MEDITERRANEAN ACTION PLAN
BLUE PLAN REGIONAL ACTIVITY CENTRE

UNEP

UNITED NATIONS ENVIRONMENT PROGRAMME

ISKENDERUN BAY PROJECT
Volume II
Systemic and Prospective Analysis

PROJET DE LA BAIE D'ISKENDERUN
Volume II
Analyse systémique et prospective

MAP Technical Reports Series No. 90

PNUE
Blue Plan Regional Activity Centre
Sophia Antipolis, 1994

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This volume is the ninetyeth issue of the Mediterranean Action Plan Technical Report Series.

This series will collect and disseminate selected scientific reports obtained through the implementation of the various MAP components: Pollution Monitoring and Research Programme (MED POL), Blue Plan, Priority Actions Programme, Specially Protected Areas, Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea, Environment Remote Sensing and Protection of Historic Sites.

Ce volume constitue le quatre-vingt dixième numéro de la série des Rapports techniques du Plan d'action pour la Méditerranée.

Cette série permettra de rassembler et de diffuser certains des rapports scientifiques établis dans le cadre de la mise en oeuvre des diverses composantes du PAM: Programme de surveillance continue et de recherche en matière de pollution (MED POL), Plan Bleu, Programme d'actions prioritaires, Aires spécialement protégées, Centre régional méditerranéen pour l'intervention d'urgence contre la pollution marine accidentelle, Centre méditerranéen de télédétection et Protection des sites historiques.

REMARK

The two volumes of the "Iskenderun Bay Project" result from a study initiated by the Turkish Ministry of the Environment, and undertaken by a team of experts from the Faculty of Political Sciences of the University of Ankara, in close co-operation with the Blue Plan.

Volume I is the report of the Turkish Team (original: Turkish), while Volume II (original: French) is the specific contribution of the Blue Plan to the achievement of the project. All cartographic documents have been prepared by the Blue Plan.

BLUE PLAN REGIONAL ACTIVITY CENTRE FOR THE MEDITERRANEAN

ISKENDERUN BAY PROJECT

Volume II

Systemic and Prospective Analysis

September 1993

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FOREWORD

The Iskenderun Project constitutes the first local implementation of the Blue Plan's prospective methodology, and is the result of a request for co-operation with BP/RAC on the part of the Turkish Ministry for the Environment.

Close collaboration was set up between the work teams in a mutually stimulating and trust-oriented frame of mind. Although systemic and prospective methodology for coastal zones requires further research and practical experience, results are nonetheless quite encouraging and the objective of aid to decision-makers has been reached.

The BP/RAC would like to thank everyone for their contribution to this study and particularly Mrs. Z. Arat and Mrs. N. Algan, from the Turkish Ministry of the Environment who supported the project from the beginning, as well as Professors C. Hamamci and C. Aruoba, of the Faculty of Political Science of the University of Ankara with whom the Blue Plan team maintained permanent contact.

Local representatives demonstrated interest and extended such a warm welcome that the Project ran very smoothly. We would like to thank in this regard the Municipality of Iskenderun, The Association for the Defense of the Environment of Iskenderun Bay, the Chambers of Commerce and Industry, as well as the other Municipalities of the Bay and the industrialists of ISDEMIR and BOTAS.

EXECUTIVE SUMMARY

The study on the "Iskenderun Project'" was carried out over a three-year period from January 1990 to December 1992. Sponsored by the Turkish Ministry of Environment, the study was carried out by a team from the Ankara University of Political Sciences, assisted by the Blue Plan. The object of this study was to propose an environment management model for the Iskenderun Bay, within Development/Environment problematic based on systemic and prospective analysis. The specific task of the Blue Plan consisted in giving methodological assistance to the Turkish team. This assistance materialised in the course of joint meetings with the Turkish and Blue Plan teams in Ankara and at Sophia Antipolis, as well as in the course of Blue Plan missions in Ankara and Iskenderun, through synthetic reports, methodological notes and sets of maps and diagrams illustrating the approach, the issues and the results. The study involved three stages, the first being dedicated to system knowledge, the second to the Iskenderun Bay prospective and the third to the presentation and discussion of results.

The initial stage of analysis and system knowledge acquisition highlighted constraints, heavy trend and processes, and several tools were tested or suggested : primary mapping, structural matrix, social accountancy matrix, analysis of the actors' role. Primary mapping is a schematic representation of the system's elements and their interrelationships, it is an initial model of the study zone used to classify incomplete data. Applied to Iskenderun Bay, mapping highlights the actors involved, the imbrication between the activities on the coastal zone, the importance of the urban phenomenon, the hypertrophy of the "Transportation" function.

Through structural analysis, the existing relationships between the system components can be described and analysed, by using a double entry matrix. In the case of Iskenderun Bay, the difficulties inherent to the implementation of the exercise (which presupposes that a multidisciplinary team be mobilised over a long period) have lead us to drawing up the list of variables. There are 66 variables, which describe Iskenderun Bay within eleven sub-systems: nature, population and society, economy and society, agriculture, industry (including craftsmanship, and the agri-food sector) energy, tourism, transportation, construction and public works, pollution and waste, and political and administrative systems.

A social accountancy matrix was designed to identify the most important ties between the region of Iskenderun and the other regions of Turkey or the outside world. This matrix considers the production activities, payment factors, transfers to the main economic agents and the consumption of these same agents. It is in fact the matrix presentation of the United Nations system of national accountancies. One of its original characteristics is to bring into focus the social factors through specific classifications for the first four categories. Households are thereby classified according to their income, to highlight the poorest levels. Two (or more) corporation categories can also be differentiated in each sector of production, to put emphasis on small-size enterprises, or better yet, those where

productivity is lower than in more modern activities. Another originality could be the introduction of sub-matrices in physical terms (tons of pollutants) or in population classes (active population) in the system, in the form of derived matrices.

For successful analysis of the actor's roles, an "Actors' Strategy" chart can be drawn up, in which the diagonal line boxes constitute the "identification sheet" of the actor seen from three viewpoints (Goal, Issues, Means) and where the other boxes contain information on how one actor can play on each of the others to attain his objective. Alliances, conflicts or neutral attitudes can thus be revealed.

Another analysis mode for the actors' role, "Heritage Audit", rests on actively involving those actors who are considered as experts in their fields. This method consists in obtaining the opinions of a pre-selected group of people, during semi-directive conversations and according to a pre-determined grid. Within the framework of the Iskenderun Bay Project, this result in 43 conversations within the study zone and in 7 conversations in Ankara, leading to better understanding of the actors' motivations, differences and converging interests

The second stage was dedicated to the prospective per se of Iskenderun Bay. The Blue Plan contributed to setting up the hypotheses for both scenarios (trend and alternative) by the year 2025. The hypotheses involve the same criteria as those used by the Blue Plan in its global Mediterranean scenarios (i.e., the international context, population, national development strategy, spatial management and consideration of the environment).

During this specific stage, we illustrated the results, by using maps and diagrams, (on population, urbanisation and industrialisation, transportation, bay pollution), based on spatial management and environmental consideration hypotheses. Data on the international context and on national development policies remained the constant underlying factors during the study and we have of course ensured global coherence.

The trend scenario for Iskenderun Bay by 2025 is characterised by moderate economic growth and the search for short-term profit within a fiercely competitive environment, inefficient social policies, laxist and conflictual spatial management strategies and, finally, environmental consideration of the curative type, in emergency-triggered and individual cases. The resulting prospective image of Iskenderun Bay demonstrates two speeds of social development, and highly contrasted spatial land use. There are economically deprived zones and rural exodus conditions along with industrialised areas, strong urbanisation growth and communication means. Pollution and hazards degrade -and sometimes destroy- natural media, such as the coastal ecosystem and lead to many conflicts within the involved activities in terms of natural resource exploitation.

The alternative scenario is characterised by strong economic growth within regional co-operation context, slower urbanisation evenly balanced between major and medium-size cities, diversified industrial productions and tourism activities. This scenario requires voluntarist policies, regarding spatial management and environmental consideration, to establish the conditions for sustainable development. In this context, the image of Iskenderun Bay is that of a global region structured around an industrial and urban axis, under controlled management, surrounded by two areas of balanced development based on the rational use of natural resources (agriculture, fishing, aqua culture) and on tertiary activities compatible with the protection of certain remarkable ecological areas.

During the third phase of presentation and discussion of results, the Blue Plan participated in the public presentation of the final report by the Turkish team from the University of Political Sciences of Ankara, illustrating the overall approach and the essential results, through the use of maps and diagrams. This presentation was made to a large audience of local authorities (municipalities, chambers of professional groups, Associations for the protection of the Bay environment, industrialists) and officials from various ministries and state bodies. The discussion gave rise to fruitful exchanges concerning the proposed model of environment management and the conditions for its implementation.

In conclusion, systemic and prospective analysis of Iskenderun Bay has resulted in the following:

- it has highlighted the risks of long-term degradation or destruction of natural resources and media;
- it has identified present and future conflicts between activities and resources;
- it has underlined the multiple interdependencies between development and environment on various scales;
- it has initiated collective reflexion processes on the future of the Bay, demonstrating the mobilising power of the prospective approach.

1. INTRODUCTION

The "Iskenderun Project" was implemented over a three-year period, from January 1990 to December 1992.

Requested by the Turkish Ministry of the Environment, the study was carried out by a team from the Faculty of Political Science of Ankara, assisted by the Blue Plan. The objective was to propose a management model for the Iskenderun Bay environment, in the framework Development/Environment on the basis of systemic and prospective analysis.

This report will describe more specifically the contributions of the Blue Plan team and experts. The specific task of the Blue Plan was to assist the Turkish team with methodology. This was materialised by joint meetings with the Turkish/Blue Plan teams in Sophia Antipolis, by missions of the Blue Plan sent to Ankara and Iskenderun, by systematic reporting, methodology memos, and by maps and diagrams illustrating the approach, issues and results. We must emphasise the excellent spirit of collaboration and trust which prevailed between the team members, leading to mutually profitable exchanges enhancing the relevance of the Blue Plan's contribution.

The study included three stages. The first dealt specifically with the analysis and knowledge of the system to evidence constraints, major trends and processes. Several tools were tested or proposed, such as primary mapping, structural matrix, social accounting matrix, and the analysis of the actors' roles.

The second stage lead to the prospective of Iskenderun Bay itself. The Blue Plan contributed to the selection of scenario hypotheses, and participated in the ensuing discussions at several meetings involving many local actors and central administration representatives.

During the third phase of presentation and discussion of results, the Blue Plan drew up maps and diagrams to illustrate the final images of the scenarios and participated in the public presentation of the final report drafted by the Faculty team.

During the study, the Blue Plan's role was to assist the Turkish team in its reflexion and to make recommendations on systemic and prospective tools best-adapted to the Project. The Blue Plan also strove to be a catalyst and a place for open discussions, to verify the specificities of the approach and to ensure result coherence. Finally, the Blue Plan made prospective maps and diagrams, as well as documents on environment management experiments, available to its Turkish partners to be used as educational material for the Project.

The overall study involves the work undertaken by the Turkish team on the one hand, and the specific contribution of the Blue Plan on the other, described in this report (see Appendix 2 "List of Documents related to the Iskenderun Project").

2. STUDY ZONE PROBLEMATIC AND LIMITS

The Project was a result of the observations of pollution in the Iskenderun Bay, the existence of heavy industrial implantation projects, the action of Associations for the Protection of the Environment and the will of the Turkish Ministry for the Environment to enhance management of the area by preserving the natural environment and its potential for economic growth.

The Project is therefore involved in Development/Environment problematic, with the objective of establishing sustainable social and economic development, while ensuring optimized management of natural resources.

Systemic and prospective analysis of Development/Environment has always been the central core of Blue Plan Mediterranean Basin scenarios. It allows global approach to issues, understanding of the dynamic relationships between varied activities and natural environment, identification of long-term freezes and ruptures, identification of the actors and their logic, and finally the exploration of possible futures to offer alternatives to decision-makers. The Project covers a restricted coastal zone, and the analysis must include several levels of action and interaction, on different space and time scales. Within this context, the Blue Plan suggested the use and adaptation of relevant tools[1]. The systemic and prospective approach selected for the Iskenderun Project was the Blue Plan's first implementation over a small coastal zone.

The study involves three stages, including :

1) the analysis and knowledge of the system
2) the prospective itself
3) result presentation and discussion before the end of the Project.

Iskenderun Bay (Figures 1 and 2) is located in the far North-east of the Mediterranean. Strictly speaking, it covers the marine waters between Cape Akinci and Fener Point. The Bay is almost rectangular in shape (60 km long and 35 km wide, i.e. approximately 2 100 km^2)[2], with an average depth of approximately 70 m (i.e. approximately 147 km^3).

The land part of the study zone covers the coastal districts of the Provinces of Adana and Hatay, and extends from the mouth of the Seyhan River to the Syrian border. The seven coastal districts cover an overall surface of 3 755 km^2, and represent 16 % of the territory of these provinces. It must however be emphasised that the coastal districts cover 41 % of the territory in the province of Hatay, versus only 8 % in the Province of Adana.

The coastline of the study zone represents approximately 280 km.

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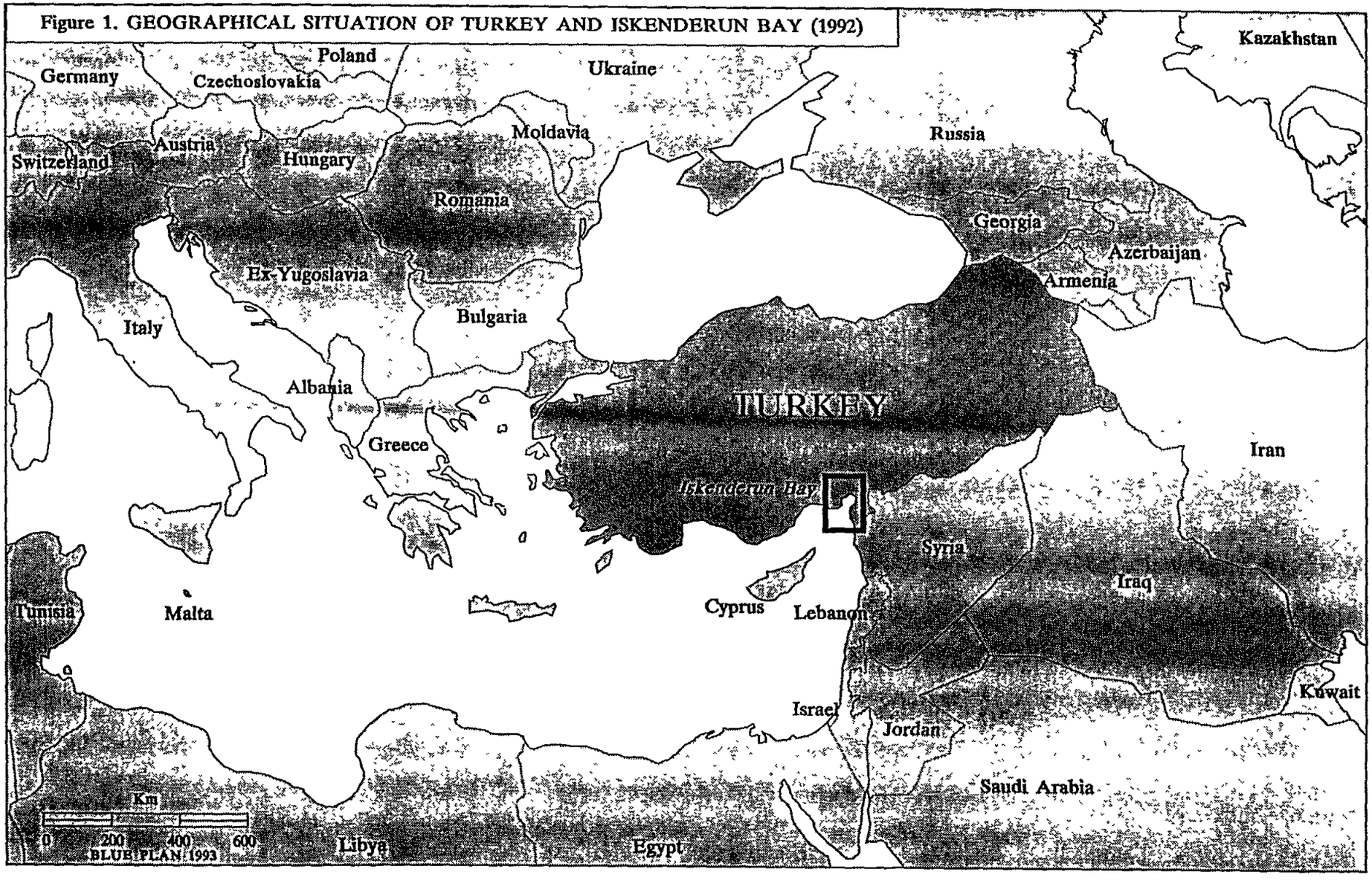
[1] M. Grenon, Approche Méthodologique pour des "scénarios littoraux", Plan Bleu, March 1991.

[2] Assessed on the basis of the S.H.O.M. INT 3602-7080 map, De Anamur Burnu à Banias, Service Hydrographique et Océanographique de la Marine, France, 1986

Figure 1. GEOGRAPHICAL SITUATION OF TURKEY AND ISKENDERUN BAY (1992)



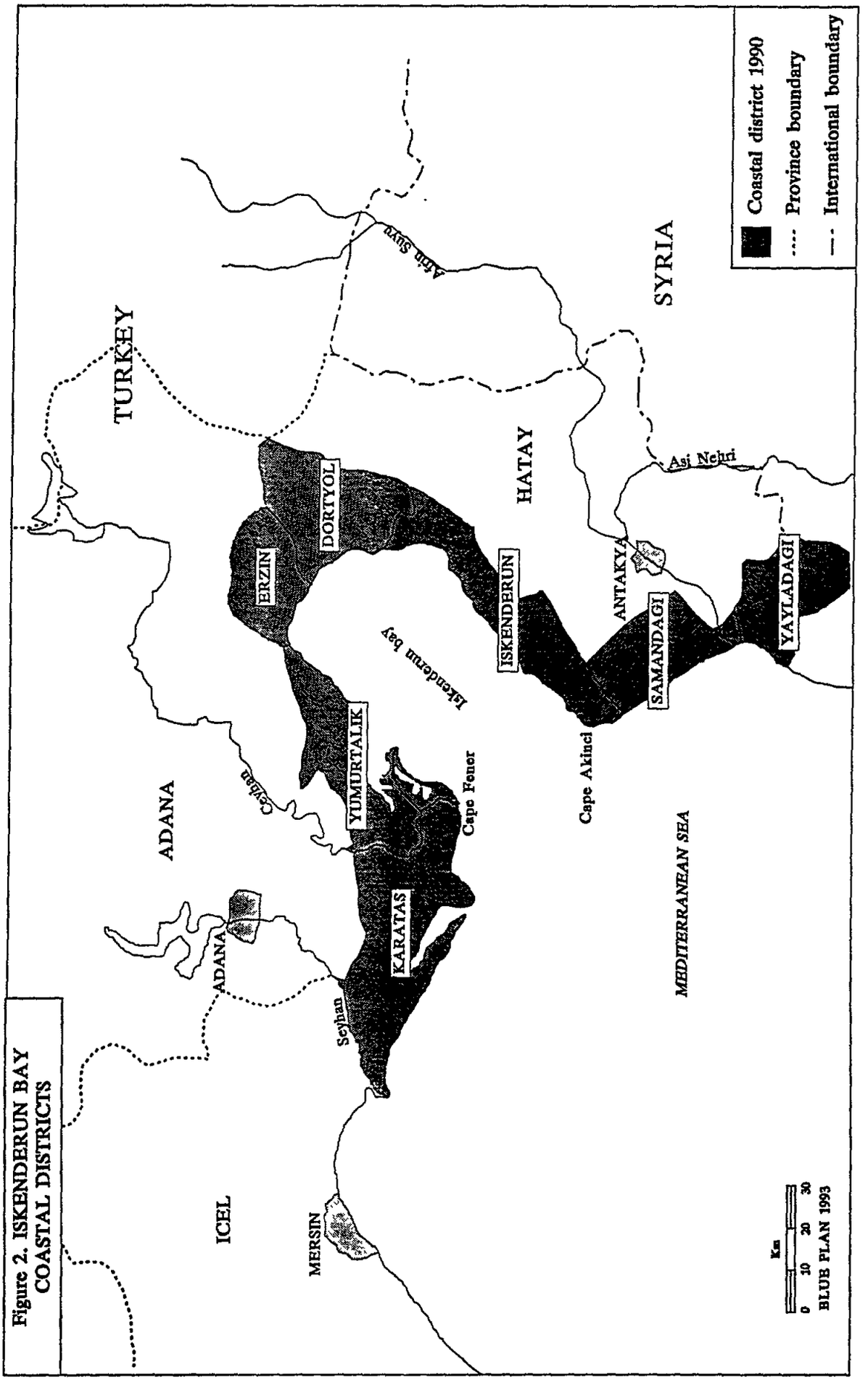


Figure 2. ISKENDERUN BAY
COASTAL DISTRICTS
TURKEY
SYRIA
HATAY
ADANA
ICEL
MERSIN
ADANA
KARATAS
YUMURTALIK
ERZIN
DORTYOL
ISKENDERUN
SAMANDAGI
YAYLADAGI
ANTAKYA
Iskenderun bay
Cape Fener
Cape Akincl
MEDITERRANEAN SEA
Ceyhan
Seyhan
Afrin Suyu
Asi Nehri
Coastal district 1990
Province boundary
International boundary
Km
0 10 20 30
BLUE PLAN 1993

Three rivers flow into the sea : the Seyhan, Ceyhan and Asi. Their watersheds cover 50 228 km^2 (by only taking into account the Turkish waters of the Asi river).

