planners gave preference to the moshav, as the collective structure was completely alien to the new settlers. Immigrants were brought to the villages immediately upon their arrival in the country, and without any previous vocational or ideological preparation. To help them adapt to cooperative family farming, they initially assumed responsibility for a small part of their land only. The residual area within each village was managed for a period of 2 years as a large "administered" farm, on which the immigrants were employed as laborers. By this means the settlers were assured a stable income – i.e., an income which was not subject to the risks involved in agricultural production – until they were adequately trained as farmers. This system also safeguarded the large investments from inexperienced management. With time, through an intensive agricultural extension program, the settlers gained experience in farming and an understanding of cooperative administration.

10.2.6 The general physical layout of the village adapted for the moshavim in the Lachish Region represented a departure from the past. Previously, the moshav had been planned as a compact and largely self-contained village comprising "one plot family farms". A more intensive use of machinery and its efficient application to larger land units were a pre-condition for lowering production costs and ensuring profitability. Individual farm holdings were too small for large-scale mechanization, so a pattern was devised which would group individual plots under the same crop. The area adjacent to the farmer's home was reduced to 0.25–0.8 ha. The distance between houses was fixed at 30 meters. The remainder of the farmer's holding

consisted of several plots, none of which was necessarily adjacent to his house. Individual plots under the same crop were laid out in large blocks, enabling cooperative utilization of machinery, aerial spraying, and the exploitation of other modern farming techniques. This layout and the transfer of services to the rural center, enabled the planning of a much more compact residential area in the moshav which was also important for security.

10.2.7 The type of farming in the Lachish Region was determined by natural conditions and by the requirements of the national economy. The settlements founded before 1954 in the western sub-area had been primarily dairy and citrus farms, with family holdings of 3 ha. Later settlements in the large eastern sub-area were the field-crop type, with family holdings of 4 to 5 ha. The development of the field-crop farm type represented a break with the previously prevalent diversified family farm. The field-crop farm was planned to be entirely irrigated and to comprise primarily industrial crops and vegetables. Where suitable conditions were available, fruit plantations, mainly citrus, were added as a subsidiary branch. In the eastern hilly sub-areas, extensive farms of 15–20 ha per family were established with sheep and cattle raising on the natural pasture of the slopes, and cereal cultivation in the valleys. Where suitable conditions prevailed, fruit orchards were added.

10.3 The Process of Settlement

10.3.1 In order to be ready in time for the absorption of the immigrants, the planners had to complete their work in only one year. During this period, all the basic data of the region were gathered, and detailed topographical and soil surveys were made; the boundaries were laid down for the sites to be settled, and detailed planning of each settlement was completed, including the network of roads, water pipes and all other necessary services. During the same period, plans were drawn up for employment, and for the agricultural crops to be grown during the first year of settlement.

10.3.2 Implementation of the settlement project started in mid 1955, in accordance with a tight, detailed schedule. On average, a new settlement was established every fortnight and within just over a year, 26 new settlements were founded, including the agricultural settlements, training farms, rural centers and the regional town of Kiryat Gat.

10.3.3 Within two years, from mid 1955 to mid 1957, some 11,000 people had been absorbed in the development area; 5,000 in the rural settlements and 6,000 in the regional town of Kiryat Gat. By 1974 the rural population in the settlements established during 1955–56 reached 8,000 and the population of Kiryat Gat amounted to 23,000.

10.3.4 The establishment of new settlements in the region was in fact completed by late 1956 and from that period onwards all efforts were directed at the socio-

economic development of these rural settlements and the further development and growth of Kiryat Gat.

10.3.5 The income of the average farming family in the region had already reached the national average of agricultural families in Israel by the year 1965, and since then, incomes have been rising parallel with the growing income and standard of living in the country.

URBAN SETTLEMENT

11.0 Introduction

11.1 Whilst the level of urbanization in Israel reaches 84% (see 2.2) the planning and establishment of urban settlement has continually lagged behind the highly developed rural administrative structure. The cities grew, and with that growth came all the problems familiar to congested urban centers all over the world. There are problems of deteriorating areas, needing rehabilitation or renewal; there are problems of environmental degradation as a result of traffic congestion; there is a lack of urban open space – and so on. In these aspects, Israel is no different from many other industrialised countries. However, there are some aspects of Israeli urban settlement policy which have been successful and could serve as examples for other countries.

11.2 The most outstanding characteristic of Israeli urban settlement policy is the establishment of 29 new towns in the underdeveloped parts of the country in the context of a population dispersal policy. This innovative policy changed the structure of urban settlement in the country. The highly centralised planning machinery of the country (see 4.0) enabled the policy to be implemented, and the influx of immigrants provided the first inhabitants for the new settlements.

11.3 In the face of an extremely rapid rate of urban development, attention was turned to conserving the older parts of cities. Conservation policies and projects have aimed to maintain links between present and past phases of settlement, to bring back into active use areas which had fallen into disrepair, and to enrich the visual character of the urban fabric by protecting a variety of building styles.

11.4 The third aspect of urban settlement policy covered by this report is the approach to metropolitan planning. Of the 3 metropolitan cities of Jerusalem, Tel-Aviv and Haifa, most effort has been put into the first, as the capital city and also as an urban center of worldwide interest.

12.0 POPULATION DISPERSAL POLICY

12.1 The pattern of urban settlement

12.1.1 The present pattern of urban settlement in the country is of very recent origin. A century ago, the main population centers were quite different, except for Jerusalem which has always been an urban center. During the 19th century the settlement pattern followed two major axes. One was along the ridge of the north to south mountains, constituted by Zefat, Nazareth, Genin, Nablus, Ramalla, Jerusalem, Bethlehem and Hebron. Each of these was the marketing center of an agricultural hinterland. The other axis lay along the coast, being composed of Akko, Jaffo and Gaza, all harbor towns for fishing and international trade. Towards the end of the century, the total population of the whole country was only about 350,000.

12.1.2 The pattern changed rapidly during this century, when mass immigration of Jews and rapid natural increase brought the population level to over 800,000 in 1948 and to over 3.5 million today. The basis for the present pattern of urban settlement was already laid by 1948. Two new cities had been created – Tel-Aviv and Haifa – and Jerusalem continued to be a major center. Though there were 400 settlements in the country, 67% of the population was concentrated in 3 of them, and 43.2% in Tel-Aviv alone. The result was a settlement pattern with a sharply primate structure, consisting on the one hand of medium and large sized urban centers, generally clustered together, and on the other, a large number of small rural settlements scattered over the country. Some of the factors that contributed to this primate structure were:

1. The immigrants, who constituted the main source of urban growth, preferred the large cities where better opportunities for employment prevailed.

2. The rural sector was, from the beginning, organised to deal directly with the large cities, without the need for intermediate towns.

3. There was no assistance from the national Government for the creation of urban settlements in magnitude and resources to the national efforts in the rural sector.

12.1.3 Some considered this primate structure an inevitable outcome of circumstances, when rapid communications in a small country removed the need for intermediary centers between the rural settlements and the major cities. The Planning authorities did not accept the inevitability of the primate pattern and sought to change it. The planners considered that the primate pattern was only suitable for the initial stages of economic development and would be unable to function effectively in a more densely populated and intensively developed country. They chose a European model as their ideal, based on a theory of close cooperation between regional urban centers and their rural hinterlands. The model consisted of a spatial and functional hierarchical network of urban centers, supplying services to their rural surroundings. To change the then existing primate structure to the desired network of small and medium urban centers throughout the country, the planning department recommended a policy of population dispersal. This policy received government approval and though it has been revised over the years, its aims still form a basic framework for development planning in the country.