The two coastal districts of Adana Province belong to the vast Cukurova plain where intensive agricultural activity has lead to the development of powerful agro-industry. Backed by the Amanos Mountain Range, the coastal districts of the Hatay Province are at the crossroads of the commercial routes Mediterranean/Eastern and South-eastern Anatolya, where the huge G.A.P.[3] Project (hydro-electricity and irrigation for 1.6 million hectares) is currently underway.

[3] Republic of Turkey , Prime Ministry, State Planning Organisation -"South-eastern Anatolia Project, Master Plan Study, Final Master Plan Report, Executive Summary", by the joint venture Nippon Koei Co Ltd., Tokyo & Yuksel Proje A.S, Ankara June 1990.

3. ANALYSIS AND KNOWLEDGE OF THE SYSTEM

3.1. Primary Mapping

Systemic analysis tends toward greater understanding of the existing relationships between the elements of a system. One of the techniques used is what we call "primary mapping"[4]. This consists in schematically representing the elements and their relationships in order to highlight trails for reflexion, by revealing inherent factors and initial identification of actors. It is in fact a list of selected elements, classified and linked together. Moreover, mapping sets the system under study in a wider context, and reveals the main relationships between the system and the exterior.

In the case of the Iskenderun Project, and after several visits and meetings, the Blue Plan team used this method to reveal project-specific issues, which would otherwise have been difficult to highlight in view of the quantity of heterogeneous information available.

The approach is illustrated in Figures 3, 4, 5 and 6, which are incomplete (in view of the definition of the notion of system), for several reasons.

The first reason is conceptual: how can complex, interdependent systems be represented without data loss ?

The second reason is of a practical nature : how can such a system be graphically represented, and remain readable ? Graphic results would have been improved by the use of more sophisticated software.

The third reason involves the study objectives, i.e. to obtain better knowledge of the system. Once this goal was reached, no further time was spent on details.

Figure 3 represents the elements of the Iskenderun Bay system, built by the Blue Plan, and their interrelations as well as the influence/dependency relationships between the Bay and the neighbouring or surrounding systems.

The following elements were retained for the "Iskenderun" system :

- five sectors of activity (agriculture, industry, energy, tourism, transportation);
- population and population distribution (urbanisation);
- the environment from the angle of pollution and spatial land use (free and industrial zones, coastal concentration of activities and population).

Regarding external liaisons, the following choice was made :

- regional systems "Cukurova" and "GAP", sources and destinations of many strong and direct flows;
- the "Turkey" system to integrate State centralisation and the importance of internal migrations within the national territory;
- the "Near East" and "Middle East", "EEC" and "Rest of the World" systems as the factors explaining the current and future situation, at all three social, economic and geopolitical levels.

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[4] P. Gonod, Dynamique de la Prospective, CPE/ADITECH Etude No 136, 1990

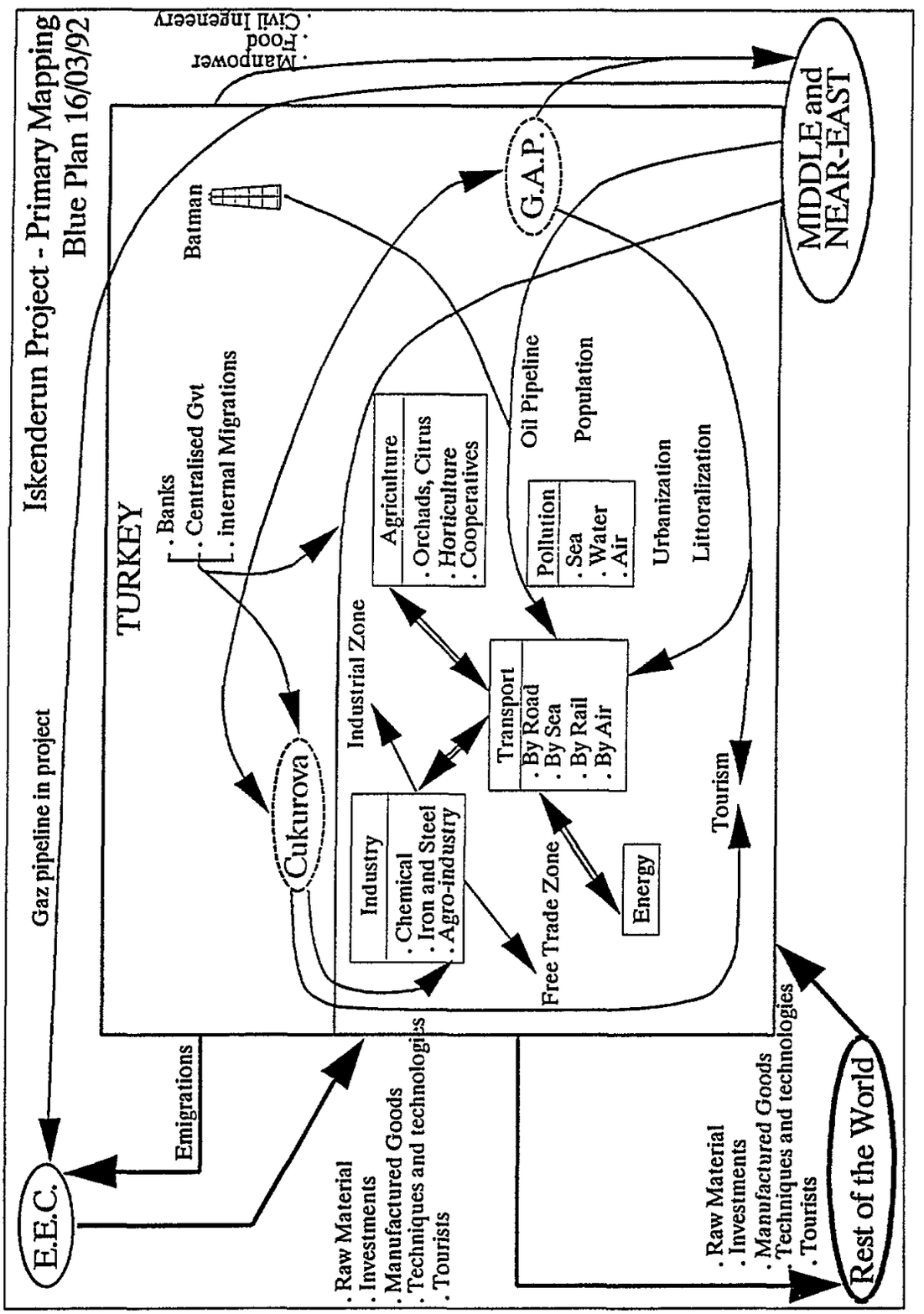
Iskenderun Project - Primary Mapping
Blue Plan 16/03/92
E.E.C.
Gaz pipeline in project
Emigrations
. Raw Material
. Investments
. Manufactured Goods
. Techniques and technologies
. Tourists
TURKEY
. Banks
. Centralised Gvt
. internal Migrations
Batman
. Manpower
. Food
. Civil Ingeneery
Cukurova
Industrial Zone
Industry
. Chemical
. Iron and Steel
. Agro-industry
Agriculture
. Orchads, Citrus
. Horticulture
. Cooperatives
Transport
. By Road
. By Sea
. By Rail
. By Air
Free Trade Zone
Energy
Pollution
. Sea
. Water
. Air
Oil Pipeline
Population
Urbanization
Littoralization
Tourism
G.A.P.
MIDDLE and NEAR-EAST
. Raw Material
. Investments
. Manufactured Goods
. Techniques and technologies
. Tourists
Rest of the World

Figure 3.

Figure 4.

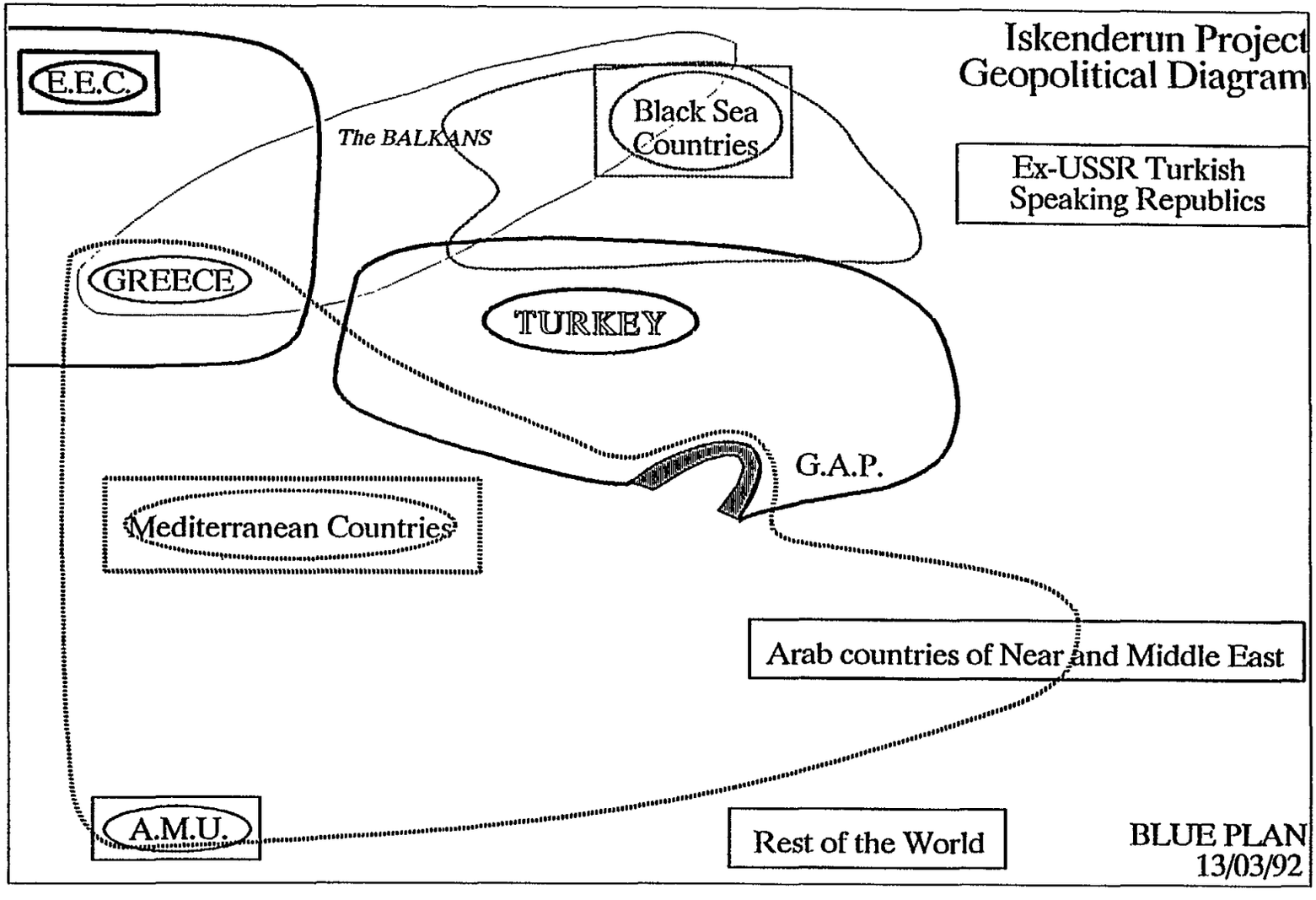
Iskenderun Project
Geopolitical Diagram
E.E.C.
The BALKANS
Black Sea Countries
Ex-USSR Turkish Speaking Republics
GREECE
TURKEY
G.A.P.
Mediterranean Countries
Arab countries of Near and Middle East
A.M.U.
Rest of the World
BLUE PLAN
13/03/92

Figure 4. bis

Keys for the Geopolitical Diagram

Schematization of Iskenderun Bay

Sovereign countries individualized, Ex : Turkey, Greece

Grouping of sovereign countries within a community, created by treaty with an economic aim, Ex : EEC, AMU (UMA)
The thickness of the line is proportional to the community's reality (oldess, ...)

The "Black Sea Countries" symbol is dotted int the diagram, not signed yet when elaborating it

The "Mediterranean Countries" : Barcelona Convention ratified by the bordering countries for the protection of the Mediterranean

Unstructured group of countries, having or likely to have a considerable importance for Turkey and Iskenderun Bay

The BALKANS

Vague but indisputable entity, which evolution matters to Turkey (in terms of population, culture, economy, etc.)

G.A.P.

Region of Turkey which evolution is important for regional geoplitics (water sharing out, regional economic development)

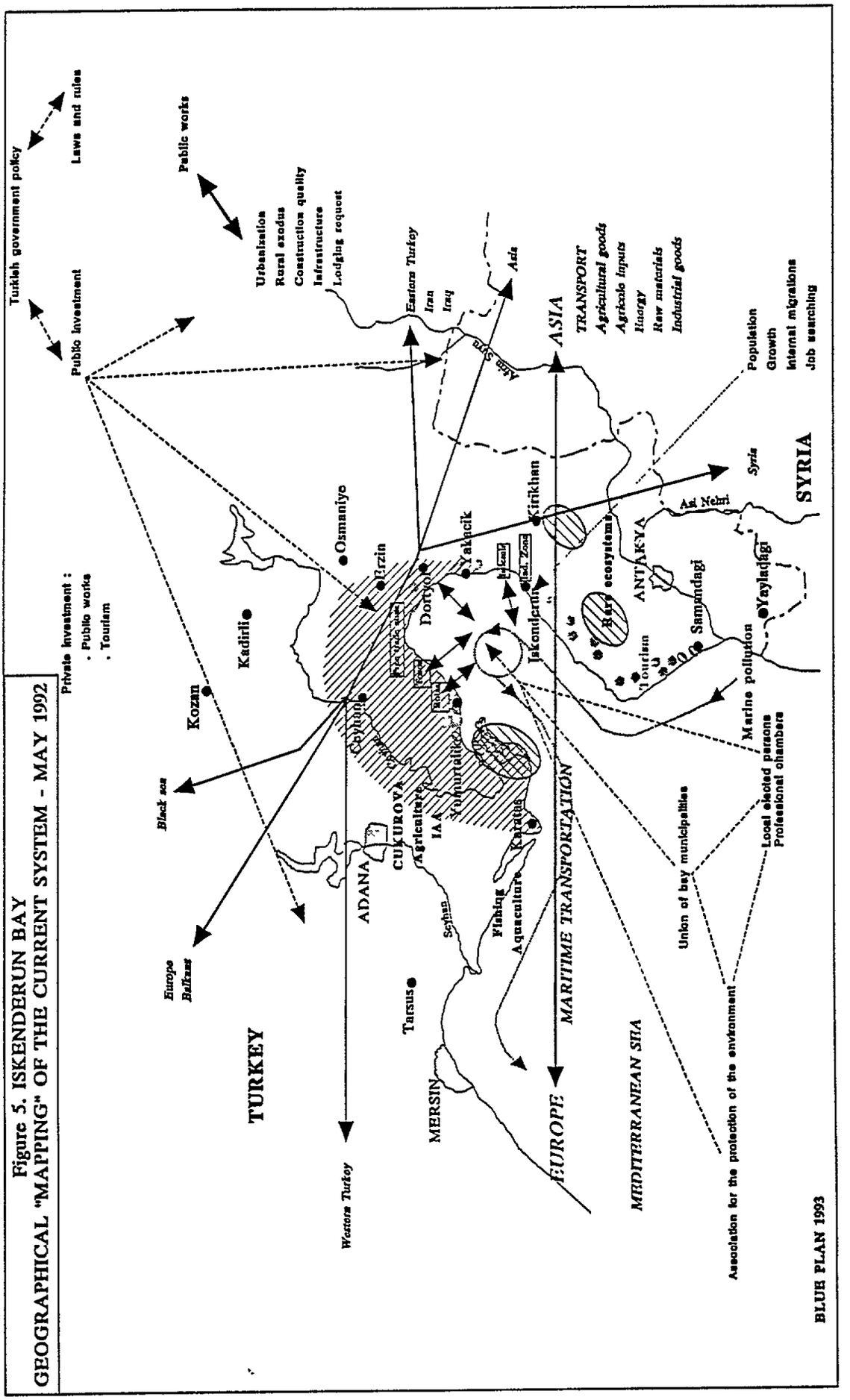
Figure 5. ISKENDERUN BAY
GEOGRAPHICAL "MAPPING" OF THE CURRENT SYSTEM - MAY 1992
Turkish government policy
Laws and rules
Public investment
Public works
Urbanisation
Rural exodus
Construction quality
Infrastructure
Lodging sequent
Private investment :
. Public works
. Tourism
Eastern Turkey
Iran
Iraq
Asia
ASIA
TRANSPORT
Agricultural goods
Agricole inputs
Energy
Raw materials
Industrial goods
Population
Growth
Internal migrations
Job searching
Syria
SYRIA
Osmaniye
Kirikhan
Asi Nehri
Kadirli
Kozan
Dortyol
Yakacik
Iskenderun
Yayladagi
Samandagi
ANTAKYA
Black sea
Europe
Balkans
Western Turkey
TURKEY
ADANA
CUKUROVA
Agriculture
Tarsus
MERSIN
Fishing
Aquaculture
Marine pollution
Union of bay municipalities
Local elected persons
Professional chambers
Association for the protection of the environment
MARITIME TRANSPORTATION
EUROPE
MEDITERRANEAN SEA
BLUE PLAN 1993

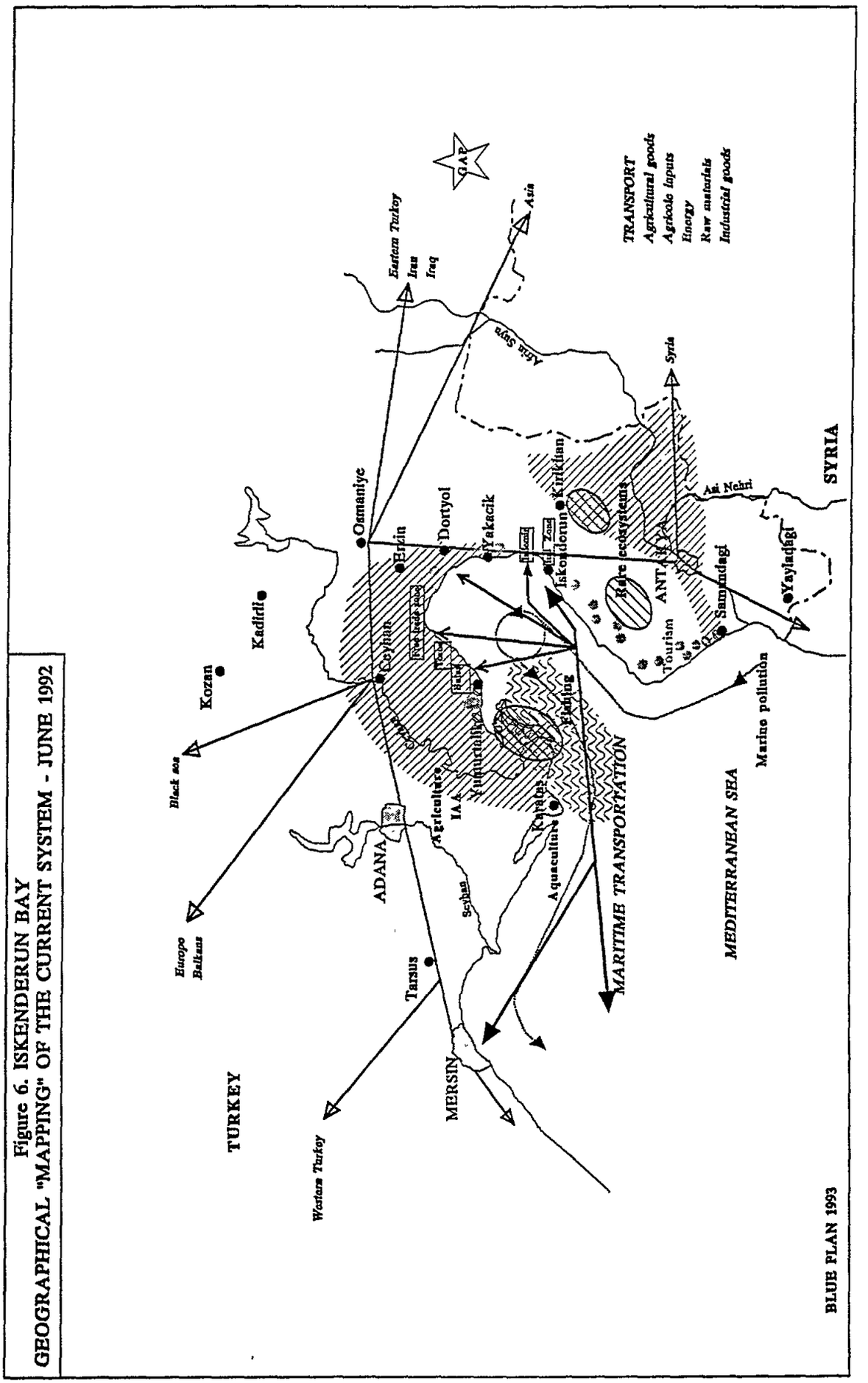

Figure 6. ISKENDERUN BAY
GEOGRAPHICAL "MAPPING" OF THE CURRENT SYSTEM - JUNE 1992

This last aspect has lead to the elaboration of a geopolitical diagram focusing on Turkey (Figure 4), showing the multiple entities interacting with the country and which have or could have an impact upon the future of Iskenderun Bay.