12.2 The aims of population dispersal

12.2.1 The change in the settlement pattern was effected by a deliberate policy of urbanization, guiding the location and growth of settlements throughout the country.

Its aims were:

1. Settling sparsely populated regions in order to overcome regional imbalance of development.

2. Occupying frontier regions for purposes of defense as well as to establish national presence and sovereignty over these areas.

3. Opening "resource frontiers," mainly natural resources in the desert areas in the southern part of the country.

4. Changing the primacy structure of the urban system by limiting the growth of urban concentration in the central coastal plain and establishing the missing level of medium to small towns.

5. Building integrated regional systems by planting urban service centers in each rural region, thus creating a complete, hierarchical urban system.

12.2.2 The policymakers and planners who formulated the national goals to be achieved by urbanization policy gave a much stronger emphasis to social values than to economic efficiency. Basic economic goals, like achieving and maintaining a high rate of economic growth, were not prime motives.

12.2.3 Among the motives emphasized was a deep-rooted anti-city ideology, which was a strong factor behind the goal of altering the dominance of Tel-Aviv in the urban structure. The objection to the primacy structure, expressed in a policy to limit the growth of Tel-Aviv, stemmed not only from the usual economic arguments of diseconomies of scale in production and distribution and of rising costs of public services, but also from an emotional and ideological discontent with living in large cities. This discontent carried over from the prevailing attitude of British planning of the thirties and forties, which had a deep influence on Israeli planners.

12.2.4 National security and geo-political considerations were decisive factors in establishing the goals of settling border regions and avoiding regional inequalities in development which might result from large empty areas not being settled and occupied. The goal of opening the "resource frontier" was based on expectations of rich mineral resources in the arid areas. The goal of building integrated regional systems was based on a "regionalistic" concept of an area of distinctive identity and character, almost self-contained in its services, with strong relationships between urban and rural settlements. This goal was also motivated by assumptions of a more efficient system of distribution of services which might be achieved through a well-developed hierarchical structure. An additional factor was the conflict between urban expansion and agricultural production in the fertile coastal plain. The goal of restricting urban growth in this area was linked to protecting agricultural soil and to transferring urban development to areas not suitable for agricultural production.

12.3 Means of implementation

12.3.1 The dispersal policy was implemented by a series of 7 national plans over the period 1948–1967, with target populations ranging from two million in 1948 to four million in the 1967 plan.

12.3.2 The first plans were based on the principle that the existing primate pattern had to be supplemented by the insertion of three intermediate grades of rural and urban centers. The first grade of this planned hierarchical pattern, was the rural service center with only a few hundred inhabitants (see 10.2.1–10.2.4). The second, was a rural town, designed to serve a district with an average diameter of 12 to 20 kilometers. The third grade was the regional town with central regional institutions and services and a variety of manufacturing enterprises.

12.3.3 The plans designated the location and population size of each settlement to a target date of 10 to 15 years ahead. The hierarchy of centers was only a guiding scheme: it underwent considerable changes and adjustments during implementation.

12.3.4 There were three main functions of the plans: they served as frameworks for the population targets of local plans; they were used by government institutions as a guide for the future location and size of various institutions and services; they were used as a guide by government institutions for the allocation of industrial development, the construction of public housing and the assignment of targets for immigrant absorption. The basic assumption was that employment would follow the population. Economic incentives were offered to encourage investment in the new settlements but the plans assumed that most sectors of economic activity would adjust themselves to the distribution of population, due mainly to the decreasing dependency of industry on the location of raw materials, the growing importance of the tertiary sector, the small size of the country and its developed transportation network. Hence, the critical importance of specifying a target population for the regions and of providing housing as the main instrument in the implementation of the plans.

12.3.5 The first phase of the dispersal of population, during 1948–1956, was directly connected with the spread of new rural settlement. Since 1956, the dispersal of population has become more and more a function of industrial investment, and of the dispersal of manufacturing industry promoted and subsidized by the Government. In 1963 a Special Inter-Ministerial Commission for the Dispersion of Population was established because of the failure of the measures up to that time to reduce the large population concentration along the coastal belt. The Commission's objective was to distribute 30–40% of the population away from that area by diverting 40% of the natural population increase and 60% of the immigrants into these development zones. Among the Commission's additional recommendations were the attraction of veteran Israelis, and of industry, away from the coastal belt; the desirability of achieving a minimum population of 10,000 in each new town; the setting up of priority zones to encourage the development of backward areas; and no planning of any further new towns.

12.4 Degree of success in dispersing the population

12.4.1 The plans have achieved quite a considerable measure of success, though

there is still a heavy concentration of population in the coastal belt and particularly in the 3 major cities.

Population Distribution (%)

Region	1948	1961	1974
Jerusalem	10.2	8.8	11.2
North	16.8	15.5	15.3
Haifa	20.5	17.0	15.1
Central	14.3	18.7	18.8
Tel-Aviv	35.7	32.0	27.8
South	2.5	8.0	11.8
Total	100.0	100.0	100.0

In terms of the redistribution of the population, the dispersal plans have been successful in reducing the primacy of Tel-Aviv, and in establishing settlements in the north and south of the country. The policy has been noticeably more successful in bringing development to the south than to the north.

12.4.2 As a deliberate policy of urbanization, the plans have also achieved considerable success in establishing a large number of small and medium-sized towns throughout the country. The emphasis, however, on the need to establish small towns has resulted in the creation of a large number of settlements which are too small to function effectively without continuing government assistance. The decision of later plans was therefore not to found any more settlements but to concentrate on increasing the size of the existing new towns.

Number of New Towns in the Size Group and Percentage of Inhabitants of All New Towns

Population Size Group	1961	1967	1972
Under 10,000	18 29%	15 20%	13 15%
10,000 to 20,000	5 25%	8 28%	9 27%
20,000 to 30,000	3 28%	3 18%	3 15%
30,000 to 40,000	– –	2 17%	1 7%
over 40,000	1 18%	1 17%	3 35%
Total Number of New Towns	27 100%	29 100%	29 100%

12.4.3 Over the past 20 years, the population of the underdeveloped regions of the country has been increased, though the population dispersal policy was far more successful in the south than the north. New towns were the main agent in the policy to change the country's settlement pattern, and today they contain nearly 20% of the total population of the country.

12.5 The present population dispersal plan

12.5.1 The present plan for a target national population of 5 million by 1992 follows the same general goals as its predecessors, and includes the following:

1. to increase the northern region's share of the national population;

2. to continue the growth of the southern region;

3. to strengthen Jerusalem as the capital city and as a spiritual, cultural and tourist center;

4. to reduce further congestion in Tel-Aviv and the coastal plain;

5. to encourage the growth of the new towns already established under the preceding dispersal plans;

6. to maintain a balance between the rural and urban sectors of the population.

12.5.2 The plan was prepared jointly by the Planning Division of the Ministry of the Interior and the Economic Planning Authority of the Ministry of Finance. It attempts to base the population target, mainly for the regions, on a generalized economic analysis of their growth potential. This adds an economic dimension to the plans which were previously concerned only with spatial distribution.