These two representations did not reproduce the reality of physical space. Figure 5 shows the system's elements in their geographical reality[5] for the coasts, the rivers, the cities and the border between Turkey and Syria. Through colours and symbols, the main activities and the actors involved are represented, as well as the interactions, and respective impact on the environment. This is the most complete representation in terms of systemic analysis. However, we stress that the graphical limits of the arrows, of varied types and meanings, were quickly spotted.

This schematic representation of the current Iskenderun Bay system reveals:

- the actors
- the interweaving of activities (agriculture, industry, tourism) on the coastal zone
- urbanisation on the coast itself and on the outskirts of the zone under study
- the importance of "Transportation" function reinforced by trans-shipment between land and sea carriers (ports, loading/unloading points, national and international transit).

This last point is illustrated in Figure 6, a simplified version of the preceding one, which emphasises the hypertrophy of the "Transport" function in the Iskenderun Bay system.

3.2. Selection of the variables

The analysis of the characteristic variables of the system is used to know the structure, of the system i.e. the relationships between the system elements. One of the techniques available consists in using a structural analysis matrix to relate each variable with the whole. This tool identifies the weight of each element and its nature (dependence, motricity), and thereby highlights major trends and the key-factors upon which to act so that the system may evolve. With such a tool, the choice of variables determines in part the accuracy of the results and is therefore an essential part of the work.

Several attempts are usually necessary before making the final choice, so as to reduce the number of variables in order for the matrix to be humanly feasible. For example, a matrix with 50 variables implies 2 450 answers to the question "is this variable related to that one?". With an average answering time of three minutes, this would entail five full 24-hour days. Furthermore, this approach must be entrusted to a multidisciplinary group to ensure the richest possible vision of the system under analysis.

The Blue Plan hoped to carry out the structural analysis matrix exercise over the Iskenderun Bay system. Implementation difficulties (to mobilise for a long period of time a national and international pluridisciplinary team) led to a simplified method.

An initial list of 94 variables was drawn up according to 12 modules or sub-systems and according to their internal or external characteristics (Table 1). The internal variables characterise the module or sub-system; the external ones form its external environment.

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[5] The ATLAS*SIG software from Strategic Mapping Inc. was used to make this diagram and the maps in the report

Table 1. **BLUE PLAN - ISKENDERUN PROJECT: FIRST LIST OF VARIABLES**

	INTERNAL VARIABLES		EXTERNAL VARIABLES
	"NATURE		"NATURE
1	Water resources	62	Climatic changes
2	Soils	63	National policy for agricultural soil protection
3	Land/sea interface, shore, sea side	64	National policy for coastal protection
4	Wetland	65	Seismic risks
5	Rare and/or endangered species (Caretta caretta)	66	International protection conventions
6	Landscapes, sea and mountain, slopes		
	" POPULATION AND SOCIETY"		" POPULATION AND SOCIETY"
7	Permanent population (number)	67	Internal migrations : rural exodus (national potential in 20 years)
8	Population growth		
9	Active population (number)	68	Education policy of the Turkish State
10	Active population growth	69	Health policy of the Turkish State
11	Housing		
12	Rate of regional urbanisation		
13	Levels of population's education		
14	Labour qualification : number and type of		
15	diplomas per year		
	Health-hygiene : number of inhabitants per doctor and per hospital beds		
	"ECONOMY AND SOCIETY"		"ECONOMY AND SOCIETY"
16			
17	Active population distribution by activity sectors	70	National GDP/capita and standard of living
18	Demand/offer employment (unemployment rate)	71	National economic growth
19	Number and size of enterprises	72	World-wide economic growth
20	Firms productivity		
21	Local GDP/capita and standard of living		
	Regional economic growth		
	"BANKING AND FINANCIAL SECTOR"		"BANKING AND FINANCIAL SECTOR"
22			
23	Bank branches : number	73	Investment policy of the Turkish State
24	Co-operatives for credit, sale and development	74	Private investments in the rest of the country
25	Local private investors	75	Non-institutional foreign investments
	Local public investors	76	Institutional foreign investments : World Bank, etc.
	"AGRICULTURE"		
26			"AGRICULTURE"
27	Cultivated area by crop type	77	
28	Citrus productions : tonnage and yield	78	Domestic demand
	Other agricultural productions (vegetables,		Foreign markets
29	flowers): tonnage		
30	Fertilisers and other phytosanitary products (t/ha)		
31	Irrigated and greenhouse area		
	Farm distribution by size and by way of exploitation		
			"INDUSTRY"
32	"INDUSTRY"		
33			
34	Steel and iron factories		
	Fertilisers factories		
	Other industries		

Table 1. BLUE PLAN - ISKENDERUN PROJECT: FIRST LIST OF VARIABLES (continued)

	INTERNAL VARIABLES		EXTERNAL VARIABLES
	"ENERGY"		"ENERGY"
35	Electricity production by source		
36	Energy consumption by sector		
	"TOURISM"		"TOURISM"
37	Accommodation capacity (number of beds by type)	79	Competition among Turkish tourist centres
38	Tourist frequentation (number of overnight stays)	80	Area's insecurity
39	Origin of tourists by place of residence and socio-professional category	81	International tourism by country of origin and number of overnight stays
	"TRANSPORTS"		"TRANSPORTS"
40	Oil transportation by pipes	82	Fees from Iraq
41	Loading oil terminals	83	Geographic situation : Silk Road, door of the Middle East
42	Port installations' capacity		
43	Port installations unloaded tonnage (by product and origin)	84	Imports for GAP
44	Port installations · loaded tonnage (by product and origin)	85	GAP exports
45	Infra-regional road transports : number of trucks and transported tonnage	86	Electric interconnection
46	Turkey/Middle East road transit : number of trucks and transported tonnage	87	Supra-regional road transports (silos at Iskenderun)
47	Railroad traffic : capacity	88	Europe/Middle East road transit
48	Local air traffic : number of flights and of passengers, freight		
	"PUBLIC WORKS"		"PUBLIC WORKS"
49	Number and size of local enterprises	89	National firms
	"POLLUTION AND WASTE"		"POLLUTION AND WASTE"
50	Domestic liquid waste (volume, sewage, processing, waste)	90	Cross-frontier marine pollution
51	Industrial discharge (type of pollution, volume, etc.)		
52	Solid Waste		
53	Atmospheric pollution		
	"POLITICO-ADMINISTRATIVE SYSTEM"		"POLITICO-ADMINISTRATIVE SYSTEM"
54	Town council	91	Turkish government
55	Sub-prefecture	92	Ministries
56	Professional chambers	93	Bank of Provinces
57	State services	94	Regional and international geopolitic
58	Industrial zone		
59	Free trade zone		
60	Tourists development zone		
61	Protected zones (forests, archaeological sites)		

The following 12 sub-systems were selected :

- Nature
- Population and Society
- Economy and Society
- Banking and Financial Activities
- Agriculture
- Industry
- Energy
- Tourism
- Transports
- Public Works
- Pollution and Waste
- Political and Administrative System.

Table 2 shows the second and last list of variables. Their number has dropped to 66, based on 11 modules or sub-systems, the Banking and Financial Activities having been merged with Economy and Society.

The design of this list is different: after the status description given in the first list, we integrated the notions of "process" and "challenge/stakes" to choose the variables. This approach triggered the passage from the description of the current situation to that of future situations, keeping in mind the dynamic factors of the variables over time. The external characteristics of some variables were integrated and the differentiation no longer appears in the second list.

This is how, for example, the "water resources" variable in the "waste-pollution-conflicts" process is in fact one of the stakes of "mobilisation-distribution-preservation". Another example is the "high population increase" which, leading to a larger active population, entails a rising demand for employment. The complexity was not enhanced for all variables, either because it was not feasible, or because the major trends and current processes were directly identified (see hereunder, **3.5.**).

Table 2. BLUE PLAN - ISKENDERUN PROJECT: SECOND LIST OF VARIABLES

"NATURE"

1. Water resources to mobilise, distribute and preserve
2. Fertile agricultural soils to be reserved for agriculture
3. Land/sea interface : rationalise its occupation, preserve its natural potentialities (exchanges, natural environment)
4. Eco-systems. fragile and/or endangered, or rare species, (Caretta caretta, Fagus orientalis, avifauna)
5. Hilly region . planning difficulties, arboricultural potential
6. Sea/mountain and sea/agricultural fields landscapes.

"POPULATION AND SOCIETY"

7. Strong population increase, thus active population increase and pressure over employment
8. High urbanisation rate, thus risk of linear urbanisation along the coast
9. Housing demand
10. Health/Hygiene demand
11. Teaching/Training demand
12. Public services demand (administration, postal service,...)

"ECONOMY AND SOCIETY"

13. Primary sector : employment %
14. Secondary sector : employment %
15. Tertiary sector : employment %
16. Rate of regional activity compared to the rate of South-east Anatolia region (attraction effect ?)
17. Unemployment rates, thus income decrease, new urbanised people impoverishment, rural exodus
18. Public investments
19 Private investments
20. Regional GDP/capita (standard of living indicator)

"AGRICULTURE"

21. Usable agricultural area/coastal districts area
22 Regional agricultural productions/national agricultural productions
23. Value of agricultural production (indicators of its part in economy and of investment capacity)
24. Number and size of farms (indicators of agricultural soils vulnerability)
25. Number of tractors, quantity of fertilisers and of phytosanitary products by hectare (indicators of agriculture modernisation)
26. Irrigated and greenhouse crops area

"INDUSTRY AMONG WHICH CRAFT AND FARM PRODUCE"

27. Size and number of firms (indicators of integration to world's economy and of sector's dynamics)
28. Productions (products and quantity)
29. Productivity (indicators of modernity and of capacity to absorb unemployment)
30. Firm localisation (coast, near-by hinterland)
31. Local, national and international market (indicator of integration to world economy and of transport demand)
32. Specific regional products
33. Origin of transformed raw-material

Table 2. BLUE PLAN - ISKENDERUN PROJECT: SECOND LIST OF VARIABLES (continued)

"ENERGY"

34. Energy consumption by source and by sector (indicator of living standard and of increase of demand)
35. Thermal power-stations (potential power, production, localisation, energy sources and origin)
36. Distribution and marketing (network, prices, companies)

"TOURISM"

37. Accommodation capacity (number of beds by type)
38. Tourist frequentation (number of overnight stays)
39. Origin of tourists residence and by socio-professional category
40. Catering sector (type, employment)
41. Specific tourist offer (cruise, natural and historical sites)

"TRANSPORTS"

42. Transit regional function among which maritime, road and railway traffic, thus oversized of infrastructures, land occupation and nuisance
43. Incomes from transit function (dependency and fragility)
44. Number, size and registered address of transport firms (indicator of regional's transport system dependency)
45. Means of transport (type, age, capacity)
46. Land/sea and rail/road loading break-off (storing capacity, lifting equipment,...)
47. Air transports (freight and passengers): actual capacity (thus increase and previewed growth with GAP)

"PUBLIC WORKS"

48. Number, size and registered address of public work and civil engineering firms
49. Low aesthetic quality of building (thus landscape degradation therefore tourist potential)
50. Know-how (research consultancy), exports
51. Materials origin (availability and extraction impact)

"POLLUTIONS AND WASTES"

52. Domestic liquid waste (volume, sewage, processing, waste)
53. Industrial liquid waste (type of pollution, treatment)
54. Domestic solid waste (volume, collection, treatment, recuperation, storage)
55. Industrial waste and building waste
56. Atmospheric pollution (transport, heating, industries, power-stations and refineries)

"POLITICO-ADMINISTRATIVE SYSTEM"

57. Town council
58. Sub-prefecture
59. State services
60. Professional chambers
61. Union of municipalities of Iskenderun Bay
62. Environment protection association
63. Industrial zone
64. Free trade zone
65. Tourists development zone
66. Protected zones (forests, archaeological sites)

3.3. Social Accounting Matrix

Another tool was proposed for the Iskenderun Project: a social accounting matrix (cf. Appendix 3, J. Royer, Iskenderun Project: Suggestions for a Social Accounting Matrix, October 1990). It is designed to identify the main ties between the Iskenderun Region and the other parts of Turkey or the outside world.

This matrix (SAM for "Social Accounting Matrix") takes in account the production activities, the payment factors, the transfers to the main economic agents and finally the consumption of these agents (Table 3).

SAM is a matrix presenting the national accountancies of the UN. One of its original characteristics is that it can process social factors by selecting specific classifications for the first four categories. Households can therefore be classified by income, to highlight the poorest classes. There is also a choice between two (or more) business categories, throughout Production, to reveal the smaller firms, or better yet, those firms where production is low in comparison with modern activities. Another original feature would be to integrate sub-matrices in physical terms (tons of pollutants) or in population levels (active population), in the form of derived matrices.

3.4. Identification of Actors

The system knowledge implies identifying the actors involved, and this is done almost simultaneously with mapping and selection of variables. In a given system, understanding the role of the actors (in groups, individually, under conflict or in synergy) is essential to setting down the premices required by scenario construction.

Table 4 gives the list of actors at the local level, such as identified by the Blue Plan team, following the missions/meetings and preliminary studies. In this table, there are four action levels (local, provincial, national, international). The local level is the only one for which fifteen categories of actors were clearly recognised and thoroughly studied.

Table 5 shows a different approach, based on the principle of actors/users in the five fields of activity (agriculture, industry, energy, tourism, transportation), using or impacting upon environmental components (land, water, forests, air, coasts, sea), according to the four levels already defined.

In conclusion, fourteen groups of actors were retained, as follows:

- Population
- Associations for the Protection of the Environment
- Land Owners
- Professionals of Agriculture
- Professionals in Public Works
- Iskenderun Municipality
- Union of the Bay Communities
- Sub-Prefecture
- State Government
- Industrialists
- Transportation Professionals
- Trade Professionals
- Public Investors
- Private Investors

Table 3 : SOCIAL ACCOUNTING MATRIX (S.A.M.) (Condensed classification)

	1 PRODUCTION FACTORS	2 INSTITUTIONS	3 SAVINGS/INVESTMENT ACCOUNT	4 PRODUCTION ACTIVITIES	5 REST OF WORLD	6 TOTAL
1-PRODUCTION FACTORS	0	0	0	VALUE ADDED	NET FACTOR PAYMENTS FROM ABROAD	FACTOR INCOME
2-INSTITUTIONS	ALLOCATION OF FACTOR PAYMENTS	TRANSFERS	0	0	NET NON-FACTOR PAYMENTS FROM ABROAD	INCOME OF INSTITUTIONS
3-SAVINGS/INVESTMENT ACCOUNT	0	SAVINGS	0	0	BALANCE OF PAYMENTS DEFICIT	TOTAL SAVINGS
4-PRODUCTION ACTIVITIES	0	DOMESTIC CONSUMPTION	DOMESTIC INVESTMENT	INPUT/OUTPUT TABLE	EXPORTS	AGGREGATE DEMAND
5-REST OF WORLD	0	IMPORTED CONSUMPTION	IMPORTED INVESTMENT	IMPORTED INPUTS	0	TOTAL IMPORTS
6-TOTAL	FACTOR INCOME	INCOME OF INSTITUTIONS	INVESTEMENT	GROSS OUTPUT	FOREIGN RECEIPTS	-

Table 4. **BLUE PLAN - ISKENDERUN PROJECT : ACTORS**

LOCAL LEVEL	PROVINCIAL LEVEL	NATIONAL LEVEL	INTERNATIONAL LEVEL
1) Municipalities political parties			
2) Professional Chambers .Industry .Commerce .Transports .Agriculture			
3) Environmental protection association			
4) Co-operatives (clarify their role)	Regional unions	National unions	
5) Sub-prefecture	Prefecture	Ministry of Interior Government	
6) Army, Marine, Air Force	Military region	Ministry of Defence	
7) Local banks (what is their autonomy ?)	Banking network	Banking departments	International banks
8) Investors : private, public			
9) Education/Training - Schools		Ministry of Education	
10) Religious communities			
11) Oil terminal of Yumurtalik		Irak/Turkey Agreement	Iraq
12) Road transit-Truck drivers-Transport Companies			Suppliers/Purchasers
13) Maritime transports - ship owners			
14) NATO bases			NATO
15) Local population : .Cultural associations .Sports clubs .Trade unions .Family associations .Youth organisations			

Table 5

BLUE PLAN - ISKENDERUN PROJECT : ACTORS AND USERS

Sectors of activity Environmental components	Local level	Provincial level	National level	International level
Agriculture	Peasants without land, farm workers Agricultural workers-owners Chamber of agriculture		National market Bank of Agriculture Union of Agricultural Chambers	International market FAO NGO
	Agricultural co-operatives of credit	Regional union of agricultural co-operatives	Central union of agricultural co-operatives	
Industries, among which agro-food industries	Agricultural co-operatives for sale Company Managers		National Bank of Investments	
Energy	Industrial zones, free trade zone Dortyol oil terminal Yumurtalik oil terminal thermal power plants	Turkish industrial companies Oil agency Cukurova electric company	Industrial Turkish companies T.E.K.	Foreign companies, multinational companies World oil market Iraq
Tourism	Hotel keepers and similar (oil agency) renter-out, restaurant owners Museums and monuments	Urban customers of Adana and Hatay GAP workers Co-operatives	Tourist bank	Syrian inhabitants of the border zone Cultural tourism
Road transport Maritime transport Railroad transport	Agricultural and industrial products export		Ministry of Transport Coastal navigation	
Air transport	Iskenderun airport	Adana airport	Turkish airlines	IATA
Soils	Farmers Land owners Housing demand, builders Industrial land occupation, facilities dumps	Public work enterprises Department of irrigation	Department of roads DSI (Institute of hydraulic affairs)	Regional demand : pipe project
Waters	Farmers Domestic needs, municipal service Industrial needs	Bank of Provinces	Bank of Provinces	
Forests	Forestry firms Fuelwood needs Forest fires		Department of forests	
Air	Industrial pollution Domestic pollution Road transports		Laws and regulation	European standards
Coast	Rural exodus, urbanisation/coastal concentration Port installations, industries Tourists Caretta caretta, etc., natural ecosystems	association for environment protection	Ministry of Environment	UNEP and NGO
Sea	Urban, agricultural and industrial wastes Maritime traffic, ships wastes Accidents risks by hydrocarbons			REMPEC

As logical follow-up to their identification, the analysis of the game of the actors reveals antagonism, conflicts as well as synergy and convergence. One of the available tools is a "Strategy of Actors" table (see Table 6), which is a square matrix Actors/Actors, wherein:

- the boxes in the diagonal line are used to create the three-point "identification chart" of the actor (Objective, Issues, Means),
- the other boxes store data concerning the means by which this actor can impact upon each of the others, in order to reach his objective.

"Audit Patrimonial"[6], another available tool of analysis, is based on the active participation of the actors considered as experts in their field. This implies asking the opinion of pre-selected people, during semi-directive encounters and according to a pre-determined grid (see Appendix 4, "Approche Patrimoniale de la Gestion des Ressources et des Milieux Naturels"). When this method was used, for the Iskenderun Project, 43 such encounters occurred in the region under study, and 7 in Ankara. The results improved the understanding of the actors' motivations, as well as their differences of opinion or convergence of interests.

3.5. Constraints, major trends, processes

At the end of this first stage dedicated to the knowledge of the system of Iskenderun Bay, we elected to stress those facts which we feel are the most salient in terms of constraints and major trends. The difference between these notions results from the environment considered: constraints deal with natural environment, and major trends with facts of society (or facts resulting from socio-economic activities).

We were also able to highlight which processes were essential to evolution. A process can be defined as a group of phenomena, designed and organised over time, bringing into play resources and actors. We can differentiate between non-intentional current processes, reactive emerging processes and intentional pro-active processes.