Planned Population Distribution

Region	Population distribution in 1974	Target for 1981 (or a population of 4 million)	Target for 1992 (or a total population of 5 million)
Jerusalem	11.2	12.5	12.8
North	15.3	15.6	16.0
Haifa	15.1	15.0	15.4
Central	18.8	17.4	17.4
Tel-Aviv	27.8	26.6	24.3
South	11.8	12.1	12.8
Total	100%	100%	100%

12.5.3 The plan does not propose to change the present pattern of settlement, but to strengthen the weak links in it. It recognises that some of the new towns have not achieved an adequate size or economic level, but does not propose to abandon them. It does not propose a standard optimal size, but allocates population growth according to the physical capacity of areas suitable for residential development.

12.5.4 The plan recommends the following means of implementation:

1. Follow-up by an inter-ministerial committee.

2. Division of the country into priority areas, as a framework for the activities of all government ministries.

3. Regional allocations of development and government budgets.

4. Regional planning for every region and settlement.

5. Decentralization of government services and public institutions.

6. Land policy in the administration of national lands, in harmony with the goals of the plan.

7. Encouragement of foreign investment in development priority areas.

8. Incentives for settling in development areas and an increase in publicity of available opportunities and increased financial incentives such as tax relief.

12.5.5 The main difference between this and previous plans is in its official status. The previous plans were merely guide-lines without formal and legal status, but this present plan has been prepared as a "National Plan" according to the directives of the National Planning and Building Board (see 4.1.1).

13.0 NEW TOWNS

13.1 Aims of the new towns

13.1.1 One of the main aims of the new towns was as a means of implementing the population dispersal policy. Theoretically there were three possibilities: the development of existing rural settlements into urban centers, the expansion of small and medium-sized towns, and the founding of new towns. For idealistic and practical reasons the majority of the rural settlements were not suitable for urbanization since their collective or co-operative form of organization does not allow for a great extension of membership. The second possibility was in fact implemented but the pattern of existing settlements did not comply with the desired regional redistribution of population. The main means of implementation was therefore the founding of new towns.

13.1.2 The second aim of the new towns was as service centers for their rural hinterland. They were expected to be the centers of regional administration, marketing facilities for agricultural products, commercial outlets to serve the region's consumption demand, health and education facilities, and employment for off-season, under-utilised or surplus agricultural labor. It was hoped that in their role as regional centers, they would encourage closer contacts between the urban and rural sectors of the population.

13.1.3 The third aim was to provide good living conditions for new immigrants and enable them to integrate into the life of the country.

13.2 Establishment of the new towns

13.2.1 In selecting sites for the first new towns, the planners chose some with favorable topography and landscape, but this often resulted in remote sites on hills and mountain slopes. Other sites were selected as urban centers for a rural hinterland, and were located at the cross-roads of the regional traffic routes and at the focus of economic activity.

13.2.2 By 1952, nine first generation new towns were in operation, but their capacity to continue to absorb immigrants was limited by two major factors: a very low standard of infrastructure and public services which made rapid growth difficult: and poor locations for either industrial development or for building up the settlement hierarchy. When the second generation of new towns was built in the mid-1950's their locations were carefully chosen to meet the needs of population dispersal and regional development. By 1957, another 18 new towns were established, mostly on new sites in the inland and border regions, housing a population of over 200,000. Since 1957, only two new town have been built: Arad in the Negev Desert and Karmiel in the Galilee hills (see map). They represent a significant shift in policy in that they are not specifically designed for immigrants, but aim to attract the middle-class, native-born Israeli.

13.2.3 Planning and development of the Israeli new towns involves a large number of authorities as there is no statutory framework for the administration of new towns such as the New Towns Act in England. Planning of the new towns is subject to the general planning and building legislation of the country, and housing is almost exclusively constructed by the Ministry of Housing. Even in the most advanced new towns, such as Beer Sheva or Ashdod, up to 80% of all dwellings are built by the Ministry of Housing and it reaches 100% in the smaller towns and those inhabited entirely by new immigrants, where a housing market is practically non-existent.

13.3 Design of the new towns

13.3.1 The design of the new towns, particularly during the initial period 1948–55, reflected the influence of the British school of civic design of the thirties and forties. This followed the "garden-city" movement, stressing low densities, a semi-rural character for urban development and self-contained neighborhood units separated from the town center by wide strips of open spaces, cultivated or wooded areas. Allotments and gardens were included in the plans for "ideological" reasons and as a quasi-economic basis as the towns suffered from limited employment opportunities at first. Such generous "green spaces" proved to be of limited practical value under Israeli climatic conditions (see 9.5.5, 9.5.6).

13.3.2 The result was extremely dispersed urban development, still apparent today in several new towns. Distances within the towns were considerable, costs of infra-

structure and development works were high, and a lack of "urbanity" – both physical and social – was an outstanding feature of the first new towns.

13.3.3 There was a decisive change in practice in 1958–59, after which the prevalent single-storey houses were replaced by apartment blocks of three to four storeys, and in some cases of eight, ten and even sixteen storeys. The increase in building densities was followed by a change in the lay-out of the towns to a more rigid and compact design, with straight lines, which reflected land values, development costs and engineering consideration.

13.4 Degree of success of the new towns

13.4.1 The role of the new towns in the context of the national policy for population dispersal has already been described (see 12.4.2, 12.4.3). In quantitative terms, they achieved a fair degree of success, though some have remained too small to be economically viable without continuing government support.

13.4.2 Their role in immigrant absorption has been fairly successful, particularly in the light of what could have been the alternatives. The immigrants were provided with decent housing almost immediately on arrival in the country. By present standards, this housing is now considered inadequate and is often overcrowded, but the alternative could have been the crowding of the immigrants into the large cities. There is no doubt that their housing conditions in this case would have been far worse.

13.4.3 The settlement of the immigrants in small towns gave them the opportunity to participate in the administration of local affairs and the political life of the community. Over the years, the immigrants gained experience in local government and are now a vocal group in the country's affairs. Had they settled in the large cities, there would have been little chance for them to participate to such an extent.

13.4.4 The creation of the new towns added another choice to the alternative life-styles in the country. Previously the choice was between the major cities and the rural farming settlements. The new towns added the opportunity of urban life in a small community. This is now gaining popularity, as shown by the waiting-lists of people requesting housing in some of the new towns.

13.4.5 The new towns succeeded in encouraging and enabling the exploitation of local resources in the underdeveloped regions of the country but they did not immediately become regional service centers. One reason is that in Israel the rural areas are often more economically and culturally advanced than the new towns. Another reason is that communal and cooperative rural settlements are members of strong national organizations, which arrange marketing and purchasing on a national scale through their headquarters in Tel-Aviv. The result is that there is almost no demand on the new towns for regional services. In many cases, the level of services

provided by the rural settlements through their national organization is much higher than the services available in the new towns. It is only in those areas where the inhabitants of the rural settlements are new immigrants that there is a demand for the regional services of the new towns. This explains the relative success of some of the new towns in the southern region of Israel as service centers, as the rural settlements are those of new immigrants with a high degree of ethnic compatibility with the inhabitants of the urban centers.

13.4.6 Other reasons help to explain the operational difficulties of the planned hierarchical structure. The small size of the country, the well-developed road network, and cheap public transportation brought the large cities into easy reach of almost all rural regions, thus diminishing the demand for local services. The small size of many new towns did not enable the provision of central services above a minimal level. Despite the designation of many of the new towns as service centers, the Government did not support, by any type of incentives, the development of commercial and service activities. The combination of low demand from rural settlements for central services from new towns and the limited supply of these services offered by the small towns resulted in weakness at the lower levels of the planned urban hierarchy. The smaller new towns were unable to develop the planned economic base of central services and sought to acquire industry. Many new towns became one-industry towns, subject to the vulnerability of cyclical decreases and to technological or demand obsolescence.

13.4.7 There are signs that some of the larger new towns are becoming service centers. It has taken about 20 years for the towns to achieve a size that can offer a level of services which do attract the rural settlements of the region to use them in preference to dealing directly with the major cities.

13.4.8 The present population dispersal plan aims to help the struggling new towns, and there is an Interministerial Committee for New Towns which now decides on investment policy and includes improving employment opportunities and housing conditions.

14.0 KIRYAT GAT : CASE EXAMPLE

14.1 The development of the town

14.1.1 When the development of the Lachish region was planned (see 10.0), Kiryat Gat was designated as its regional center. The town was to be the top of the hierarchy of service centers providing the main administrative and commercial services for the surrounding area. The town also fitted in to the national plan for dispersal of the population as one of the medium-size settlements in a sparsely populated area.

14.1.2 The new town was established in 1954, and within ten years, had exceeded its original target population of 10,000. Economically, it is one of the most success-

ful new towns, although its employment base is not as originally planned. The town was expected to be the industrial processing center for its agricultural hinterland. The major industries are sugar refining and textiles, both of which use some local produce but most of their raw materials are imported. Nor has Kiryat Gat fully fulfilled its planned function as a regional service center, for many of the rural settlements use services elsewhere, either in the nearby town of Ashkelon or in the major cities.

14.1.3 However, Kiryat Gat as an independent settlement, not as the center of the Lachish region, has been highly successful in attracting population and in time may well become a regional magnet. It has now over 21,000 inhabitants and the new masterplan is to a target of 80,000 by the beginning of the next century.

14.1.4 The original design of the town followed the "garden city" concept of low densities and large open spaces (see 13.3 and 9.5.5). Such a design was not very appropriate to a semi-desert environment nor to the needs of the population who became its inhabitants. The result was a very spread-out settlement, lacking in urban character, and not adapted to the climatic conditions of the area.

14.1.5 A new plan, prepared for the far larger population level, sought to correct the earlier mistakes. Firstly, it recognised that Kiryat Gat had to be planned on its own, without relying on obtaining produce and labor from and providing services to surrounding settlements. The new plan sought to strengthen the town, and assumed that in time, as the town grew and the purchasing power of the surrounding settlements rose, the town would automatically become the regional center. The new plan also corrected the mistake of the inappropriate physical design of the residential development. It proposed future development which was well adapted to local conditions, using the small topographic variations and climatic conditions to advantage.

14.1.6 In preparing the new plan, the team paid particular attention to the social characteristics of the population. The inhabitants were largely of North African or Asian origin, with needs that were different from families of European origin. The needs of the different communities and ways of integrating them were the subject of an experimental housing design, the integral habitational unit.

14.2 Integral habitational unit

14.2.1 The Kiryat-Gat experiment in establishing an integral Habitational Unit, was the first attempt of its kind in Israel to shape the physical appearance of a residential quarter in accordance with the findings of a sociological study. The idea of the Unit originated with Le Corbusier, who applied the term "unite d'habitation" to vast residential blocks, containing numerous types of dwelling units and public institutions. The idea was elaborated and developed by the municipality of Rotterdam and elsewhere. In Israel, the Unit is of special interest, as community integration is an important national aim.

14.2.2 The Integral Habitational Unit is an attempt to achieve unity in diversity. It tries to overcome the regimentation of population and the uniformity of mass housing by creating diversified residential units which can accommodate a wide range of population groups and where life would be stimulated by the economic and social diversity of the inhabitants. On the one hand, it was hoped that population diversity would enrich and strengthen community life, but on the other, the planners were aware of the risk of social friction. The project aimed to find the optimum balance among the kinds and numbers of people to be housed, and to create an optimum spatial relationship between them.

14.2.3 Kiryat-Gat was selected as the location of the Unit because it was the center of a planned and well-defined agricultural region which had a relatively clear program for development and growth, and because it had a government structure of young and competent officials who expressed an enthusiasm and a willingness to cooperate in the building and administration of the Unit.

14.2.4 A survey of the current problems of the town revealed that the process of housing immigrants was unsatisfactory. Dwellings were assigned irrespective of the needs of the family; housing was not planned for families of more than 5 persons; and immigrant communities were socially isolated from one another. The town's population included: new immigrants from North Africa; new immigrants from Eastern Europe; Kiryat Gat residents of North African origin; Kiryat Gat residents of Eastern European and Western origin; and veteran Israelis. In analysing the demographic structure of each category, five population characteristics were taken into consideration: the size of the family, the age of the head of the household, the ethnic community, occupation, and the length of stay in the country. Three alternative plans of population distribution were prepared for the Unit, varying in the proportion of immigrants from different regions, and eight types of dwellings were proposed in order to allow for flexibility in housing.

14.2.5 In long, three-storey buildings there were several staircases, some leading to six 2-room flats and 3-room flats. This design enabled families of different sizes to be housed in close proximity, such as the large North-African and small East-European families. These flats had an area of 49 and 64 square meters respectively and by altering the location of the living room terrace in the smaller flat, another dwelling type could be created without substantially changing the original plan. The one- and two-storey houses had separate entrances and enclosed private courtyards. They included 2-room units of 35 square meters and 3, 4 and 5 room houses. They were the first attempt in Israel to provide living accommodation for immigrant families of 7 persons or more. The design of subsequent units included a two-storey house which contained a 3-room flat on the lower level and a 2-room flat on the upper level. The lower flat had an enclosed private courtyard and the upper level flat utilized part of the roof of the lower level as a terrace. This principle has been modified in the design of other housing types. The variety of housing is an attempt to overcome architectural monotony and avoid the regimentation of the prospective population.

14.2.6 Once the types of dwellings for the Integral unit had been decided an attempt was made to establish optimum community relationships from a sociological study. The mixing of different communities had been attempted before, but in a completely unplanned way and resulted in unsatisfactory relations between neighbors and communities. One of the aims of the sociological study was to identify the factors which influence neighborhood relations and it concentrated on four specific points:

a. the structure, composition, and social relations of the population in new towns;

b. the environmental satisfaction of new immigrants in new towns;

c. the veteran Israeli, his function and social life in new towns;

d. the renting and purchasing of dwellings by immigrants.

14.2.7 The study revealed a number of possible combinations of family sizes, age groups, ethnic communities and professions in which good neighborly relations are likely to be achieved. They included:

1. North African and European families of a high social and professional level

2. European families of a low professional and social level with families from Middle Eastern countries

3. North African families of a low professional and social level with families from Middle Eastern countries

4. One family of North African or Middle Eastern origin with two families of European origin.

14.2.8 Despite efforts to assign houses to families of different ethnic communities according to the principles of the sociological survey, some cases of friction and dissatisfaction in the first of the 6 sub-units were reported. The first follow-up sociological survey attempted to identify the source of these complaints, test the original hypotheses on which housing assignments were made and restate these hypotheses where necessary. Despite the importance of the sociological research for the planning and assignment of houses, the sociologists, architects, and government officials have already realized the practical limitations of their work. The arrangements of dwellings throughout the entire Unit according to the desired ethnic combinations would have complicated physical planning beyond reasonable limits. The layout of all houses and flats solely on the basis of sociological considerations would certainly have been at the expense of the design and economy of the buildings. An attempt was made, however, to reconcile as much as possible the physical design with the results of the sociological research. Follow-up surveys will attempt to analyze other dimensions of the population and state ideal combinations in terms other than ethnic composition.