3.5.1. Constraints

We selected the following main natural constraints:

- topography,
- agricultural soil,
- rare ecosystems including the remarkable fauna and flora.

Topography (or land survey) (Figure 7) in the Iskenderun Bay area reveals a striking contrast between the Northern and Western coasts on the one hand, and the Southern and Eastern coasts on the other.

The vast delta plain of the Seyhan and Ceyhan Rivers spreads over the North and West, with a limited hilly zone. The coastal plain in the East and South is very small, with sharp slopes only a few kilometres away from the coast. The Monts Amanos Range is obviously a heavy constraint for the development of economic and human activities

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[6] H. Ollagnon, Stratégie Patrimoniale pour la Gestion des Resources et des Milieux Naturels, Gérer la nature ? n° 15, 1990.

Table 6. **ACTORS STRATEGY**

Actors
Of Over
↓

↓	Population	Environmental Protection Association	Union of Districts of the Bay
Population	*Goals :* to improve life standard. *Problems :* housing, clothing, food, health, education, leisure. *Means :* to work and to earn more, get organized, vote.		
Env. Prot. Ass.		*Goals :* protection of environment, preservation quality of life. *Problems :* non control localization of activities, lack of financial means. *Means :* pressure on public powers, public awareness	
Union of Bay Dist.			*Goals :* to increase their power and their means to control the bay's planning process. *Problems :* to obtain from central government a sharing of powers, Common definition of Dvpt/Envt/Planning objectives. To adopt a common strategy for implementation. *Means :* to propose coherent projects, to negotiate with the government, to inform public opinion.

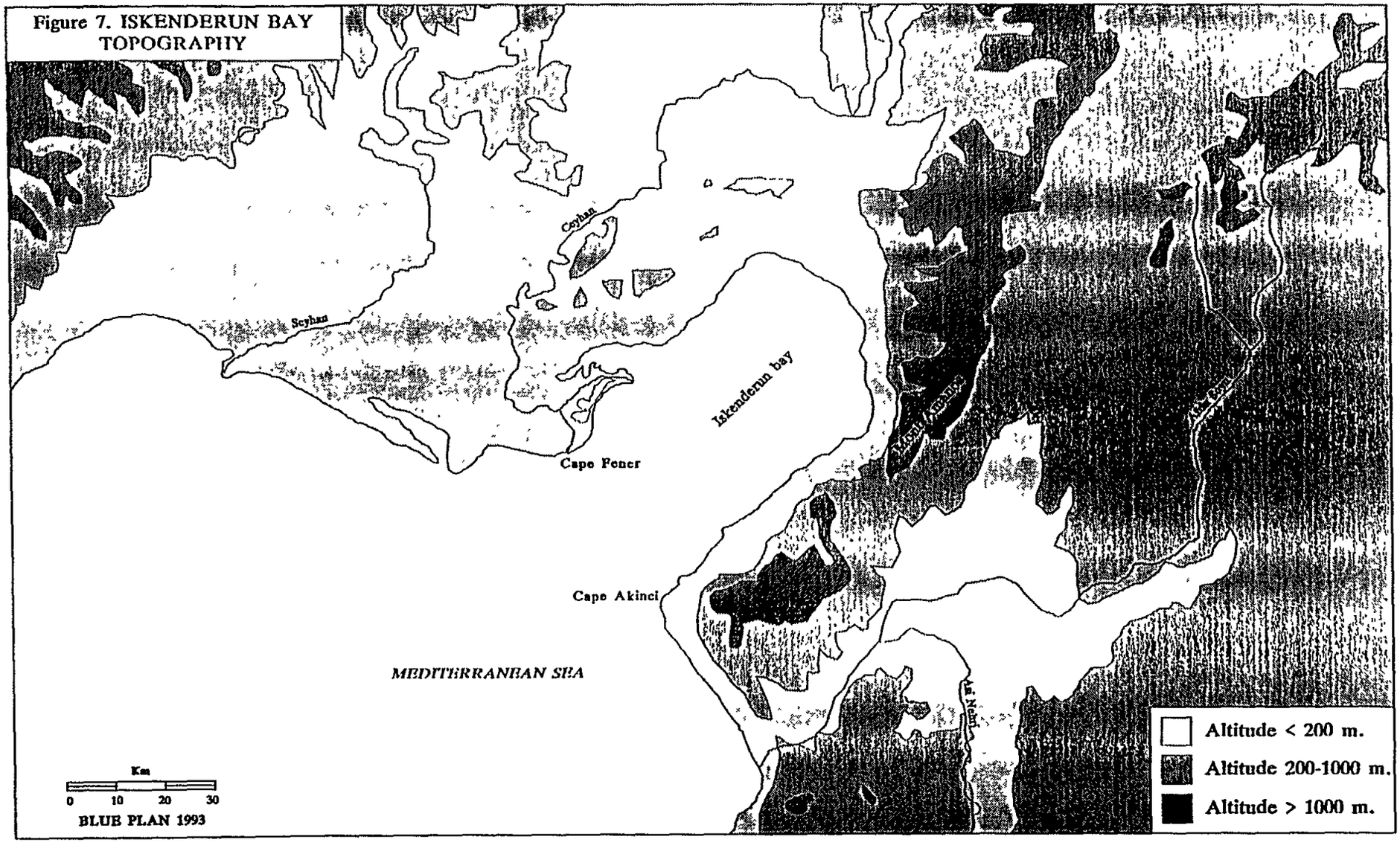


Figure 7. ISKENDERUN BAY
TOPOGRAPHY
Ceyhan
Seyhan
Iskenderun bay
Cape Fener
Cape Akinci
MEDITERRANEAN SEA
Km
0 10 20 30
BLUE PLAN 1993
Altitude < 200 m.
Altitude 200-1000 m.
Altitude > 1000 m.

In both coastal provinces of Iskenderun Bay, high-quality agricultural soil (Class I soil) is readily available and covers approximately 13 % of the province, i.e. twice the national average (Table 7). But for the country as a whole (high average altitude approx. 1 200m), the "quality agricultural soil" resource is extremely limited and must be rigorously and vigorously protected as the current and potential wealth it represents. This sets another heavy constraint for development and activities.

Rare ecosystems, such as lagoons and wetland delta zones, are represented by the breeding beaches of the sea-turtles, and by the zones used as nesting grounds or resting places during the migrating season (Figure 8).

The sea-turtles are an endangered species. The Iskenderun Bay area has several egg-laying sites, two of which at least are among the largest in the Mediterranean. These sites are essential to the species. This extends beyond local interest and is part of the overall ecosystem of the Mediterranean. The imperious necessity to protect these sites is another strong constraint for economic and human activities (material extractions, tourism, leisure).

There are two important sites for the avifauna: one is located immediately near the sea-turtles' beach, the other is in a pass of the Amanos Mountain Range, which forms the biogeographical border between the Mediterranean Region and the Syrian plateaus. During the migrating season, this pass is massively used by birds flying South from the Bosphor. It therefore is a passing area between Asia and Europe, and its interest in terms of ecology extends beyond the local framework.

3.5.2. Major trends

As regards the major trends, we emphasised population and urbanisation, transportation and bay pollution.

3.5.2.1. Population - Urbanisation

Four levels must be examined when trying to understand the dynamics of a given population: the country as a whole, the regions, the provinces and the coastal districts (see Appendix 5). The growth of the total population and of the urban population of the "Mediterranean" Region is still higher than the national average.

During the 1980-1985 intecensal period, the population (total and urban) of both coastal provinces of the Bay also increased much more than the national average. Between 1985 and 1990, the difference dropped. Observations made in the Hatay Province, over both periods, show a much greater increase in the rural population than in the national average.

The situation in the coastal districts of the two provinces is completely different. In the Adana Province, the two coastal districts only represent 8 % of the total area and 2.5 % of the population in 1990. Population increase in the Karatas district (difficult to pinpoint for 1980/1985 due to a new administrative division) is much lower from 1985 to 1990 than the overall province average, except for urban populations. The evolution in Yumurtalik district has taken an original turn: very low population growth associated with a very high urban population increase in 1980/1985, followed by a drop in 1985/1990.

Table 7 : SOILS CLASSIFICATION ACCORDING THEIR AGRICULTURAL CAPABILITIES

Land Use	Soil Quality Classes	Hatay (1)		Adana (2)		Total (1) + (2)		Turkey	
		Area (ha)	% / total	Area (ha)	% / total	Area (ha)	% total	Area (million ha)	% / total
Cultivable Area	I	69 916	13,3%	229 954	13,5%	299 870	13,4%	5,0	6,4%
	II	45 291	8,6%	118 087	6,9%	163 378	7,3%	6,8	8,7%
	III	51 363	9,8%	120 274	7,1%	171 637	7,7%	7,6	9,8%
	IV	28 470	5,4%	123 473	7,2%	151 943	6,8%	7,2	9,2%
	Total	195 040	37,1%	591 788	34,7%	786 828	35,3%	26,6	34,1%
Non Cultivable Area	V	583	0,1%	1 745	0,1%	2 328	0,1%	0,2	0,3%
	VI	50 083	9,5%	149 614	8,8%	199 697	9,0%	10,2	13,1%
	VII	276 995	52,7%	882 247	51,8%	1 159 242	52,0%	36,3	46,6%
	Total	327 661	62,4%	1 033 606	60,6%	1 361 267	61,0%	46,7	59,9%
Non Agricultural Area	VIII	2 435	0,5%	79 355	4,7%	81 790	3,7%	4,6	5,9%
	Total	2 435	0,5%	79 355	4,7%	81 790	3,7%	4,6	5,9%
TOTAL		525 136	100,0%	1 704 749	100,0%	2 229 885	100,0%	77,9	100,0%

Sources : First phase Iskenderun Report by turkish team and Blue Plan estimates for Hatay and Adana
Turkish Ministry of Agriculture and "La Turquie", CIHEAM, 1989 for Turkey

BLUE PLAN 1993

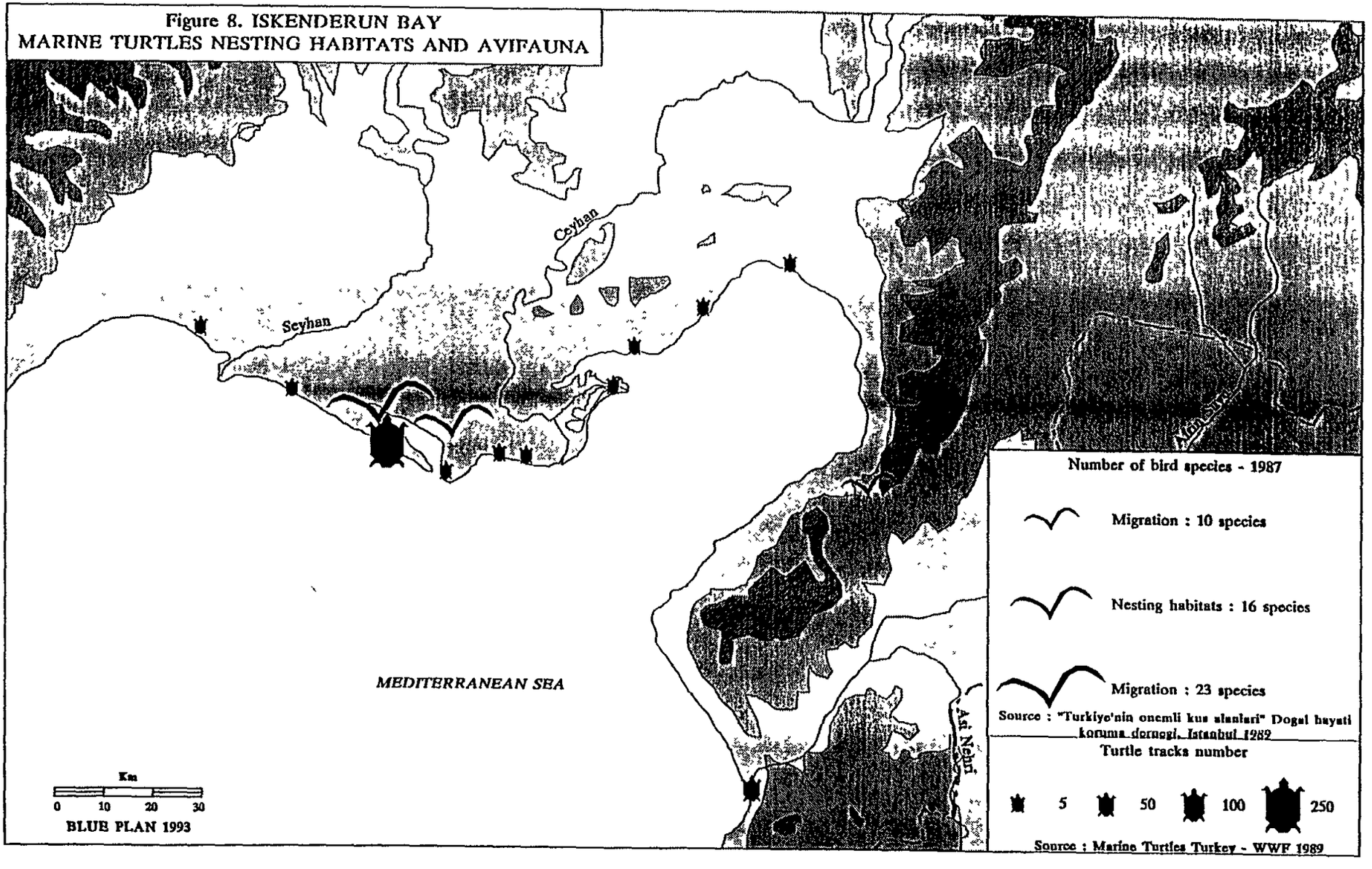


Figure 8. ISKENDERUN BAY
MARINE TURTLES NESTING HABITATS AND AVIFAUNA
Ceyhan
Seyhan
MEDITERRANEAN SEA
Asi Nehri
Km
0 10 20 30
BLUE PLAN 1993
Number of bird species - 1987
Migration : 10 species
Nesting habitats : 16 species
Migration : 23 species
Source : "Turkiye'nin onemli kus alanlari" Dogal hayati koruma dernegi, Istanbul 1989
Turtle tracks number
5
50
100
250
Source : Marine Turtles Turkey - WWF 1989

On the contrary, in the Hatay Province, the five coastal districts represent 41 % of the overall surface, and 46.5 % of the population. Population growth is very high from 1980 to 1985 and relatively low from 1985 to 1990. It is characterised by a leap in urban population in 1980/1985 (stabilised in 1985-1990) and by renewed growth of the rural population from 1985 to 1990.

Population density in the Hatay Province is 205 inhabitants/km^2 and in Adana, 112 inh/km^2 in 1990. Amongst the 10 Mediterranean provinces in Turkey (Figure 9), both provinces bordering the Iskenderun Bay are densely populated. Izmir Province alone demonstrates higher population figures.

The coastal districts of the area under study reveal great contrasts (Figure 10). Population density in both delta districts, Karatas and Yumurtalik, is respectively 29 and 42 inh/km^2 in 1990, whereas the figures are much higher for the same period in the districts of Iskenderun (368 inh/km^2), Erzin (292 inh/km^2 and Samadagi (234 inh/km^2). Recently, population density seems to be increasing in the Northern and Eastern parts of the Bay, while in the West and North, it appears to be stagnating.

The evolution of urbanisation rates may serve as indicator for potential rural exodus and internal migrations. Urbanisation rates in the Adana Province reach 70 % in terms of urban population in 1990, much higher than the national rate of 59 %. The situation is different in the coastal districts where rural populations are still the majority: they represent 66 % of the population in Karatas and 83 % in Yumurtalik.

In 1990, the population of Hatay Province is mainly rural, with an urbanisation rate of 48 %. Erzin and Iskenderun are the only coastal districts showing major urbanisation (respectively 77 and 60 %).

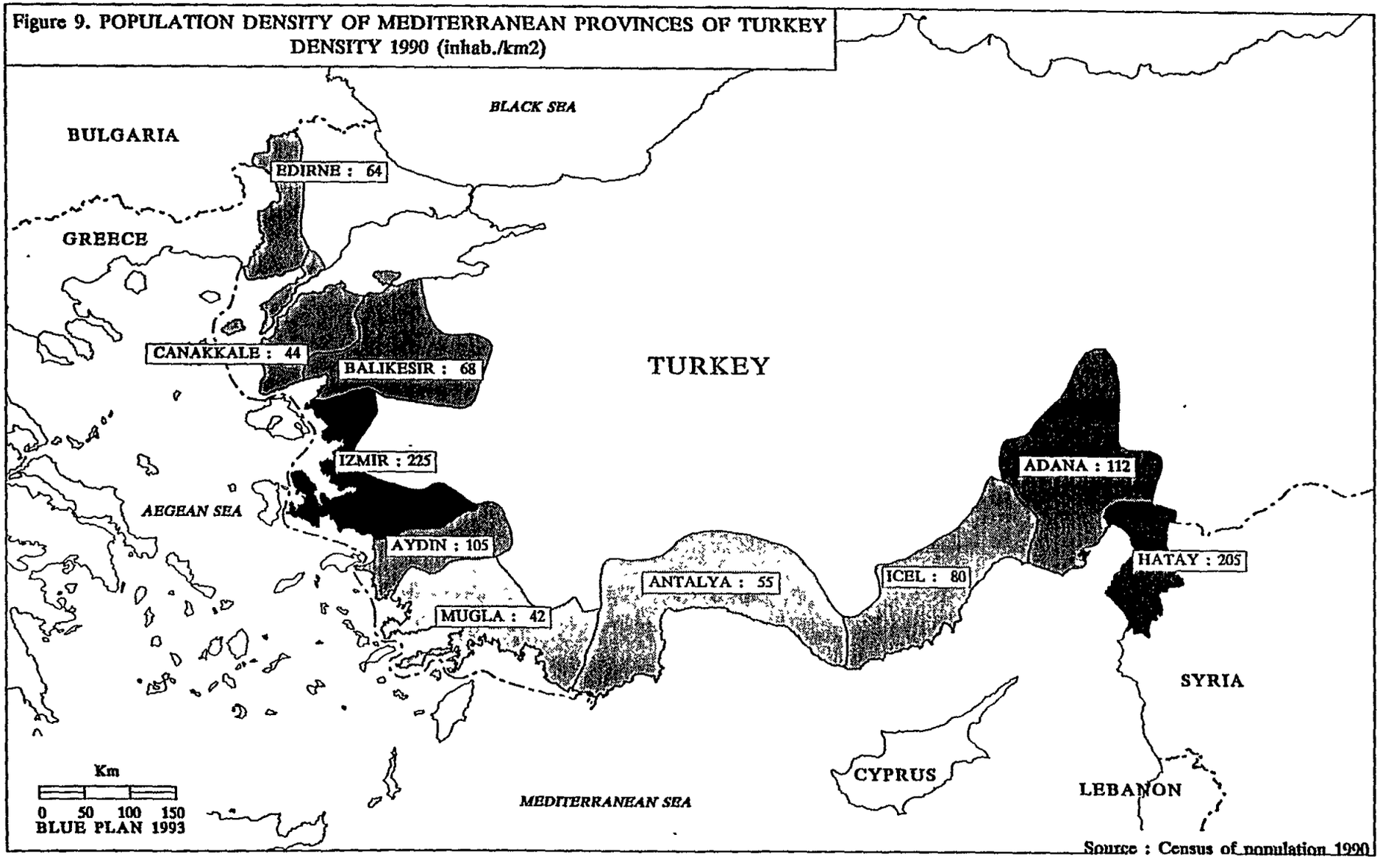
The districts of the study area therefore demonstrate a high potential for country to city migration.

Because of the pressures on the environment resulting from urban lifestyle (habitat, transportation, leisure), we felt it important to include in our observations the cities in and around the zone under study (Figure 11). Excepting Iskenderun, the largest cities are located on the immediate periphery of the considered area: Adana, Mersin, Tarsus, Antakya, Osmaniye for the largest. Table 8 shows the evolution of the population in five cities around (or near) the Bay, multiplied by 7.8 in 40 years.

3.5.2.2. Transportation

Through mapping (see Figure 6 above), we highlighted the hypertrophy of "Transportation" function within the system of Iskenderun Bay. From this, we can deduce the impact of the "Transit" function. There are multiple implications, involving marine space, coastal zones, exchanges, employment, etc. They are also interdependent on internal and external factors, such as local investment, State investment in major projects such as GAP, the international context such as the Gulf War and its aftermath.