15.0 URBAN CONSERVATION AND RESTORATION

15.1 Introduction

15.1.1 Most urban development in Israel has taken place over the last 50 years. Building was done quickly and cheaply, and in the same style throughout the country, except in older cities like Jerusalem. Faced with the rapid rate of development and the monotonous architectural style of modern building, people became aware of the need to conserve and restore older buildings and areas which had particular historic and architectural value. Attention had been paid to the distant past, in the investigation, protection and restoration of archaeological sites, but it is only in the last decade that attention turned to the recent past. At first, urban restoration was seen as a means of creating areas attractive for tourists. Later, however, the municipalities recognized the possibilities of conserving the urban fabric for the benefit of the local inhabitants.

15.2 New activities in old areas

15.2.1 One of the aims of several urban conservation projects was the introduction of new activities into areas which had fallen into disrepair or were no longer in residential use. The urban fabric was, on the whole, still sound, but had deteriorated through lack of maintenance. This had occurred in the coastal towns of Jaffa and Acre, in the hilltop town of Safed and in the many parts of Jerusalem. Some of the restoration projects used the original urban fabric as the overall architectural style and reconstructed the area in harmony with this style. Some projects kept more closely to the original buildings, and just introduced new uses into the existing structures. Others have tried to bring back the original activities into the areas, but have not necessarily kept to the original style of the buildings.

15.2.2 Jaffa is an example of the first type of project, where reconstruction of the low stone buildings and narrow pedestrian alleys is in the overall style of the original building but has not kept to the detailed structures. The Ministry of Tourism, together with the Israel Land Authority and the Municipality, set up a Development Authority for the restoration of the area as a center for local and foreign tourists. The once residential area is now a center of exclusive shops, art galleries, restaurants and nightclubs. The overall style of the area attracts visitors to wander around the paths, and the redevelopment has been a highly successful commercial venture.

15.2.3 Acco (or Acre) is an example of the second type of project, where new uses were fitted into the existing structures. Whereas the original fabric in Jaffa was not of any particular importance, there were many buildings in Acco which were well worth preserving in their original form. As in Jaffa, a Development Authority was established, and it has introduced tourist and entertainment uses into the area. The "Knights' Halls", part of the Crusader Palace, has been adapted for use as a small concert hall and the old city walls have been reconstructed to provide a promenade.

Further projects are under way to adapt the Governor's House as a youth hostel and to integrate a shopping gallery into the Crusader Sea Wall.

15.2.4 Yemin Moshe in Jerusalem, is a mixture of old and new uses. The area was originally built by Sir Moses Montefiore in the 1860's as a residential quarter, to provide better living conditions for the Jews then living in overcrowded conditions inside the city walls. When the city was divided, Yemin Moshe lay on the border, and over the years conditions there deteriorated. A Development Company was set up to renovate the area, retaining its architectural character and its historic significance. Most of the area was restored to its original residential use, though the size and standard of the houses was raised and it has now become a high-priced area. One row of terraced houses was transformed into a residence for distinguished guests, such as artists, writers and musicians, invited to visit Jerusalem.

15.2.5 The most outstanding example of restoration to the original use but not necessarily within the original building style, is the reconstruction of the Jewish Quarter in the Old City of Jerusalem (see 16.0).

15.3 Conserving individual buildings and sites

15.3.1 The restoration projects tackled whole areas; there are however many individual buildings and settlement sites of historic and architectural value outside these areas which needed some form of protection in the face of rapid urban development. The Ministry of the Interior initiated a survey of sites dating from the middle of the 18th century until 1948, marking some special event or historic development, or typical of a given period, culture or style of life. The majority of these sites date from after 1882, and are typical of the Jewish, Arab and European settlers under the Ottoman regime. The sites have been divided into four main periods: a. From the middle of the 18th century until 1881, comprising the major sites of the pre-Zionist period. b. From 1882 until 1918, comprising the sites typical of the Russian-Jewish immigrants belonging to the "Bilu" movement, and of the so-called "second immigration", to the end of the First World War. c. From 1919 until 1939, comprising the sites typical of the third, fourth and fifth immigration, to the outbreak of the Second World War and the sites reminiscent of the British Mandate. d. From 1940 until 1947, covering the period of the Second World War and the immediate post-war years to the establishment of the State. Some of the sites are of national importance, such as the first house in the Tower and Stockade settlement of Hanita, and the building of the Jewish National Library on Mount Scopus, and some are only of regional or local importance. The sites can be divided into three main types: a. Sites of historic importance, such as the first house built in the collective settlement of Deganya. b. Sites typical of the architecture or style of life of a period, such as the settlements established by the Baron de Rothschild or the Teggart police fortresses erected by the British Mandatory authorities. c. Sites whose historic significance stems from a particular event that took place there, such as the entrance gate to the Miqve Yisrael agricultural school where Herzl met the German Emperor, William II.

15.3.2 Sites in the Tel-Aviv – Jaffa area include groups of houses or typical streets as well as single buildings of a typical structure or connected with particular historic events or personalities. A survey in Jerusalem identified 200 sites of special interest, representing buildings of the last century. Some were constructed by pilgrims of different nationalities such as German, Russian and Armenian, and others by the British Mandate for public purposes, such as the main Post Office.

15.3.3 Sites located in rural areas should be fairly easy to protect as the local population is aware of their significance and willing to rehabilitate them to a condition suitable for visitors. Sites in urban areas will be far more difficult to protect. Some are in inappropriate use and need constant inspection; some have fallen into disrepair; some are at risk from demolition; and some are disfigured by the addition of structures not in keeping with the original character. Moreover, the immediate environment of the sites needs protection too, to provide a proper setting and to enable public access.

15.3.4 In January 1975, the Minister of the Interior was empowered to declare sites of national historic interest as protected areas. According to the law, he can issue regulations for the conservation, maintenance and protection of these sites and put them under the care of the National Parks or the Nature Reserves Authority. However, problems of financial compensation for the owners of the sites have not yet been solved, and the regulations have therefore not yet been issued.

16.0 CASE EXAMPLE: THE JEWISH QUARTER OF JERUSALEM

16.1 The Jewish Quarter in the Old City of Jerusalem has been a residential area for centuries. It was largely abandoned and destroyed following on the War of Independence and it was only in 1967, when it came under Israeli administration, that restoration work could begin. A government authority, the Company for Reconstruction and Development in the Jewish Quarter in the Old City, was placed in charge of its development. Its aim was to develop the Jewish Quarter as a residential area offering public services for its inhabitants and visitors, in keeping with its national, religious, and historic importance.

16.2 The Company first prepared a masterplan, in line with physical, demographic, historic and archaeological surveys, to direct the process of development and construction. The Jewish Quarter has always been a residential area with many synagogues, religious seminaries and a commercial center. The plan aims to preserve the residential character of the Quarter, with housing for 600–700 families and for 1000 to 1,500 seminary students, making a total of 4,500 to 5,000 people. The few synagogues which remained are being restored, new ones are being planned, and some of the religious seminaries have been re-established. The commercial center will be reconstructed as part of the central bazaar area, which is a prominent feature of the Old City. Residential quarters and hotels will be built above an underground terminal planned for parking and services which will be linked to the commercial center.

16.3 Most of the buildings of the Jewish Quarter are one to two hundred years old, with parts even older. It does excel in close stonework, narrow lanes, inner courtyards, arched spaces and domes, which are worth preserving, and reconstruction is being carried out in keeping with the existing style. The work includes restoration of existing buildings, the completion of partially ruined buildings and complete reconstruction of destroyed and evacuated areas. The building material used is rectangular natural stone blocks, processed by hand. The buildings are two to four storeys high, so as not to spoil the skyline, and most of them have inner courtyards. The lanes, 2.5 to 4 meters wide, are for pedestrian-use only, except for special vehicles to service the shops and houses. Paving stones, lighting sources, benches and such details are being designed and built by the Company. The present poor service infrastructure (a holdover from Turkish rule) is being supplemented by a new underground network.

16.4 The architectural guidelines in restoration and reconstruction were:

1. Only stone will be used in building construction in strict compliance with the existing regulation to this effect applying to all of Jerusalem. There is a sharp conflict between the traditional building techniques in the Old City and those available today. The problem is not only financial, but mostly technical – the ability to do the work, the available know-how, and the influence of the techniques and culture of the twentieth century. The use of modern techniques (such as prefabricated elements) was often considered but rejected for several reasons, the principal one being the difficulties of using cranes in the narrow alleyways of the Quarter.

2. The height of new dwelling units is not to exceed two to four floors, in line with existing tradition and to conform with the surrounding townscape.

3. Vehicular traffic within the Quarter will be forbidden. Movement in the Quarter will be restricted to pedestrians. The complex of routes basically corresponds with historic passageways in the Jewish Quarter, to retain the link with the past and with the special character of the Quarter and its alleys. For special duty services, such as garbage collection, fire extinction, ambulances and the transportation of goods, a system of electrically-powered vehicles, easily manoeuverable in the narrow lanes, is being planned.

4. Existing domes and arched structures and especially facades which are of architectonic value are to be preserved.

5. Infrastructure of utility services. A widescale plan was drawn up for various utility services, including drainage and sewerage lines, water pipes, telephone lines and electrical cables, all to be installed underground.

6. All street surfacing in the Old City should follow the original stone-paving pattern. The problem of covering the streets, to enable pedestrians to move freely, even in extreme climatic conditions, has been the subject of several surveys. The complex of alleyways itself has been studied in relation to the problems of drainage

and sewerage. In many places the surface level of the alleys was lowered by as much as two meters below the original level.

7. Layout of new dwellings. The principles of design and planning of housing which have governed building in the Old City for generations are being applied in the present reconstruction. The height of the buildings, the inner complex of passageways and the shared courtyards were all planned according to traditional layouts. Cross-sections of the area and different views were studied, and each detailed plan is checked against a model of the surroundings. Generally, facades of the buildings overlook an internal courtyard, which serves as the entrance to a number of housing units. The progression from private to public space is from the private house, to the common courtyard, to the passageway shared by the public square. Wherever possible, this traditional pattern of building has been retained in reconstruction of new housing units, and entire complexes of buildings, bordered by alleys and interspersed by patios and piazzas, were treated as architectural ensembles.

17.0 URBAN PLANNING: JERUSALEM

17.1 Each of the 3 major cities of Israel have clearly defined functional roles as a result of their historical development. Haifa developed as the main port and industrial city of the country, with a particular emphasis on petrochemicals. Tel-Aviv is the business and commercial center of the country and has for long overshadowed Jerusalem. A main aim of urban policy now is to reinforce the role of Jerusalem as the capital city and as the center of administration.

17.1 The growth of Jerusalem

17.1.1 The population of Jerusalem rose from 45,000 at the beginning of the twentieth century to nearly 350,000 in 1975. Since details of the population composition of the city were known, the Jewish population has always formed a majority, rising from 60% in 1914 to 74% in 1974.

17.1.2 In 1860, the beginning of the City's renewed growth in recent times, it consisted of some 15,000 people within the Old City Walls, surrounded by scattered Arab villages. New quarters were built outside the Walls, by Jews and by non-Jewish groups and institutions, including Russian, German and American. A second phase was the growth of the Jewish population by immigration, between the end of the century and World War I, reinforcing its stakes as the largest population group of the city over the last century. From the end of Ottoman rule and the new British Mandate in 1917, when Jerusalem became the capital city, the city more than doubled its population.

17.1.3 With the establishment of the State of Israel in 1948 the city was divided, as a result of the War of Independence, into the Israeli and Jordanian sectors of

West and East Jerusalem, each under separate socio-econonic political forces, each cut off from the other and their respective hinterlands and each planned separately. East Jerusalem did not have great significance as an urban center under the Jordanian Government and grew slowly; West Jerusalem received the stimulus of being the capital, although not the major city of Israel. After the Six Day War of 1967 the City was reunified and enlarged and became accessible to a much larger hinterland, both of Israel and of Judea and Samaria, on the West Bank of the Jordan.

17.1.4 The nature of the recent urban growth is seen from a number of indicators of change in the years 1967–1973.

1. The unification and enlargement of the city required a rapid expansion of municipal responsibilities.

2. Within the city, even though West and East Jerusalem are still recognizable, there is a breaking down of the barriers in terms of social, economic and government activities.

3. For the first time since 1948, Jerusalem has a hinterland from which there is access in all directions to the whole city as opposed to limited access to each part.

4. There is a growing transfer of activities from Tel Aviv to Jerusalem, both government and other.

5. The road access to Tel Aviv has been considerably improved, with the travel time down almost to one ofdaily commuting.

6. While the rate of increase of the Jewish population was not significant (2.9% per annum compared with 2.6% in 1961–6) that of the Arabs was more than doubling, from 1.5% to 3.6% per annum. The reasons were the decline in Arab emigration from East Jerusalem, because of the greater job opportunities after 1967.

7. The actual rate of house building has been even faster, reaching 6%–7% in 1971, to allow for the rapid formation of households and the housing shortage.

8. There is growth in economic activity of all kinds, including hundreds of new hotel rooms for tourism, the two campuses of the Hebrew University, Government offices, factories in new industrial estates, commerce, services, cultural centers and other types of construction.

9. New commercial developments under construction show the high rise tendencies found in larger cities, with hotels, residential blocks and offices, aiming at between 10 and 20 stories.

17.2 Planning process

17.2.1 The present plan follows the contemporary British planning system. They include:

a. Structure Plan showing the main framework for the city as a whole.

b. Development strategy showing the path of city-wide development until 1985, incorporating a development programme for the next five years.

c. Local plans for different areas of the city, such as the Old City, Central Area.

d. Subject plans for certain city-wide matters which should be dealt with as a whole, pending the comprehensive plan (e.g. policies for heights of buildings and hotels).

e. Action area plans for those areas where development or renewal is likely on a large scale in say the next ten years (e.g., Mamila, Russian Compound).

17.2.2 The goals of these new plans express the national and international significance of the city and its everyday life, aiming to provide social, cultural and economic integration for the various national groups, good environment, efficient functioning of the urban system, prosperity, full employment and an adequate level of transportation.