Figure 9. POPULATION DENSITY OF MEDITERRANEAN PROVINCES OF TURKEY
DENSITY 1990 (inhab./km2)



Source : Census of population 1990

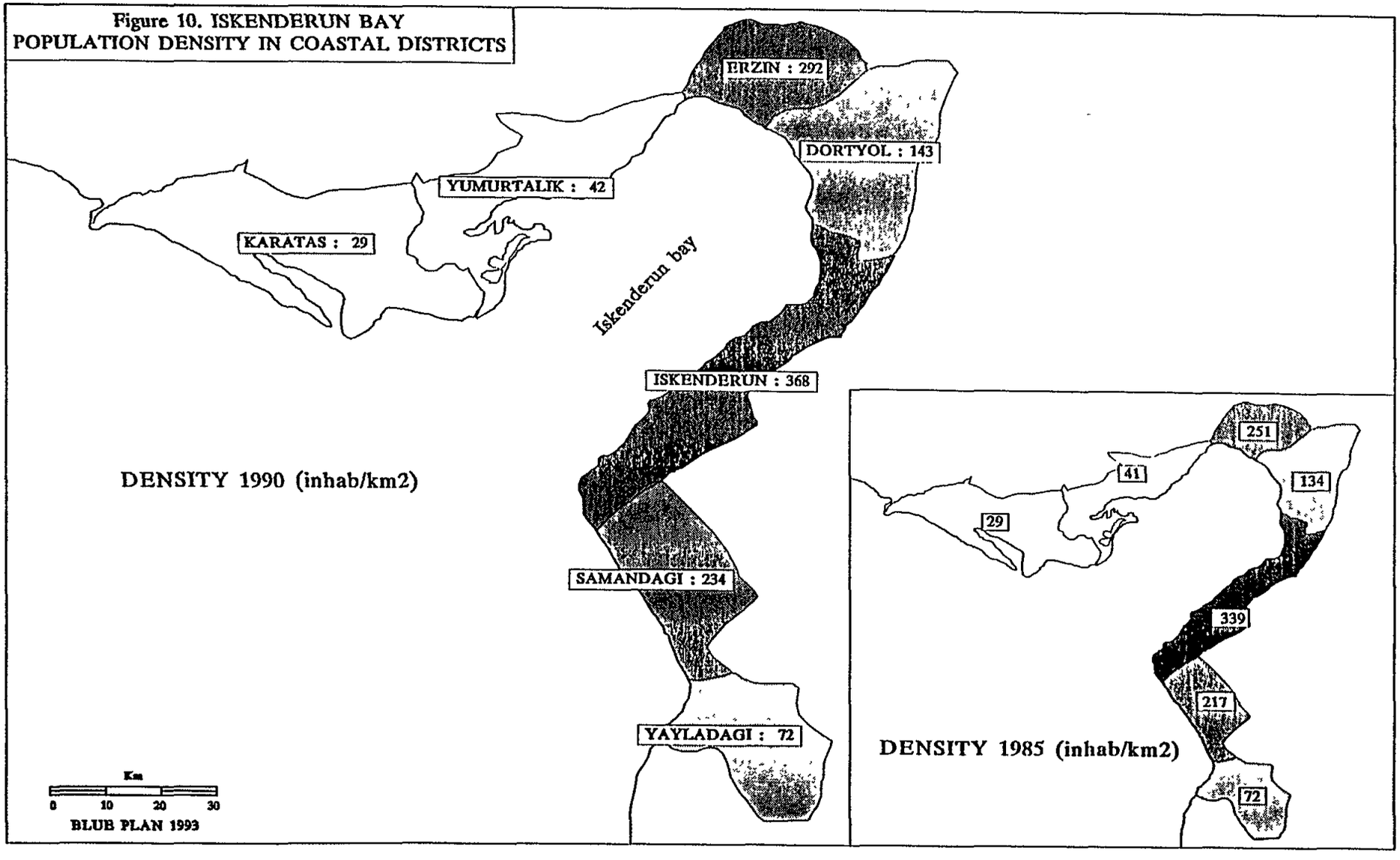


Figure 10. ISKENDERUN BAY
POPULATION DENSITY IN COASTAL DISTRICTS
ERZIN : 292
DORTYOL : 143
YUMURTALIK : 42
KARATAS : 29
Iskenderun bay
ISKENDERUN : 368
SAMANDAGI : 234
YAYLADAGI : 72
DENSITY 1990 (inhab/km2)
Km
0 10 20 30
BLUE PLAN 1993
251
41
134
29
339
217
72
DENSITY 1985 (inhab/km2)

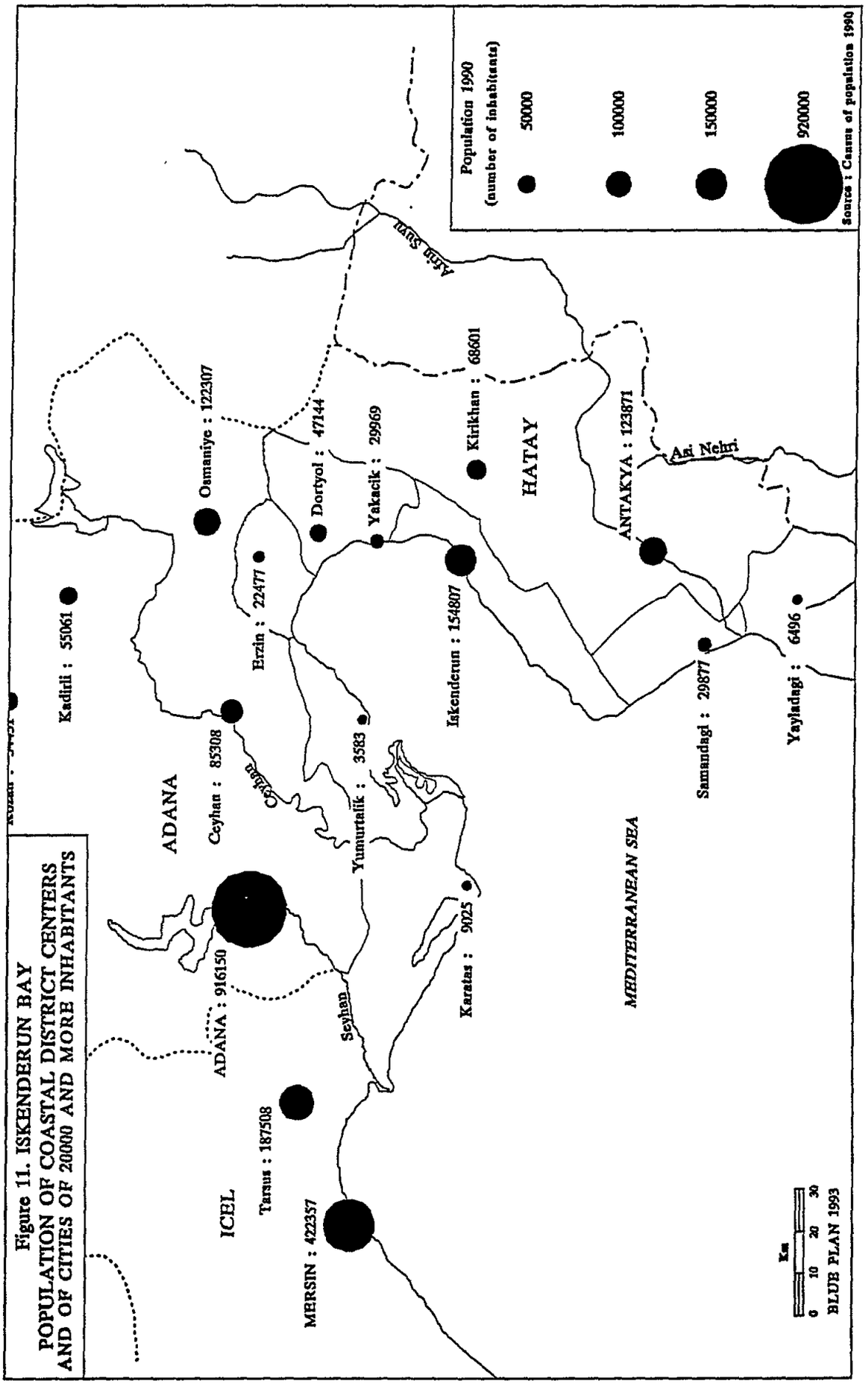


Figure 11. ISKENDERUN BAY
POPULATION OF COASTAL DISTRICT CENTERS
AND OF CITIES OF 20000 AND MORE INHABITANTS
Population 1990
(number of inhabitants)
50000
100000
150000
920000
Source : Census of population 1990
ADANA
ICEL
HATAY
Kadirli : 55061
Osmaniye : 122307
Ceyhan : 85308
Erzin : 22477
Dortyol : 47144
Yakacik : 29969
Kirikhan : 68601
ANTAKYA : 123871
Iskenderun : 154807
Yumurtalik : 3583
Karatas : 9025
Samandagi : 29877
Yayladagi : 6496
ADANA : 916150
Tarsus : 187508
MERSIN : 422357
Ceyhan
Seyhan
Asi Nehri
MEDITERRANEAN SEA
Km
0 10 20 30
BLUE PLAN 1993

Table 8 : EVOLUTION OF THE POPULATION OF FEW CITIES AROUND ISKENDERUN BAY

Population	1950	1955	1960	1965	1970	1975	1980	1985	1990
ADANA	117 642	168 628	231 548	289 919	347 454	475 384	574 515	777 554	916 150
CEYHAN	17 864	23 408	31 592	41 124	51 183	62 909	57 307	75 624	85 308
ISKENDERUN	22 872	46 850	62 061	69 382	79 297	107 437	124 824	152 096	154 807
MERSIN	36 463	50 104	68 485	86 692	112 982	152 236	216 308	314 350	422 357
TARSUS	33 704	39 182	51 184	57 737	74 510	102 186	121 074	146 502	187 508
TOTAL	228 545	328 172	444 870	544 854	665 426	900 152	1 094 028	1 466 126	1 766 130

Annual Growth Rates	1950 1955	1955 1960	1960 1965	1965 1970	1970 1975	1975 1980	1980 1985	1985 1990
ADANA	7,47%	6,55%	4,60%	3,69%	6,47%	3,86%	6,24%	3,33%
CEYHAN	5,55%	6,18%	5,42%	4,47%	4,21%	-1,85%	5,70%	2,44%
ISKENDERUN	15,42%	5,78%	2,26%	2,71%	6,26%	3,05%	4,03%	0,35%
MERSIN	6,56%	6,45%	4,83%	5,44%	6,15%	7,28%	7,76%	6,08%
TARSUS	3,06%	5,49%	2,44%	5,23%	6,52%	3,45%	3,89%	5,06%
TOTAL	7,50%	6,27%	4,14%	4,08%	6,23%	3,98%	6,03%	3,79%

Source : Official Census

BLUE PLAN 1993

Sea transportation is a secular tradition in the Iskenderun Region and a more recent trend with the extension of the Iskenderun Harbor, the construction of oil terminals, and loading/unloading docks for local industry (fertilisers and steel works). The port's capacity (reception facilities and warehouses) reaches 3.4 million tons per year and 170 000 m^2. Its competitor is Mersin Harbor, closer to Adana's agricultural and industrial basin, and where reception facilities are larger (7 million tons per year and 670 000 m^2).

Oil from Irak and national production from the Batman oil field are exported from both oil terminals at Yumurtalik and Dortyol. Before the embargo on oil from Irak, oil shipments reached 75 million tons per year (i.e. one fourth of the crude oil transiting through the Mediterranean).

Land transportation networks (Figure 12) connect the area to its hinterland and neighbouring countries. Road transit of goods has grown considerably throughout Turkey (see Appendix 6). Iskenderun Bay is part of this trend because of its specific geographical position (harbour and border zone).

Land transportation networks are dense in the coastal plain on the Eastern side of the bay, and constitute a major trend in terms of land use and harmful effects (air pollution, noise, ground and water pollution). They also represent regional wealth in a transportation-oriented area, since Iskenderun was one of the outlets of the Ancient Silk Route.

Transportation, both on land and sea, is a challenging factor in the Development/ Environment of the bay area.

3.5.2.3. Pollution in the Bay[7]

It must be remembered that pollution in Iskenderun Bay is partly the reason for the Project itself. In fact, it is difficult to evaluate the pollution level in the bay. Visible pollution (macro-waste) is more striking than dangerous in the public eye, whereas invisible bacteriological or physico-chemical forms of pollution are much more aggressive for Man and living organisms in general. Sea water and sediment pollution measurements are difficult to assess and long-term effects hard to evaluate. Nevertheless, we were able to use results of some studies implemented in the bay.

Figure 13 shows the consequences of a mini-black tide in the bay, caused by a ruptured pipe near a river. The volume of this form of accidental pollution only represented 8 000 tons of crude spilling into the bay through the Ceyhan river, but the breakdown map gives a good idea of the potential impacts such a disaster may have in the bay, which is a hypothesis to consider, in view of the heavy traffic.

Figure 14 reveals the results of the measurements of plastic matters found in the Bay which seem to trap waste of national (garbage disposal at sea) and international origin. It has effectively been proven that waste from the Southern and Eastern Mediterranean, as well as from passing cargoes, are transported by currents into Iskenderun Bay. This waste has considerable effects which can prove harmful for the population and dangerous for sea fauna.

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[7] Data on bay pollution was taken from the work carried out by the Institute of Marine Sciences in Erdemli.

Figure 12. ISKENDERUN BAY
ACTUAL AND PROJECTED TERRESTRIAL TRANSPORTS

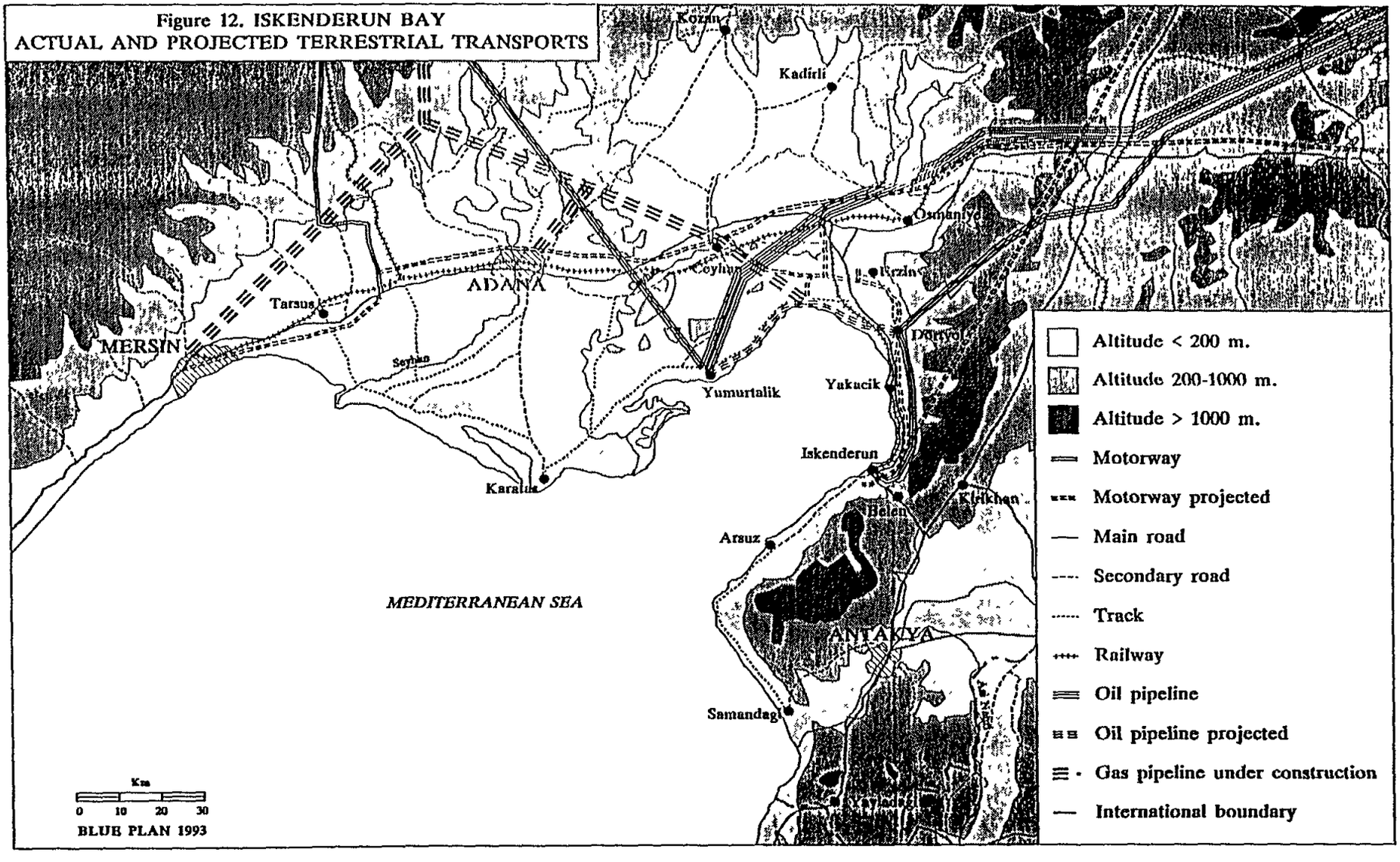


Figure 13. ISKENDERUN BAY
MARINE POLLUTION
OBSERVED OIL SLICK DISTRIBUTION IN PETROLEUM POLLUTION (April - May 1982)

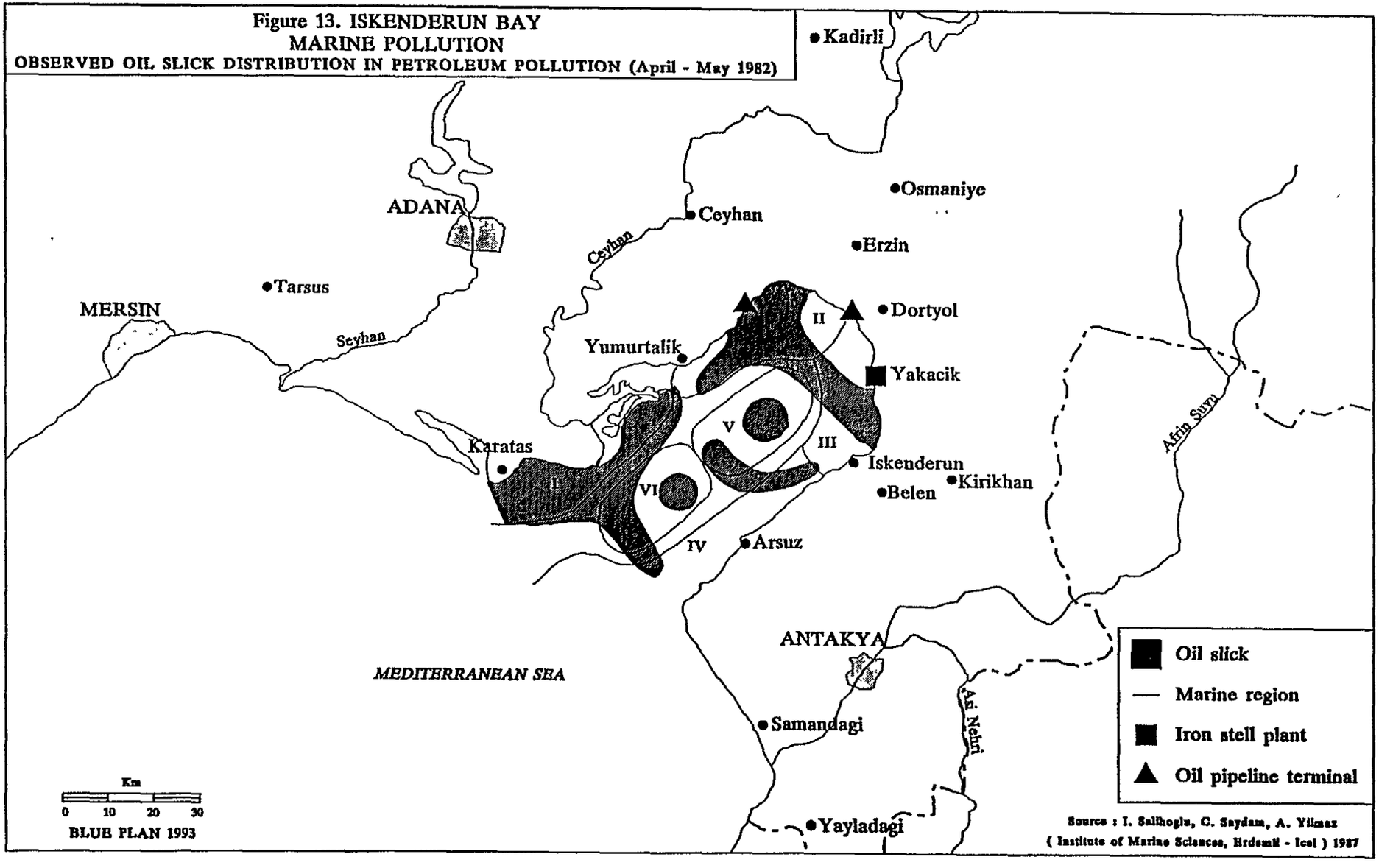
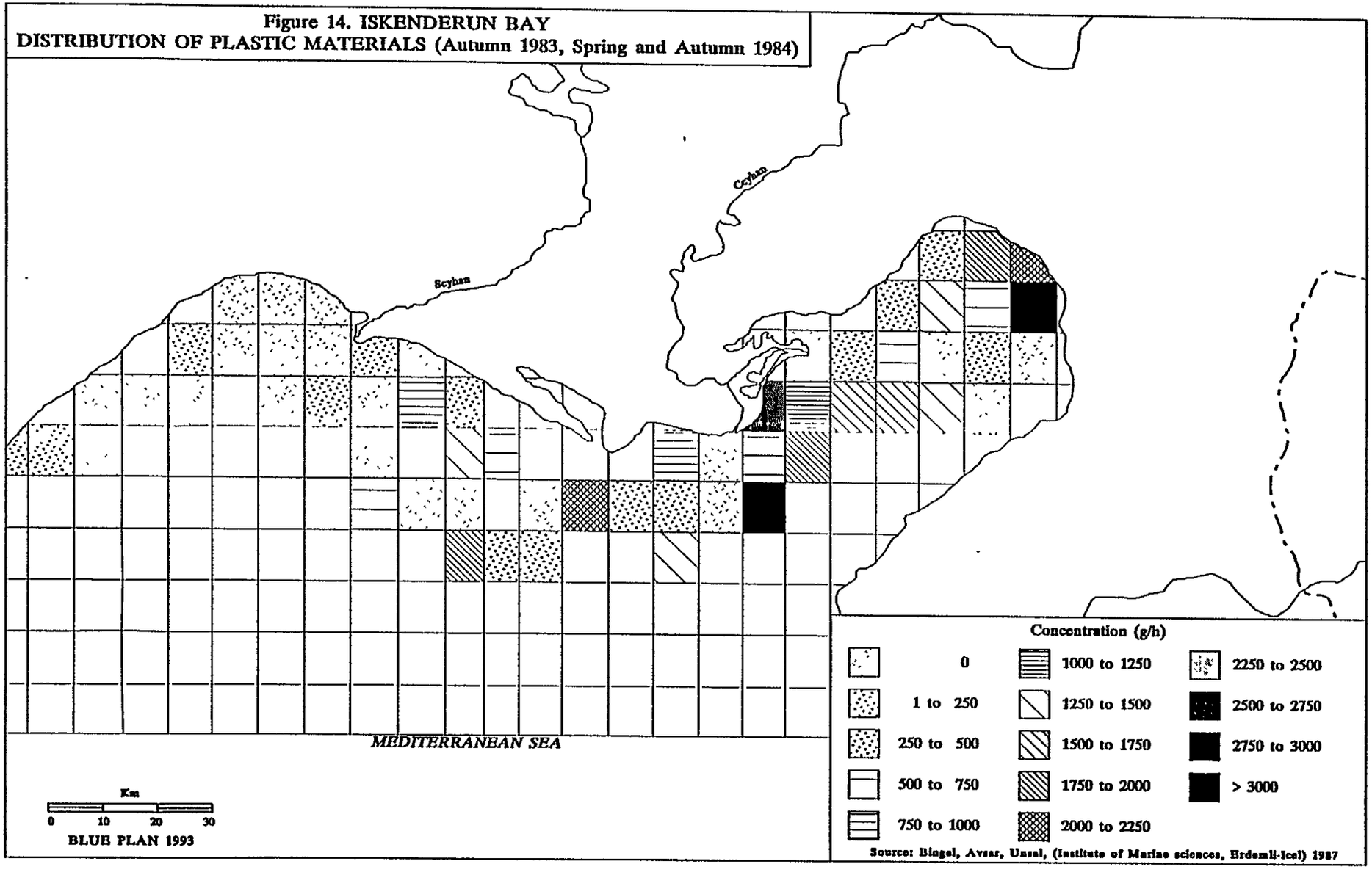