17.3 Planning issues

17.3.1 The population growth forecasts for Jerusalem imply a city of around half a million for the middle of the 1980's. The physical extent of the city has already been shaped by the development of outlying residential suburbs and will be further shaped by topographic limitations to growth because the pressure of a large population could damage the highly vulnerable area of the Old City and its immediate surroundings. The character of the city is influenced by its peculiar topography of a plateau (with deep internal valleys) surrounded by steep downward slopes. Physical containment on the plateau by a green belt would restrict the city to 500,000 to 600,000 people. There is a risk that overspill beyond say 1985–90 when the physical envelope is filled up, and even before then from extra-urban pressures, would continue the current trend for scattered ex-urban residential pockets and straggling villages. The alternative solutions under consideration are the continuation of development in linear form along three major valleys leading from the city, dispersal beyond the green belt and the build-up of open land currently visualised as part of the green belt.

17.3.2 A detailed plan prepared for the walled Old City, and its environs provides for 24,000 resident population, in the traditional four quarters (Armenian, Christian, Jewish and Moslem), and for the needs of pilgrims and tourists (up to 100,000

a week). This plan aims to protect the heritage of the built fabric and preserve the character of the natural surroundings of the Old City by the creation of parks around the walls, the restoration of villages near the walls and by the protection of the skyline and slopes framing the city.

17.3.3 The location of Central Area services is a particular problem in Jerusalem. The shopping and business centers of East and West Jerusalem form an area which is poorly laid out, needs large scale renewal, is not well served by roads, and is not a good basis for expansion into the major kind of center needed by a city of half a million with a growing hinterland. Moreover, its growth threatens to damage the Old City. Present policy is to restrict the growth of the existing center and locate the overspill either on the periphery of the established central business district or the Government Office Center, or in dispersed business centers throughout the city.

17.3.4 The preservation of the historical heritage of Jerusalem requires the protection of hundreds of sites of archaeological, religious, historic and architectural interest. A current survey is under way to establish priorities for protection and to find a means of protecting those not in public ownership (see 15.3). There are quarters, built up to a hundred years ago, which are worthy of protection because of their established character, e.g., German Colony, Greek Colony, Ethiopian Quarter, Yemin Moshe, Silwan, Mea Shearim, Nahlaot, which need conservation and rehabilitation to enable them to be usefully occupied.

17.3.5 The choice of areas for new building in Jerusalem is between the hilltops with open valleys, along the valley bottoms leaving the crowns of the hills free, along the slopes with hills and valleys left open, or indiscriminately over the whole area. The present plan proposes to continue the tendency over the last thirty years to build on the ridges and upper slopes which are well-drained in winter and cool and agreeable in summer, leaving the valley bottoms open for parks, woodlands and other open space.

17.3.6 High buildings are a particular problem in Jerusalem as they can infringe on the well-established historical skylines, scale and view, which is accentuated by the hills and valleys. The policy regarding high buildings restricts new development to a range of three to eight storeys in the central business district, to twelve storeys in a limited area away from the Old City, and to a maximum of four in the outer residential areas, except in large areas of comprehensive development.

17.3.7 The city is facing serious problems in transportation. Vehicle ownership is low and likely to expand dramatically (some four-fold by 1985) but the road system, which has been inherited from the past, is poorly suited to modern transportation, both in layout and capacity. Transportation policies aim to restrict private car use by land use limitation and dispersal policies to keep down traffic generation and attraction and by improving the present existing bus system. There is now a search for policies which would further reduce the likely impact of the motor car, in terms of land take, visual impact, noise, atmospheric pollution, severance of communities, etc. They include proposals to deflect unnecessary cross-town

and cross-center movement of private vehicles away from the central business core and inner quarters and to restrain home-to-work journeys by car.

17.4 Urban plans

Particular attention has been paid in this chapter to the preparation of plans for the future development of Jerusalem, but most towns in Israel have approved development plans. Some are still little more than maps of land use allocation, though there is a general move towards the more flexible system of structure plans, showing and explaining the direction of development without defining detailed land use allocation.

SOURCE MATERIAL

A. Material prepared for the Habitat Conference, 1976

BERLER, A., University of Haifa	Some thoughts about social problems in development towns in Israel.
LEVI, Y., University of Haifa	A definition of the rural cooperative community in developing countries.
Ministry of Housing	Report on Housing in Israel.
Ministry of the Interior	Settlement Sites in Israel.
ORNI, E., Jewish National Fund	Land Reclamation and Forestry in Israel.
ORNI, E., Jewish National Fund	The Agrarian System in Israel.
ROKACH, A., Jewish Agency	Rural Settlement in Israel.
ROKACH, A., Jewish Agency	Regional Rural Settlement: A Case Study of the Lachish Region.
SHECHTER, J., Ben Gurion University of the Negev	Settlement in Israel's Desert Areas

B. Publications on settlement policy in Israel

Brutzkus, E., Physical Planning in Israel, Ministry of the Interior, 1964

Built Environment, Special issue on Israel, Vol. 3, 1974

Environmental Quality in Israel, 1973 – 1974, Annual Report, No. 1 – 2, Environmental Protection Service, 1976 (in press)

Haber, A., Population and Building in Israel 1948–1973 – Ministry of Housing, 1975

Lichfield, N., Israel's New Towns: A Development Strategy, Ministry of Housing, 1971

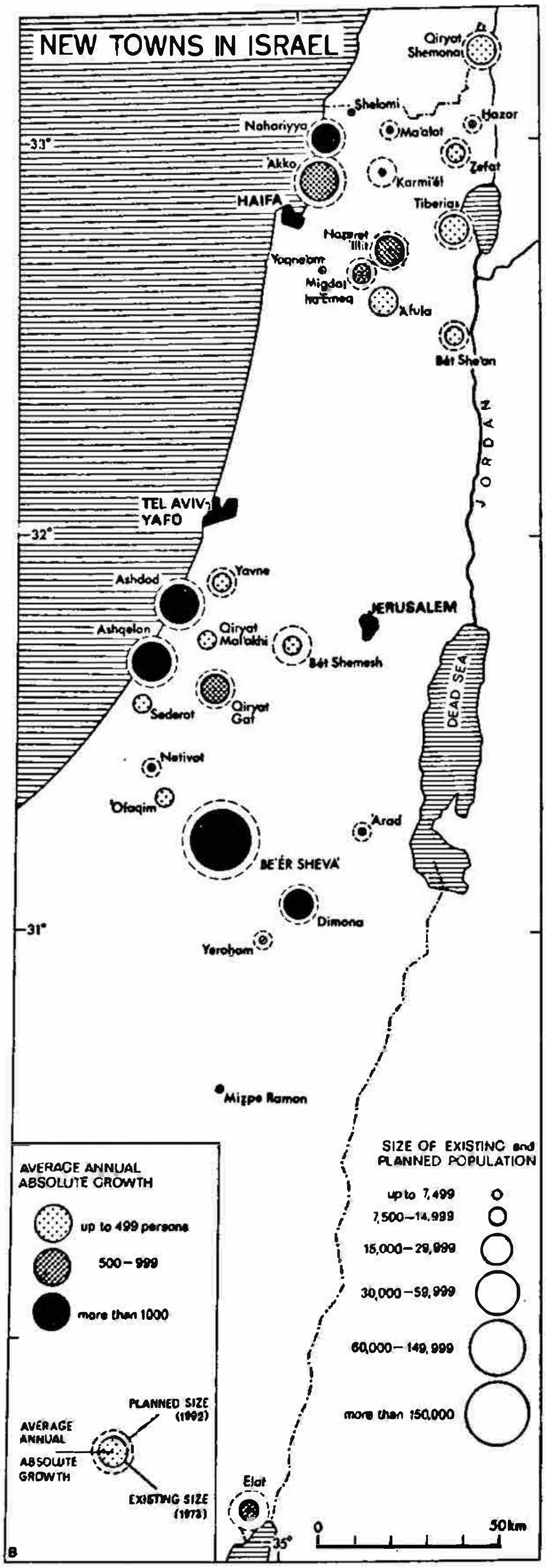
Lichfield, N., Jerusalem Planning 1973, Third World Congress of Engineers and Architects in Israel, 1973