Figure 14. ISKENDERUN BAY
DISTRIBUTION OF PLASTIC MATERIALS (Autumn 1983, Spring and Autumn 1984)



Intensive agriculture in the Cukurova Plain is source of sea pollution, through rivers and running waters which transport fertilisers, pesticides and phyto-sanitary products. We are familiar with transfer mechanisms, but do not have at our disposal any information on the concentration of these pollutents in marine sediments and organisms. A recent study reveals the tonnage used over a ten-year period in Adana and Icel provinces (see Appendix 7).

Heavy metal pollution is caused by both industrial waste and port activities. However, large industries process and control liquid waste before it is discharged in the sea.

Pollution measure from domestic waste are not available, at present, in the Bay. However, the beach at Iskenderun Bay has been closed to swimmers for several years. Until now, no coastal city had a water collection and treatment plant. A huge program is currently underway to remedy the situation in coastal cities, actively supported by the Bank of the Provinces. However, heavy investments are necessary, and unprocessed waste is still a current fact and will remain so in the near future.

Rivers flowing into the Bay also contribute to its pollution, by bringing in all domestic and industrial waste discharged upstream.

Although there are few assessments of the impact of general pollution on the marine environment, it is clear that pollution levels in the Bay continue to increase yearly. The fight against pollution represents high stakes for public health and for the conservation of the marine environment (and therefore of marine resources), as well as for the development of touristic bathing activities and water sports.

3.5.3. Processes

The interest of identifying ongoing processes lies in their synthetic features. One must remember that a process is defined as a group of phenomena, designed and organised over time, bringing into play resources and actors. Through this approach, it is possible to understand and demonstrate which project has been, is being or will be implemented, who are the actors involved, in which fields and for which objectives.

Table 9 lists the processes identified by the Blue Plan team. This is of course a subjective evaluation and is in no way exhaustive.

Ongoing processes are largely trend-driven. They reveal the perverse effects of projects (for example, the investments made in steel works or transportation to further economic growth) which were initially perfectly justified, but where the follow-up operations -or anticipation of related harmful effects- lacked rigour and/or means.

Emerging processes are much more fascinating. They are in fact sources of mutation which will serve as basis for determining alternative solutions for the future of the area. There are two processes of this type: reactive processes which deal with unbearable situations to find corrective measurements; they fight against an existing situation. Pro-active processes reveal a more voluntarist and innovative approach, since they act upon a situation that does not yet exist.

In the case of Iskenderun Bay, it is interesting to note that a number of local and central administration actors are collaborating on corrective and innovative projects.

Table 9. **BLUE PLAN - ISKENDERUN PROJECT: PROCESSES**

UNINTENTIONAL UNDERGOING PROCESSES

- Linear urbanisation of the coast in the coming 20 years
- Industrialisation along the coast through public and private investments (Isdemir, industrial zone, Botas, Toros, free trade zone)
- Transit function reinforced by the motorway under construction and by GAP project
- Bay pollution (cross-frontier pollution, domestic and industrial wastes, risk of accidents with hydrocarbons)
- Degradation of the coastal landscapes by an anarchic spatial lan use and buildings with second rate visual quality
- Rural exodus inducing to urban growth, housing demand, employment demand in industry and services
- Intensification of agriculture (inputs demand, pollution risks)
- Domestic tourist migration.

REACTIVE EMERGENT PROCESSES

- Environment protection of the bay, partly following Protection Association' s initiative
- Struggle against pollution through government' s action (laws and rules, assistance to urban equipment)

PRO-ACTIVE INTENTIONAL PROCESSES

- Union of municipalities of the bay
- Will to establish a Management Plan for the coast
- Will to diversify economic activities (tourism development)

4. ISKENDERUN BAY PROSPECTIVE

4.1. Hypotheses

At the end of the "System Knowledge" stage, the teams of Ankara University and the Blue Plan worked together on finding the hypotheses for both scenarios (trend and alternative) for Iskenderun Bay, by the year 2025.

The variables are the same as those selected for the Blue Plan's global Mediterranean scenarios, i.e.:

- International context
- Population
- National Development Strategy
- Spatial management
- Consideration of the Environment.

Two facts must be underlined concerning the determination of the hypotheses for the bay scenarios:

- the teams were able to review the economic hypotheses of Mediterranean scenarios[8];
- the hypotheses for the bay scenarios were submitted to an assembly of local actors and representatives of central administrations, for debate and approval.

Tables 10 to 14 briefly present these hypotheses. They have rarely been quantified and still do not always make a clear distinction between the national level "Turkey" and the local level "Iskenderun Bay". Despite this simplification, (studied more in depth by J. Royer, Quelques Reflexions sur les Scénarios nationaux de la Turquie, Novembre 1992, Appendix 8), there is sufficient contrast between the hypotheses to construct future images of the bay and look for alternative solutions.

The Blue Plan team did not attempt to construct the scenarios for Iskenderun Bay. Its main task at this stage of the project was to illustrate results, by means of maps and drawings, (mainly involving population, urban and industrial development, transportation and bay pollution) and according to spatial management and environmental consideration hypotheses. Hypotheses on the international context and national development strategy remained underlying throughout the entire project and we worked to ensure global coherence.

From a methodological standpoint, the trend scenario was illustrated first, and potential risks and conflicts highlighted. Since we found this image of the area by 2025 to be unacceptable, we created another image of land use, based on alternative spatial management and environmental consideration policy. We then went from a negative scenario to a more desirable one.

Figures 15 and 16 show the results of population forecasts by 2025, the annual growth rate from 1990 to 2025 and district population density in 2025. Forecasts do not always take into consideration the series of administrative border modifications. This explains why no differentiation was made between the districts of Erzin and Dortyol, why results for

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[8] J. Royer -Réflexions sur une révision des hypothèses économiques des scénarios méditerranéens du Plan Bleu - une vue critique apres cinq années, september 1992.

Table 10.

"INTERNATIONAL CONTEXT" DIMENSION

Hypotheses for Development/Environment scenarios for Iskenderun Bay

HYPOTHESES	TREND SCENARIO	ALTERNATIVE SCENARIO
Geopolitical situation: triad	"cacophony" USA keep their leadership market regionalisation Latent protectionism, slowed-down world competence	Harmony USA accept competition, Opening up over world market Liberalisation
Economic growth (rate in %)	Weak growth USA: 2.3; Japan: 3.3 EEC: 2.5; South and East Mediterranean countries: 3.8/4	Stronger growth USA: 2.8; Japan : 3.9; EEC: 3.3; South and East Mediterranean countries: 4.6/5
Europe/Mediterranean ties	EEC less asserted, less well-off less generous EEC more interested in Eastern Europe	Strong Europe, opening of its market to Mediterranean countries
Eastern Mediterranean/Middle East	Instability, latent or real conflicts	Stability and co-operation
Turkish speaking republics of central Asia	Triangle Moscow/Turkish speaking republics/Turkey Moscow's influence remains strong Conflicting situation Turkey/Iran	Strong co-operation Turkey/Turkish speaking republics Free exchange zone
Black Sea countries	Obstacles to co-operation and development due to permanent ethnic problems in the ex-USSR	Co-operation and development have great importance in Turkey and Iskenderun Bay

Table 11. **"POPULATION" DIMENSION**

Hypotheses for Development/Environment scenarios for Iskenderun Bay

HYPOTHESES	TREND SCENARIO	ALTERNATIVE SCENARIO
Population Turkey today: 56 million, average growth of 2.1% of which 1.7% west and 2.3% East of a line Samsun/Iskenderun	Turkey: growth of 1.7% with some 100 million inhabitants by 2025	Turkey : growth of 1.4% with some 90 million inhabitants by 2025
Urbanisation. Urban rate today: 56.3% highly linked to regional and agricultural development	High and focused on big urban areas Iskenderun: 73% urban population district	Slowed down urbanisation, better balanced, between metropolis and middle- size cities At Iskenderun, GAP' s success leads to a strong urban growth
Migrations From South - East, they depend of politics	High rural exodus in Turkey as well as in Iskenderun	High brain drain from Turkey to Central Asia Turkish speaking republics (Engineers, teachers, professors) Iskenderun: better balanced migratory flux

Remarks: Links between population growth, urbanisation, migrations and economic development (notably industrialisation) are particularly complex. Thus, the success of GAP project would decrease in Iskenderun the migratory flux originated from South and East, but the development of Iskenderun region (because of GAP success) would have an opposite attraction effect on rural population.

Table 12. "NATIONAL DEVELOPMENT STRATEGY " DIMENSION

Hypotheses for Development/Environment scenarios for Iskenderun Bay

HYPOTHESES	TREND SCENARIO	ALTERNATIVE SCENARIO
Structural reforms in the economic sector (in process)	Slower rhythm	Faster rhythm
Administrative reforms (fiscality, decentralisation)	"	"
Investments	"	"
Integration to worldwide market	Weak	Stronger
GAP project (depends on financing)	Slow agricultural development	Fast development of agriculture and agro-food industries Stabilization of South-east provinces
Tourism (Present objective: double capacity in ten years)	Doubling of capacity almost only south-west in the country	Better geographical distribution of capacity, diversification (cultural tourism, ecology etc.)
Industrialisation	Iron-steel industry modernisation (WB: 300 M. US$) Extension: flat products	Diversification : mechanical and electrical industries
Energy	Stop projects of thermal power plants (coal and lignite) at Izmir and Bodrum moving to Yumurtalik	Gas, hydroelectrical, nuclear power plants

Table 13. **"SPATIAL MANAGEMENT" DIMENSION**

Hypotheses for Development/Environment scenarios for Iskenderun Bay

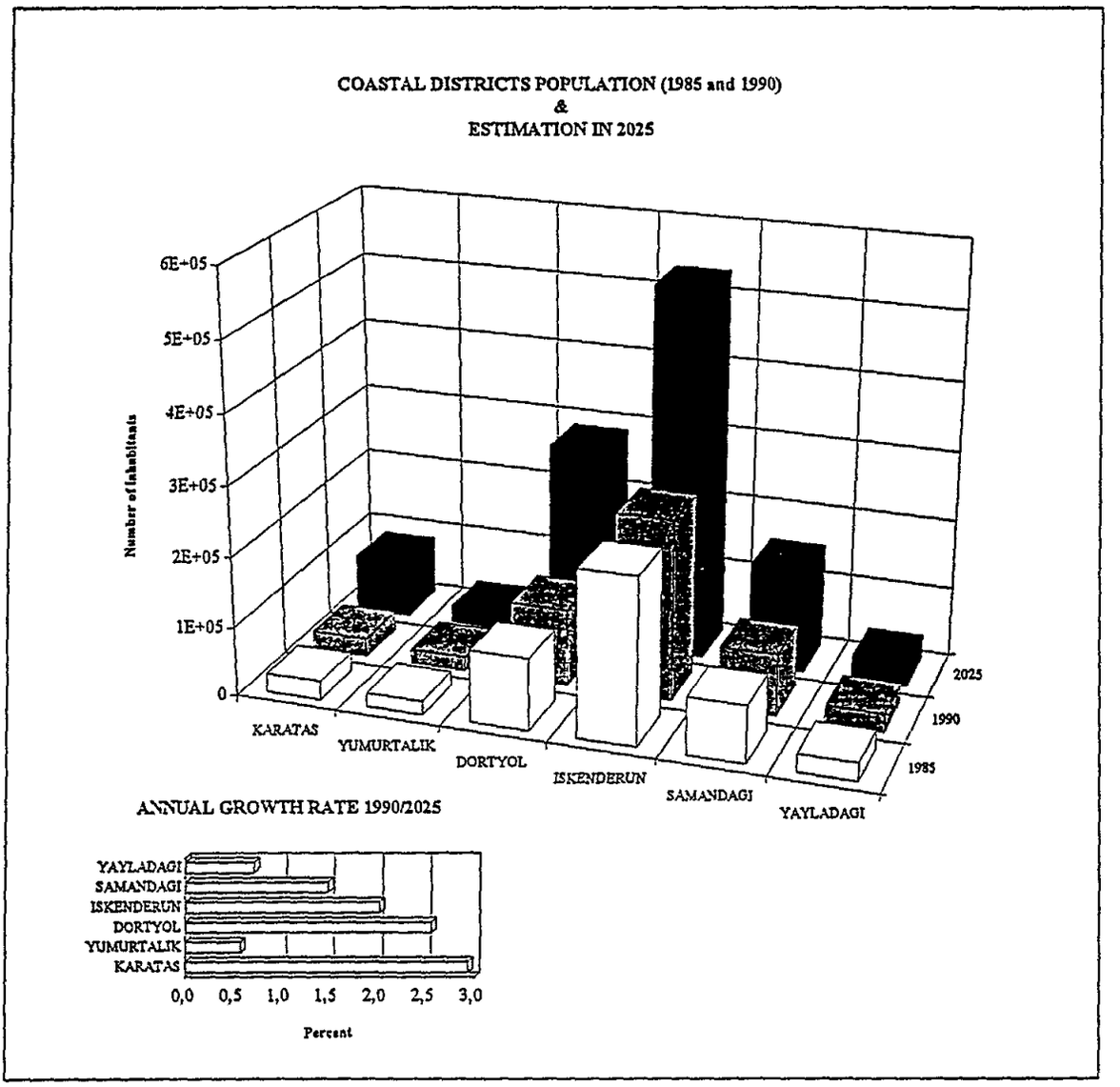
HYPOTHESES	TREND SCENARIO	ALTERNATIVE SCENARIO
Institutional and administrative aspect	Dysfunction and absence of coherence (cf. METAP rapport)	Reforms: efficiency, protection and balance
Transports Black Sea/Mediterranean Sea	Almost exclusive main road Samsun/Iskenderun	Traffic division between Mersin, Iskenderun and the other charging points of the bay
Motorways and railroads	Motorway master plan according to short-term profits and economical construction	"ecological" motorway layout, readjustment with rail transports (containers)
Free trade zones	Reappraisal	Suppression Preventive policy, anticipation
Protected zones	Curative action, blow by blow, under the pressure of emergencies	Landscape is considered as a resource
Landscape	Not taken in consideration	National policy for regional planning based on regional balance in terms of structuring equipment.
Regional planning	No coherent national policy competition between sites and duplication of equipment	Implementation of innovating structures for spatial management of Iskenderun Bay.

Table 14. **"TAKING IN CONSIDERATION OF THE ENVIRONMENT" DIMENSION**

Hypotheses for Development/Environment scenarios for Iskenderun Bay

HYPOTHESES	TREND SCENARIO	ALTERNATIVE SCENARIO
Role of the ministry of Environment	Limited responsibility and power Lack of financial means and of institutional and legal appraisals	Super-ministry, enlarged power
Consequences of the RIO conference	Limited follow-up of recommendations Media interested but unsuitable means	Sustainable development
Quality of environments	Lack of population's and decision makers awareness, curative actions	Taking in consideration ecological values, anticipation
Struggle against pollutions and nuisances	Concept of "polluter pays"	Economic tools for environment management
Natural resources management	Short term profits	Rational and patrimonial management

Figure 15 . COASTAL DISTRICTS POPULATION



Coastal districts	Population (Number of inhabitants) 1985	1990	2025		Annual growth rate 1985/2025 (Percent)
KARATAS	26317	26450	83717	(*)	2,9
YUMURTALIK	20345	20957	25530		0,6
DORTYOL	104166	111368	285852	(**)	2,6
ISKENDERUN	239381	259475	531987	(***)	2,0
SAMANDAGI	82934	89202	149679		1,5
YAYLADAGI	26342	26172	34970		0,7

(*) Population 1990 in district boundaries in 1980
(**) Population Erzin + Dortyol (2025)
(***) Population Iskenderun + Belen (2025)

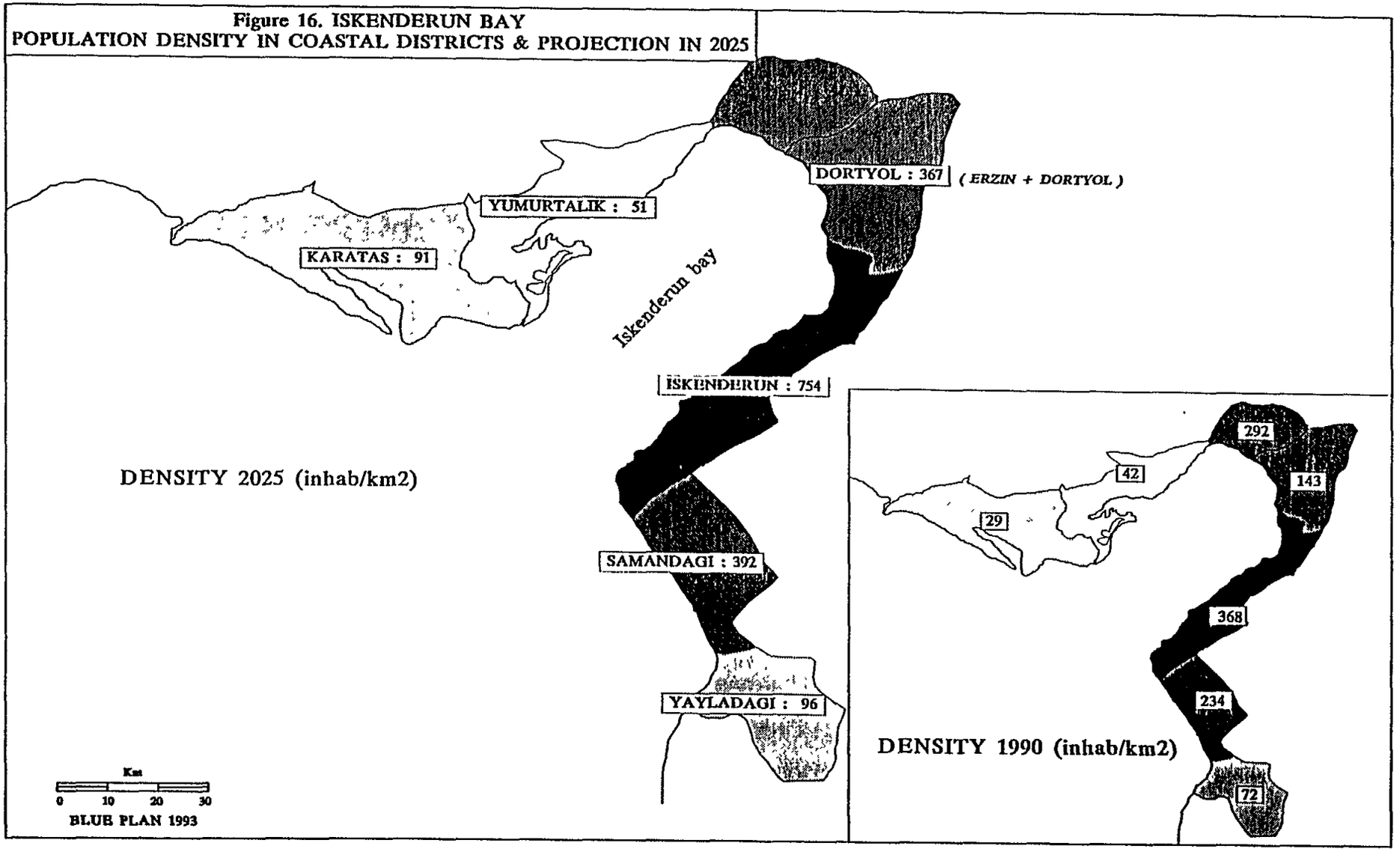


Figure 16. ISKENDERUN BAY
POPULATION DENSITY IN COASTAL DISTRICTS & PROJECTION IN 2025
DORTYOL : 367
(ERZIN + DORTYOL)
YUMURTALIK : 51
KARATAS : 91
Iskenderun bay
ISKENDERUN : 754
DENSITY 2025 (inhab/km2)
SAMANDAGI : 392
YAYLADAGI : 96
Km
0 10 20 30
BLUE PLAN 1993
292
42
143
29
368
234
DENSITY 1990 (inhab/km2)
72

Iskenderun Bay are based upon 1990 figures prior to border modifications (therefore Iskenderun + Belen) and why results for the district of Karatas are based on 1980 figures. The value of these figures can therefore only serve as an indication.