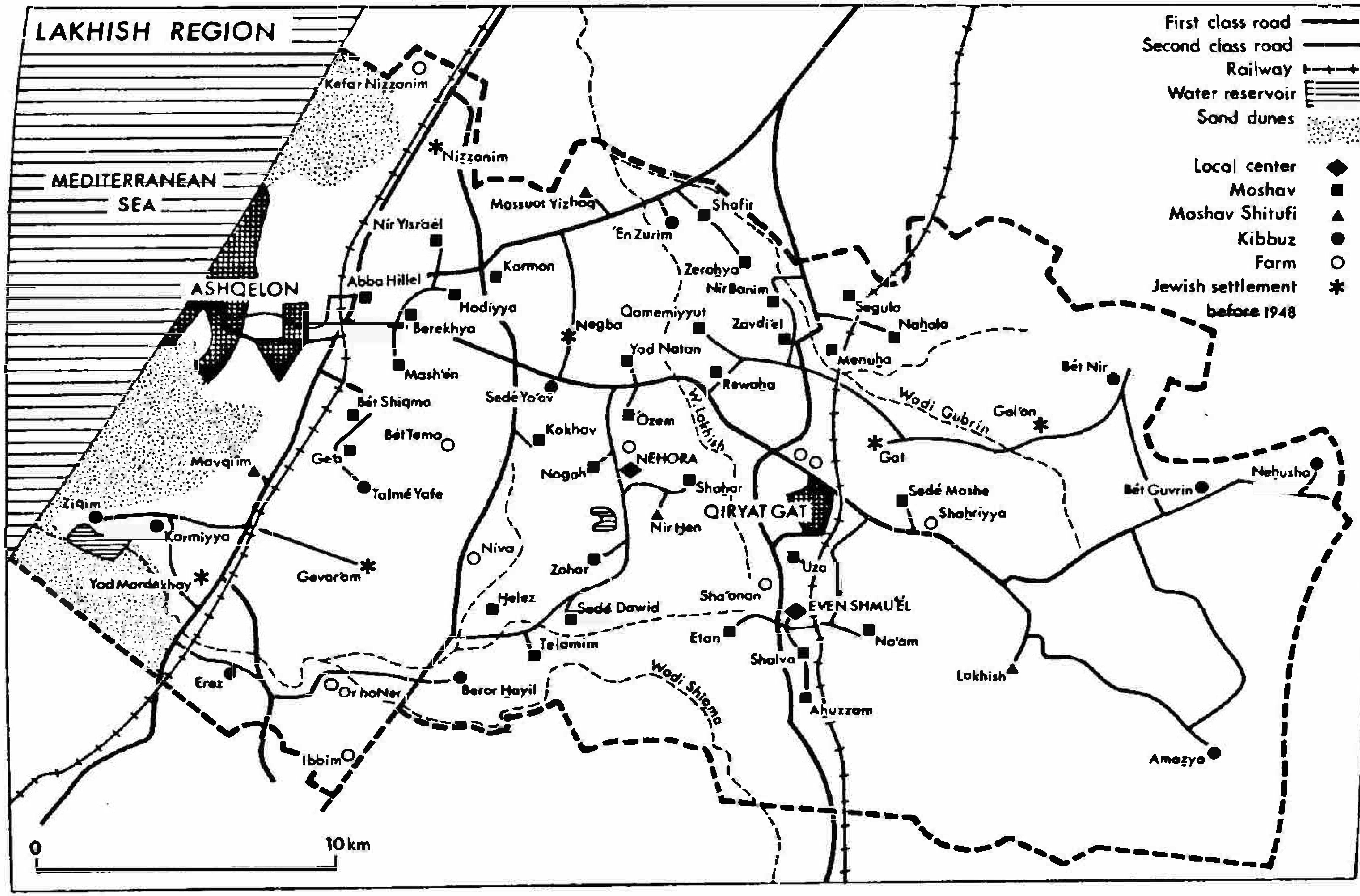
Population Distribution for a total of 5 million, Ministry of the Interior, 1972 (in Hebrew)

Shahar, A., Israel's development towns – evaluation of national urbanization policy, Journal of the American Institute of Planners, Vol. 37, 1971

Shapiro, S., Planning Jerusalem: the first generation 1917–1968, in: Urban Geography of Jerusalem, a Companion Volume to the Atlas of Jerusalem. Masada Press, 1973

Map 1


NEW TOWNS IN ISRAEL
Qiryat Shemona
Shelomi
Hazor
Nahariyya
Ma'alot
33°
'Akko
Zefat
Karmi'él
HAIFA
Tiberias
Yoqne'am
Migdal ha'Emeq
'Afula
Bét She'an
JORDAN
TEL AVIV-YAFO
32°
Yavne
Ashdod
JERUSALEM
Ashqelon
Qiryat Mal'akhi
Bét Shemesh
DEAD SEA
Sederot
Qiryat Gat
Netivot
'Ofaqim
'Arad
BE'ÉR SHEVA'
Dimona
31°
Yeroḥam
Mizpe Ramon
AVERAGE ANNUAL ABSOLUTE GROWTH
up to 499 persons
500 – 999
more than 1000
SIZE OF EXISTING and PLANNED POPULATION
up to 7,499
7,500–14,999
15,000–29,999
30,000–59,999
60,000–149,999
more than 150,000
PLANNED SIZE (1992)
AVERAGE ANNUAL ABSOLUTE GROWTH
EXISTING SIZE (1973)
Eilat
35°
0
50 km
B


LAKHISH REGION
First class road
Second class road
Railway
Water reservoir
Sand dunes
Local center
Moshav
Moshav Shitufi
Kibbuz
Farm
Jewish settlement before 1948
MEDITERRANEAN SEA
ASHQELON
Kefar Nizzanim
Nizzanim
Massuot Yizhaq
Shafir
'En Zurim
Nir Yisra'el
Karmon
Zerahya
Nir Banim
Abba Hillel
Hodiyya
Berekhya
Negba
Qomemiyyut
Zavdi'el
Segula
Nahala
Yad Natan
Menuha
Mash'en
Rewaha
Bét Nir
Bét Shiqma
Sedé Yo'av
W. Lakhish
Wadi Gubrin
Gal'on
Bét Tema
Kokhav
Ozem
Geta
Nogah
NEHORA
Gat
Mavqi'im
Talmé Yafe
Shahar
Sedé Moshe
Nehusha
Bét Guvrin
QIRYAT GAT
Shahriyya
Ziqim
Nir Hen
Karmiyya
Niva
Gevar'am
Zohar
Uza
Yad Mordekhay
Sha'anan
Helez
Sedé Dawid
EVEN SHMU'EL
Etan
No'am
Telamim
Shalva
Wadi Shiqma
Lakhish
Erez
Beror Hayil
Or haNer
Ahuzzam
Ibbim
Amazya
0
10km

Map 2

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