No "zero-status" was available for the images of land use by urban and industrial development. We therefore worked from a study[9] undertaken by the National Planning Organisation with support from the World Bank. The results are shown in Figure 17, highlighting urban and industrial areas in 1985 and their expansion by 2010, on the coastal zone between Yumurtalik and Arsuz. In the trend scenario, we surmised that these forecasts were in fact reality.

In order to quantify the impact of the GAP Project on the Iskenderun region and the future pressures of agricultural production on transportation networks, we calculated the current and future flows (Table 15) of agricultural production on the premise that 80 % of it would transit through Gaziantep, and was therefore likely to use all the transportation means in the bay area.

In the trend scenario, where transported tonnage is expected to double, we allotted specific evolution coefficients to each means of transportation, i.e.:

- trails become secondary roads;
- secondary roads become main roads;
- main roads become two-lane freeways;
- existing freeways and those being built increase to three lanes;
- the number of railways, oil and gas pipelines is multiplied by two;
- there are more loading/unloading zones, the traffic on sea routes is increased.

These coefficients were integrated in the map of land (Figure 12) and sea (Figure 6) transportation.

4.2. Prospective images of Iskenderun Bay in 2025 according to a trend scenario

These different combinations lead to a prospective image of urban and industrial development, of land and sea transportation means, in 2025 according to the trend scenario (Figures 18 and 19, the latter being an enlarged view of the area between Karatas and Arsuz).

Figure 18 gives a perfect picture of the limits of the prospective exercise, such as it was implemented around the bay. It does give the impression that no evolution is occurring in the Southern and Eastern parts of the zone. Cities like Adana, Antakya, Tarsus show no signs of expansion, etc. This is due to the fact that, having no "zero-status" of land occupancy to work from, the Blue Plan team did not allow itself to **invent** the current state of things in order to establish a basis for future analysis. This map should therefore be considered cautiously. This being said, and paradoxically, the so-called social and economic deserts in the West and South are not totally devoid of significance. The trend scenario is indeed characterised by moderate economic growth, inefficient social policies, by the quest

[9] Republic of Turkey, Prime Ministry, State Planning Organization -"Cukurova Metropolitan Region, Urban Development Project, Iskenderun Urban Expansion Area Feasibility Study", by the joint venture Dar Al-Handasah Consultants & Inbucon Management Consultants Ltd, Tk 8510, June 1986.

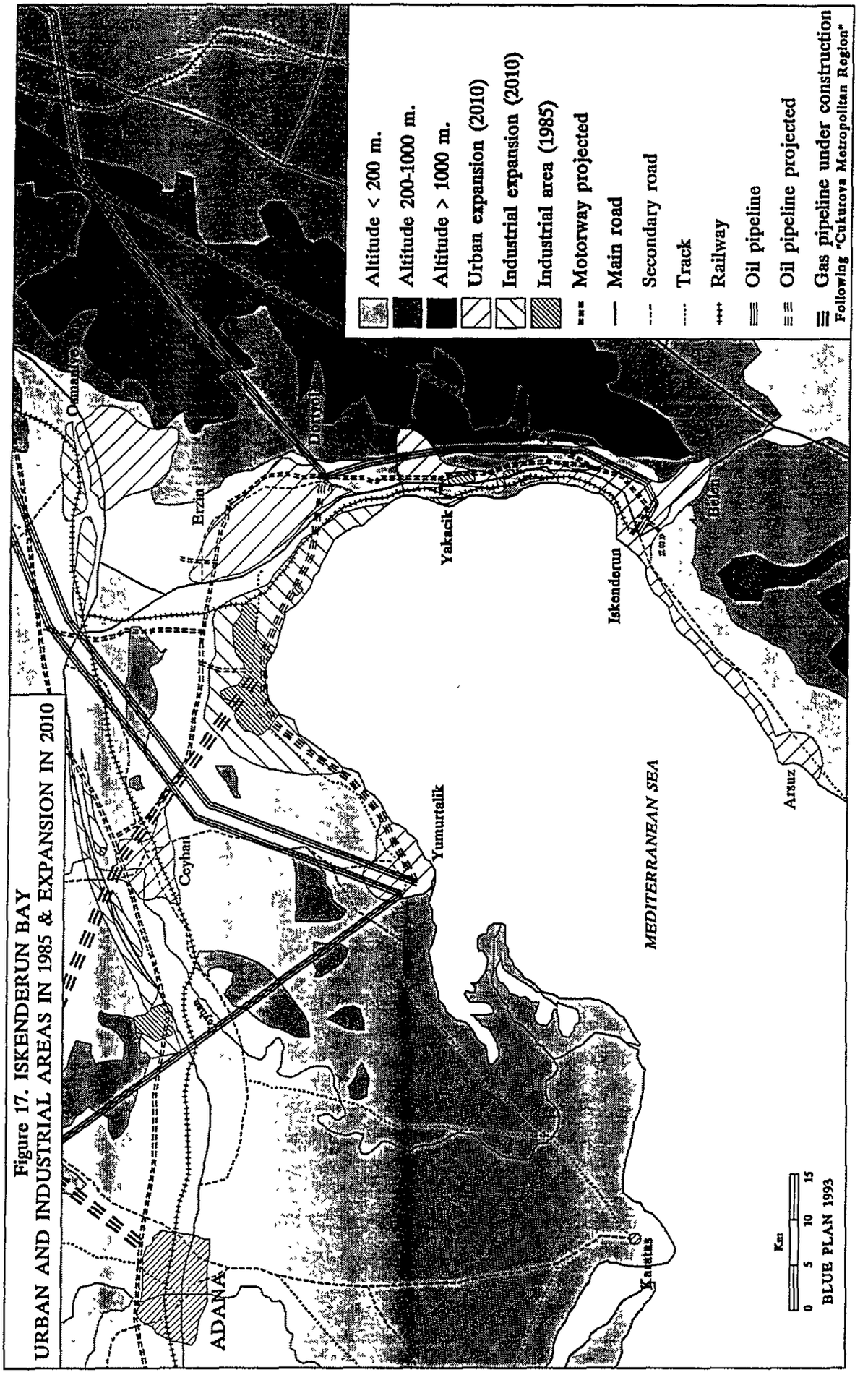


Figure 17. ISKENDERUN BAY
URBAN AND INDUSTRIAL AREAS IN 1985 & EXPANSION IN 2010
Altitude < 200 m.
Altitude 200-1000 m.
Altitude > 1000 m.
Urban expansion (2010)
Industrial expansion (2010)
Industrial area (1985)
Motorway projected
Main road
Secondary road
Track
Railway
Oil pipeline
Oil pipeline projected
Gas pipeline under construction
Following "Cukurova Metropolitan Region"
Osmaniye
Dortyol
Erzin
Yakacik
Iskenderun
Belen
Arsuz
Yumurtalik
Ceyhan
ADANA
Karatas
MEDITERRANEAN SEA
Km
0 5 10 15
BLUE PLAN 1993

Table 15. : AGRICULTURE PRODUCTION IN THE GAP REGION AND FLOWS TO ISKENDERUN

	TOTAL			FLOW TO ISKENDERUN		
	CURRENT PRODUCTION (1985)	AT FULL IRRIGATION DEVELOPMENT	BY 2005	CURRENT PRODUCTION (1985)	AT FULL IRRIGATION DEVELOPMENT	BY 2005
	(1000 tons)					
WHEAT	1 994	3 279	3 270	1 595	2 623	2 616
BARLEY	1 040	1 476	1 625	832	1 181	1 300
LENTIL	533	566	705	426	453	564
COTTON	177	859	478	142	687	382
TOMATO	215	1 584	1 024	172	1 267	819
OTHER VEGETABLES	1 066	1 368	1 181	853	1 094	945
POTATO	5	590	325	4	472	260
DRY BEANS	2	95	53	2	76	42
SESAME	16	107	70	13	86	56
GROUNDNUT	0	156	85	0	125	68
SUNFLOWER	5	160	91	4	128	73
SOYBEAN	0	316	158	0	253	126
MAIZE	16	281	150	13	225	120
RICE	11	108	83	9	86	66
TOTAL	5 080	10 945	9 298	4 064	8 756	7 438

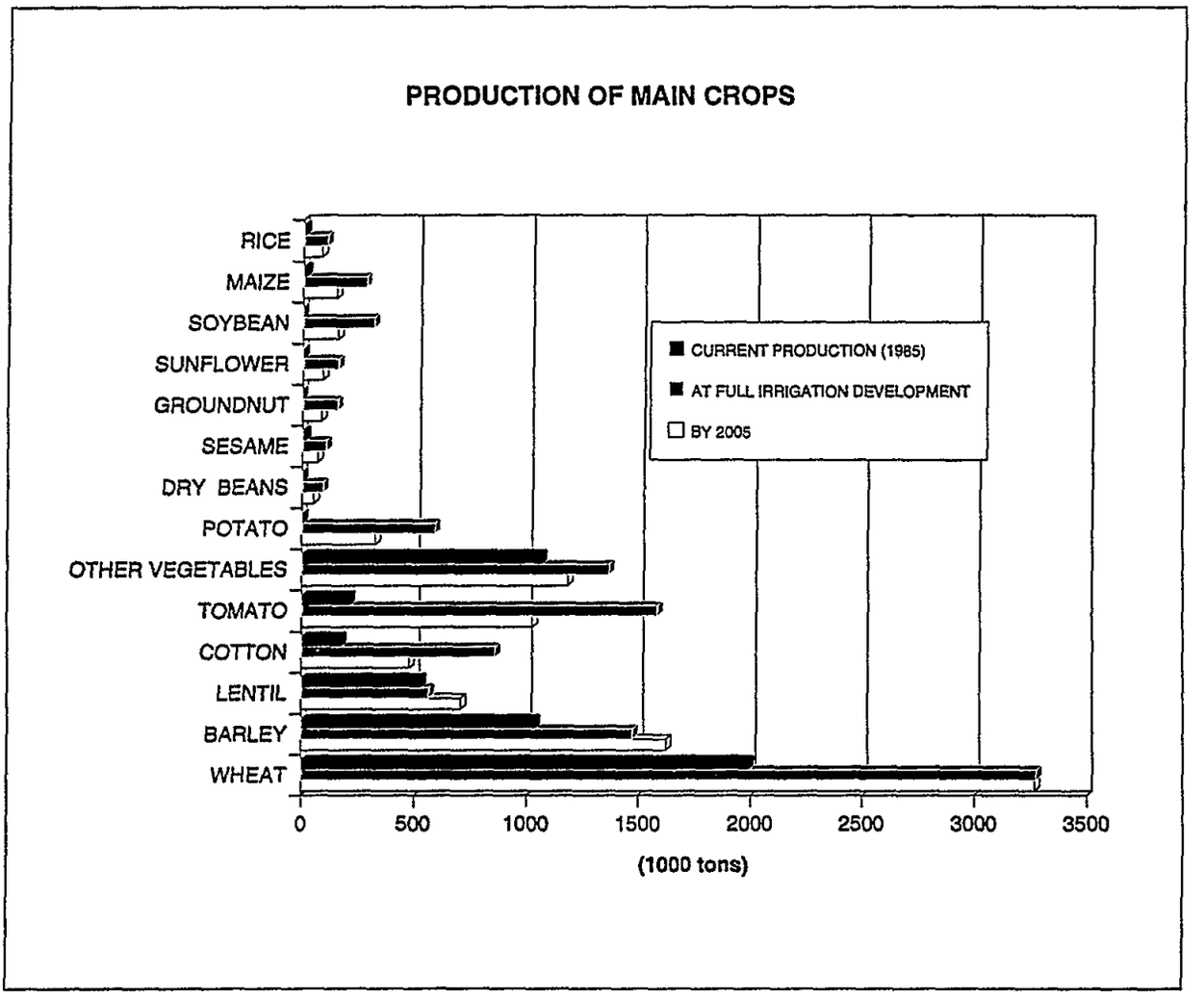
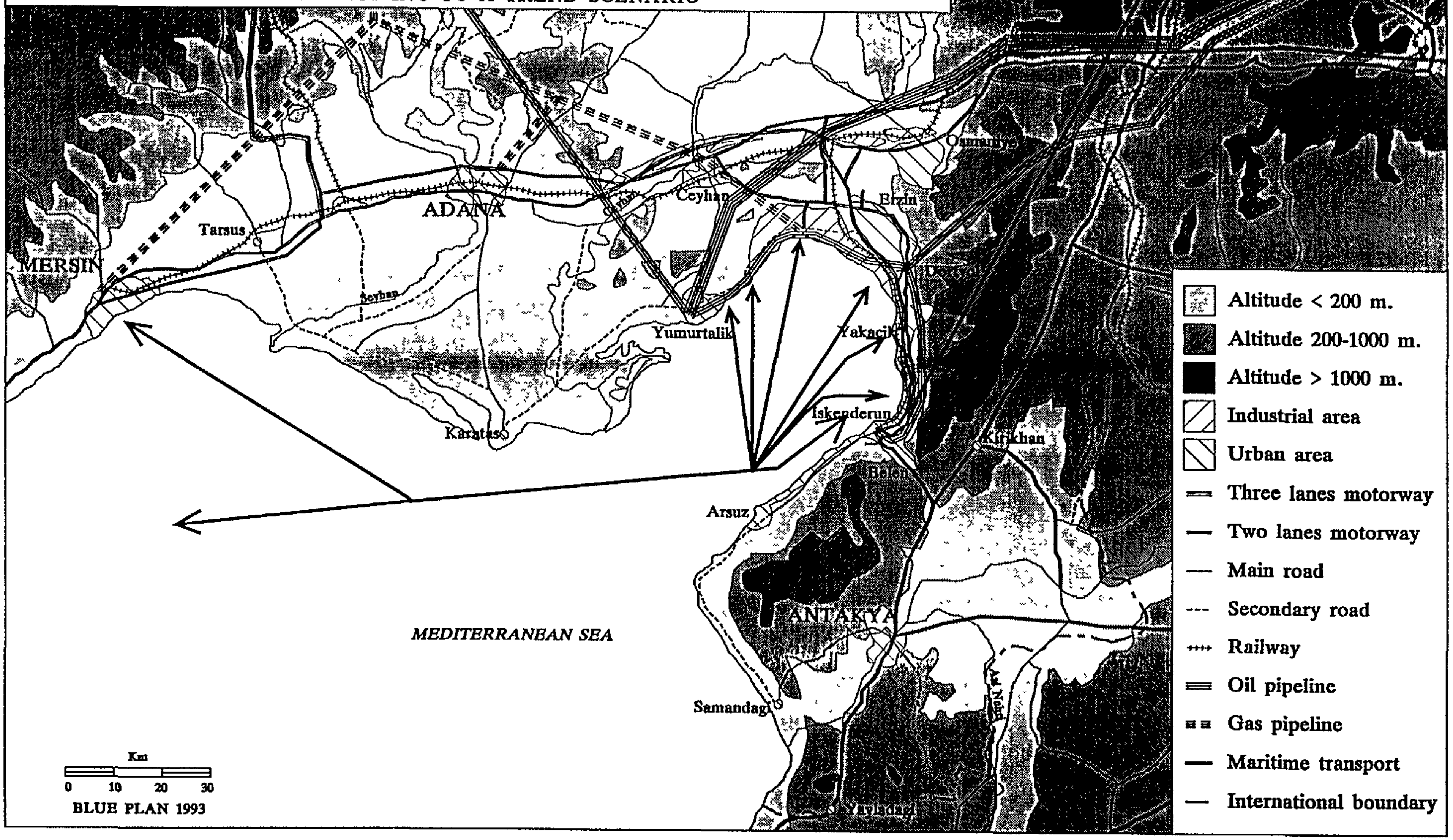


Figure 18. ISKENDERUN BAY
URBANIZATION, INDUSTRIALIZATION, TERRESTRIAL AND MARITIME TRANSPORTS IN 2025 ACCORDING TO A TREND SCENARIO


MERSIN
Tarsus
ADANA
Seyhan
Ceyhan
Karatas
Yumurtalik
Yakacik
Iskenderun
Erzin
Osmaniye
Dortyol
Kirikhan
Belen
Arsuz
ANTAKYA
Samandagi
Asi Nehri
Yayladagi
MEDITERRANEAN SEA
Km
0 10 20 30
BLUE PLAN 1993
Altitude < 200 m.
Altitude 200-1000 m.
Altitude > 1000 m.
Industrial area
Urban area
Three lanes motorway
Two lanes motorway
Main road
Secondary road
Railway
Oil pipeline
Gas pipeline
Maritime transport
International boundary

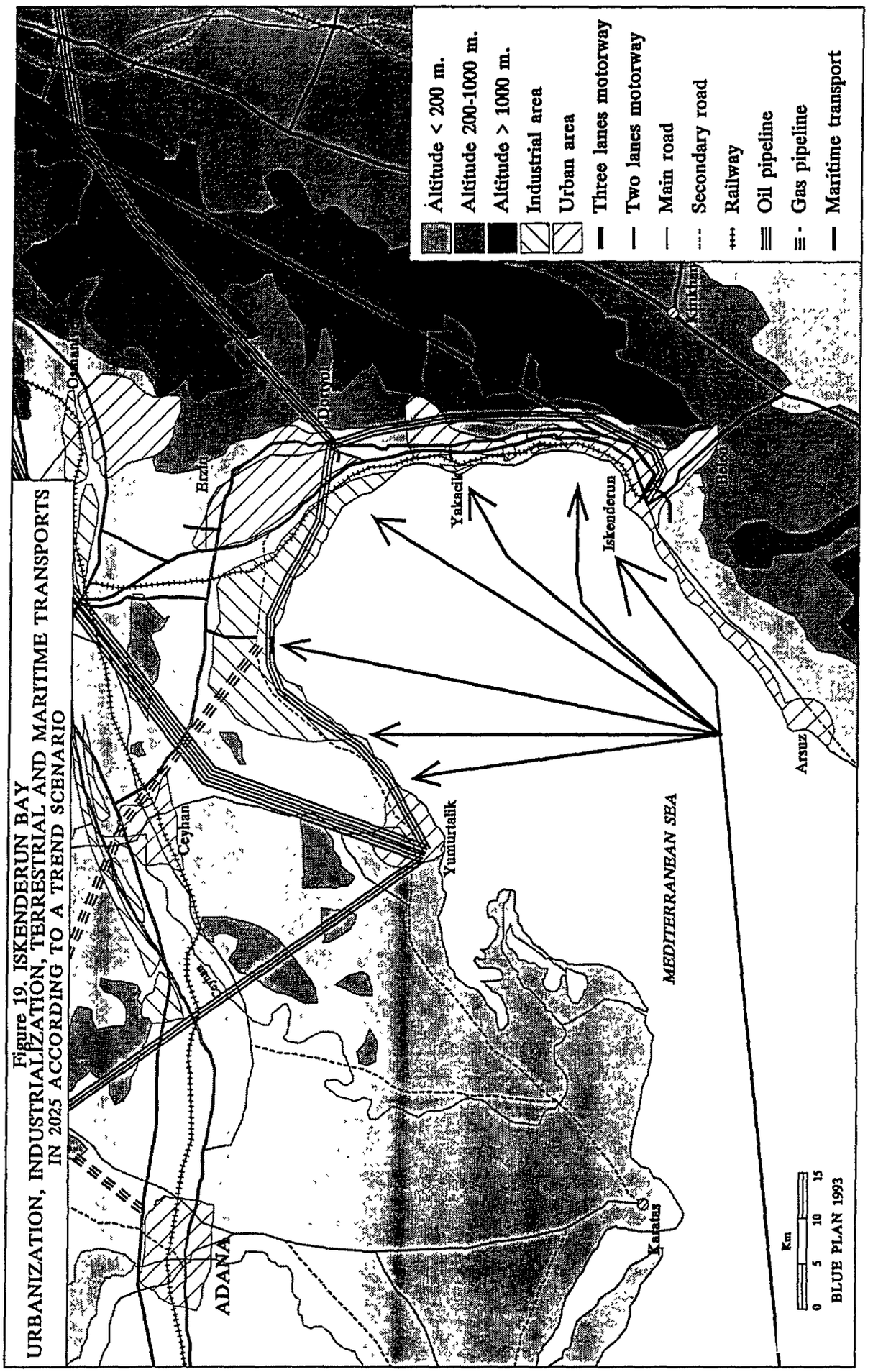


Figure 19. ISKENDERUN BAY
URBANIZATION, INDUSTRIALIZATION, TERRESTRIAL AND MARITIME TRANSPORTS
IN 2025 ACCORDING TO A TREND SCENARIO
Altitude < 200 m.
Altitude 200-1000 m.
Altitude > 1000 m.
Industrial area
Urban area
Three lanes motorway
Two lanes motorway
Main road
Secondary road
Railway
Oil pipeline
Gas pipeline
Maritime transport
Osmaniye
Erzin
Dortyol
Kirikhan
Yakacik
Iskenderun
Belen
Ceyhan
Yumurtalik
MEDITERRANEAN SEA
Arsuz
Karatas
ADANA
Km
0 5 10 15
BLUE PLAN 1993

for immediate profits in a fiercely competitive context, by a poor and incoherent space management strategy. Overall, the conditions are favourable to a two-speed form of development, in which some areas will suffer from economic slumps or stagnation while other more densely populated areas will prosper.

The almost continuous urban and industrial development of the area between Yumurtalik and Iskenderun is shown in Figure 19, highlighting considerable development communication means, further increased by the traffic requirements along the Samsum/Iskenderun axis. Industrial development primarily expands on agricultural land, surrounding the free zone of the bay and coasts, because of the low prices of land and direct access to the sea (docks, waste). Tourism is responsible for the continuous urbanisation of the area between Iskenderun and Arsuz, on sites classified as "touristic development zones" by the Ministry of Tourism, in contradiction with the Ministry of Agriculture's recommendations for land protection and under its responsibility. Growth around the urban communities corresponds to the lack of coherence at the national and local levels in terms of spatial management and inobservance of environmental consideration (landscapes, quality of life and environment).

The trend scenario illustrates bay pollution in 2025, on the basis of domestic discharge of the used district waters (Figure 20 and Table 16). Calculated on the basis of urbanisation rates, these direct discharges into the sea follow the same lines as the hypotheses regarding the consideration of the environment in the scenario. According to the same principle, we have imagined that sea pollution from plastics could not be corrected via this scenario (implementation too expensive, inoperative fines and/or lack of authority, lack of real awareness of all actors, etc.). Figure 21 is an extrapolated version of Figure 14: each box was allotted the value of the immediately higher concentration.

4.3. Conflicts and potential risks

Figure 22 presents the catalogue of conflicts and potential risks, inherent to the trend scenario. Urban and industrial development are represented by the drawing. The transportation factor has been alleviated to enhance readability. Sea-turtle beaches and avifauna sites were superimposed.

Three types of conflicts stand out:

- conflicts between the economic activities involving the use of natural resources (water, soil). This is the case in the Eastern plain, where urban and industrial development, agriculture, transportation and tourism are competitors in terms of land use and water requirements.
- conflicts between one or several economic activities and the protection of natural resources in the wide sense of the term (including wild fauna and flora). This is the case in the lagoons of Yumurtalik as a result of intensified agricultural activities which are destroying the balance of natural environment. This is also true for sea-turtle beaches and avifauna sites, where the need for leisure activities of the population in the neighbouring cities of Adana and Antakya induces uncontrolled and disruptive tourism. Growing cities and industry also entail taking building material from the beaches which then run the risk of being deserted by the turtles.

Figure 20. ISKENDERUN BAY
ESTIMATION OF DOMESTIC WATER CONSUMPTION AND DOMESTIC LIQUID WASTES
IN 2025 ACCORDING TO A TREND SCENARIO

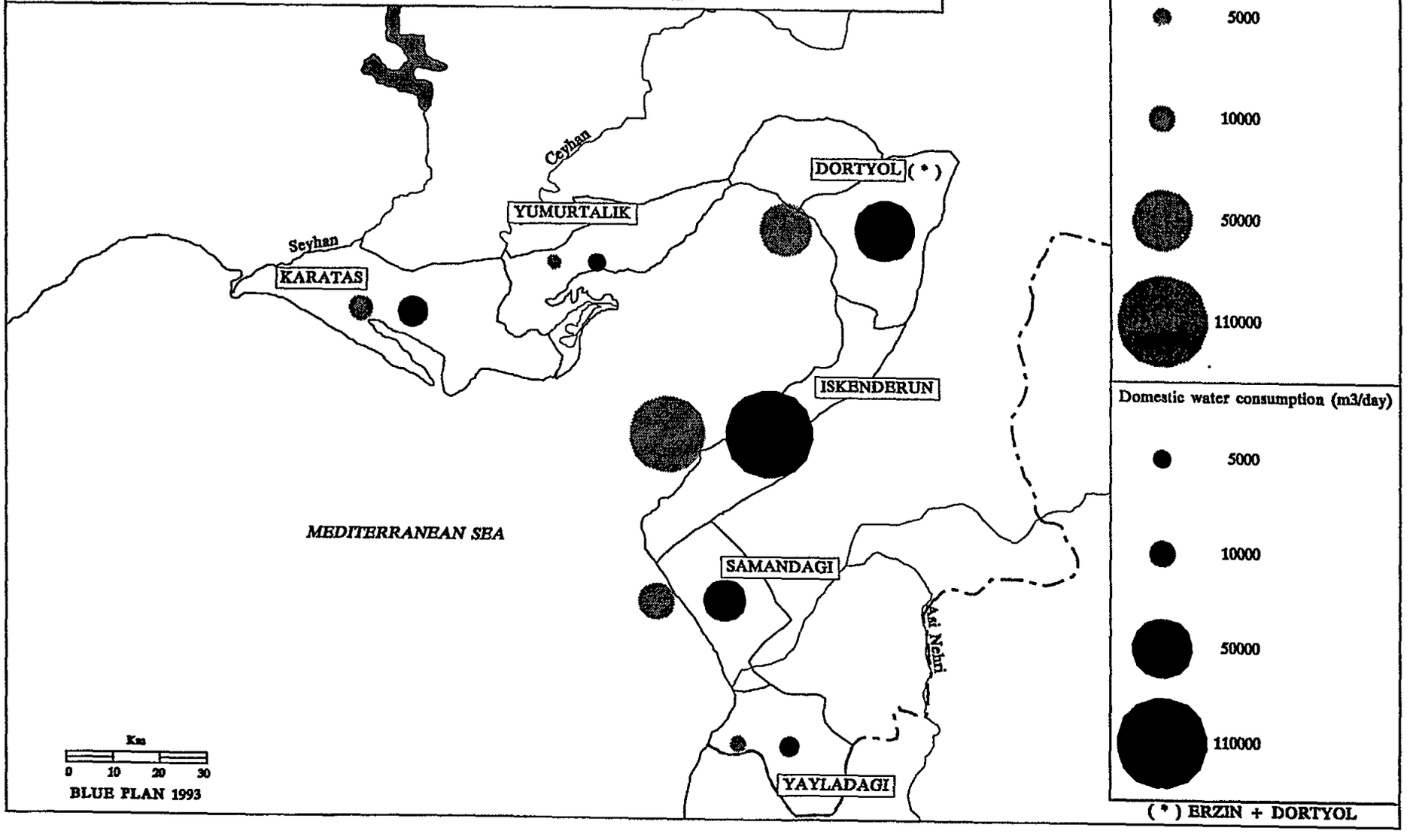


Table 16 : ESTIMATES OF THE WATER CONSUMPTION AND DOMESTIC WASTES IN THE COASTAL DISTRICTS OF ISKENDERUN BAY IN 2

1985 DATA			
	Total Population (inhab)	Urban Population (inhab)	Urban Rate %
KARATAS	53 942	8 101	15%
YUMURTALIK	30 610	13 946	46%
DORTYOL	144 942	34 819	24%
ISKENDERUN	273 705	173 607	63%
SAMANDAGI	82 656	27 264	33%
YAYLADAGI	26 514	6 422	24%
TOTAL	612 369	264 159	43%

HYPOTHESES FOR 2025						
	Total Population (inhab)	Urban Rate %	Water consumption per inhabitant (litre per day)		Wastes ratio (% of the consumption)	
			Urban	Rural	Urban	Rural
KARATAS	83 717	35%	225	115	75	65
YUMURTALIK	25 530	55%	225	115	75	65
DORTYOL	285 852	60%	225	115	75	65
ISKENDERUN	531 987	80%	225	115	75	65
SAMANDAGI	149 679	55%	225	115	75	65
YAYLADAGI	34 970	40%	225	115	75	65
TOTAL	1 111 735	66%	225	115	75	65

2025 RESULTS								
	Water consumption per inhabitant (litre per day)	Water consumption (m3 per day)			Mean wastes ratio (% of the consumption)	Domestic wastes (m3 per day)		
		Urban	Rural	Total		Urban	Rural	Total
KARATAS	154	6 593	6 258	12 851	70	4 945	4 068	9 012
YUMURTALIK	176	3 159	1 321	4 481	72	2 370	859	3 228
DORTYOL	181	38 590	13 149	51 739	72	28 943	8 547	37 489
ISKENDERUN	203	95 758	12 236	107 993	74	71 818	7 953	79 771
SAMANDAGI	176	18 523	7 746	26 269	72	13 892	5 035	18 927
YAYLADAGI	159	3 147	2 413	5 560	71	2 360	1 568	3 929
TOTAL	188	165 093	43 469	208 893	73	124 327	28 030	152 357

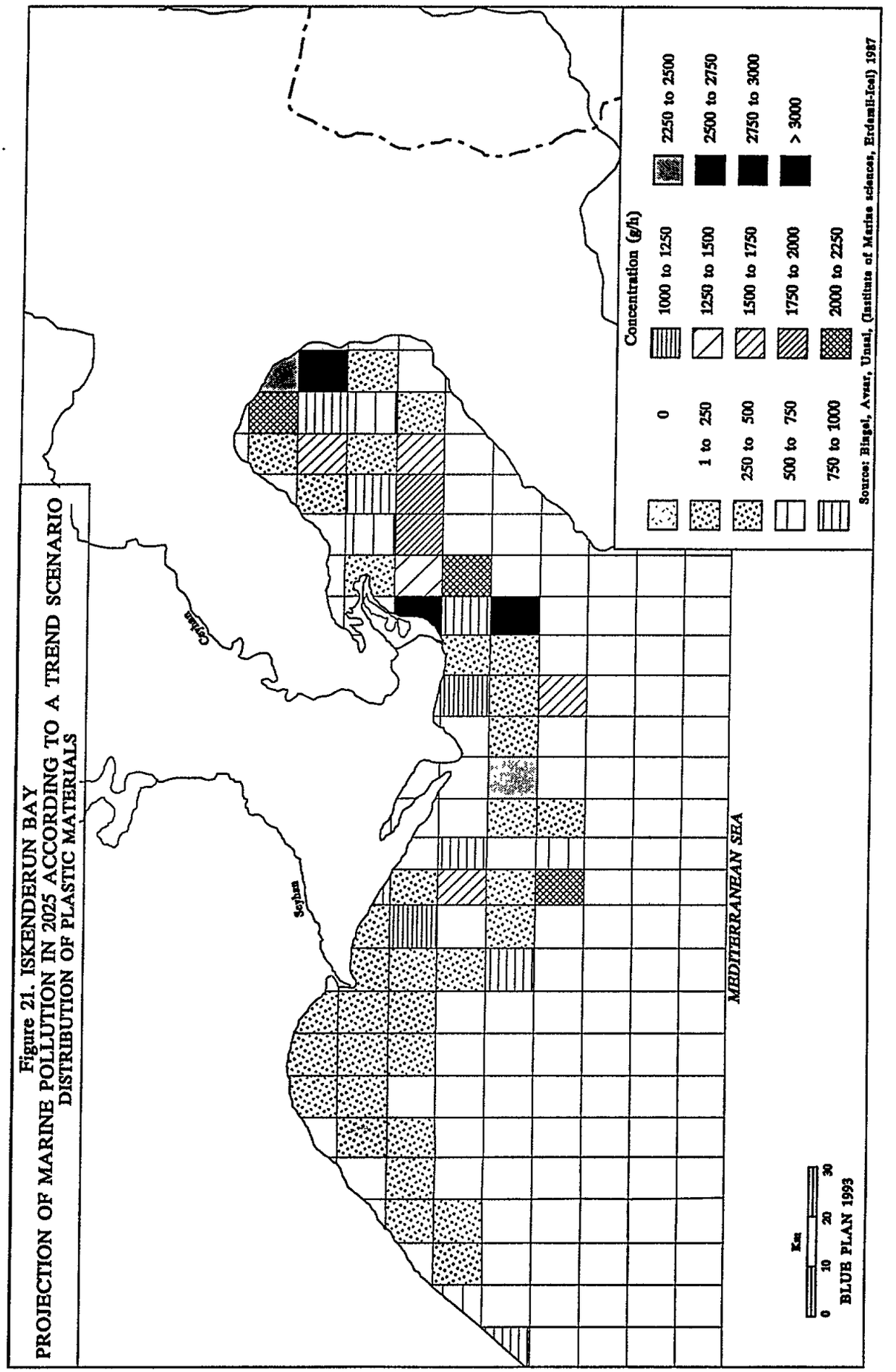
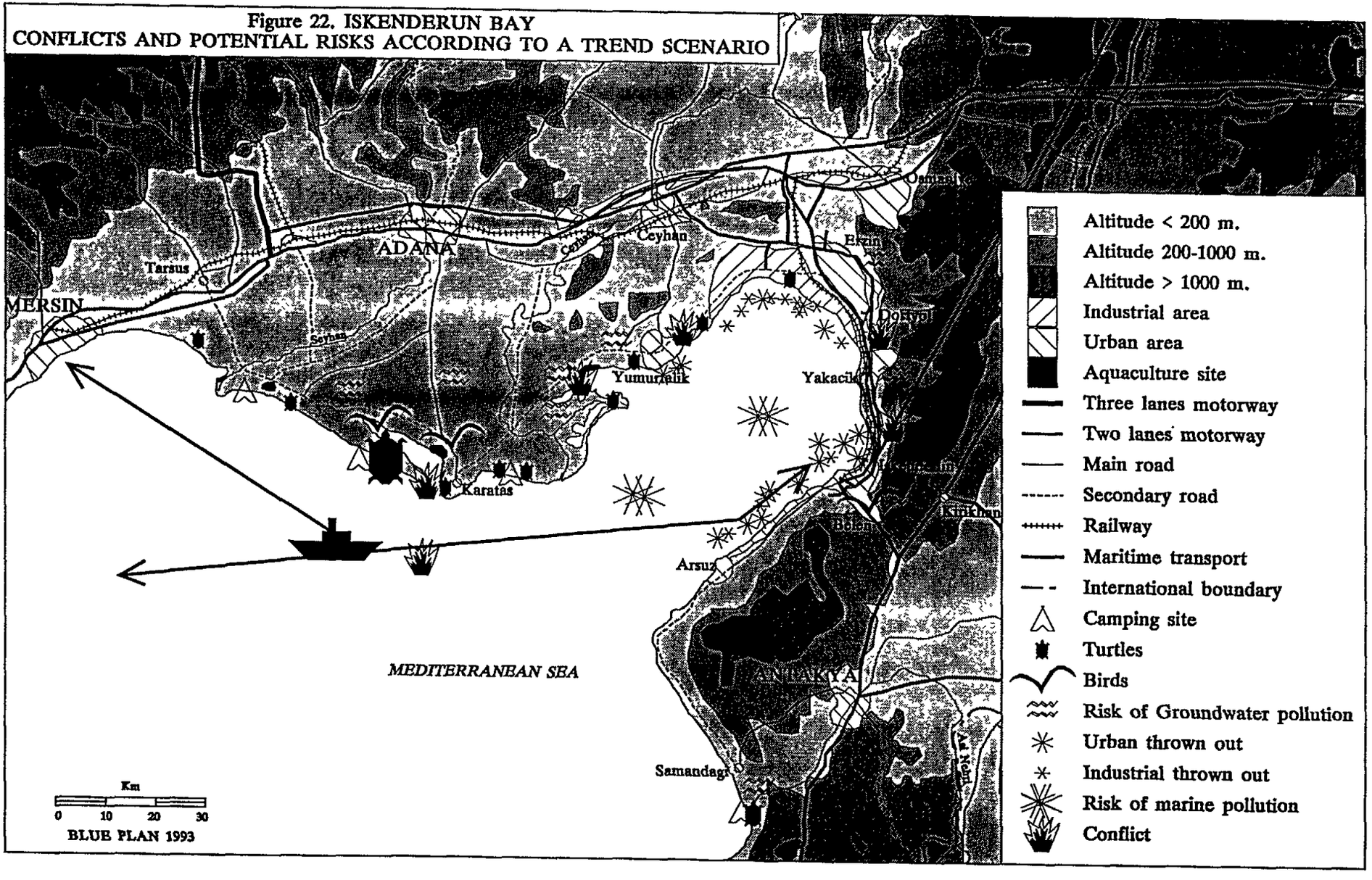


Figure 21. ISKENDERUN BAY
PROJECTION OF MARINE POLLUTION IN 2025 ACCORDING TO A TREND SCENARIO
DISTRIBUTION OF PLASTIC MATERIALS

Figure 22. ISKENDERUN BAY
CONFLICTS AND POTENTIAL RISKS ACCORDING TO A TREND SCENARIO



- conflicts stemming from competition within one activity, creating waste, redundancy of equipment and various overbids. This will be the case for the area between Mersin and Iskenderun in 2025, according to the trend scenario.

Potential risks involve degradation, and sometimes irreversible destruction, of natural resources caused either by disasters or more insidiously by abusive use of one resource or medium.

The first risk in Iskenderun Bay is associated with the intense oil traffic. Recent events demonstrate what a severe problem accidental black tides can be. The trend scenario reveals another source of degradation of the marine environment: multiplied urban and industrial waste, which is poorly and inefficiently managed.

On land, two natural resources are degraded, if not lost forever. These are the agricultural soil, nibbled away by concurrent activities (urban and industrial development, transportation, tourism). The resources in fresh water and more specifically groundwaters are also affected by many forms of aggression, but their cumulated effects are not considered. These degradations usually stem from pumping operations for irrigation purposes with the risk of increasing salinity in the nearby sea (a real quantitative evaluation of the risk can be carried out by using hydrogeological simulation models, with a high performance ratio, but it is expensive). Furthermore, groundwaters are vulnerable to pollution through infiltration and leaching (uncontrolled discharge of used water, fertilisers and pesticides). As a consequence, a shortage in good quality fresh water appears over the considered period.

At the end of our trend scenario's exploration of the future of Iskenderun Bay, which can represent an undesirable image for the region, we have delimited two types of areas, according to different problematics. (Figure 23).

Two areas, corresponding to the less economically and demographically dynamic zones of the delta and Southern area, raise problems both in terms of protection and development incentives. The other area, corresponding to the zone from Yumurtalik to Arsuz, raises issues on the fight against pollution on balanced development and management.

These images served as basis for the construction of the alternative scenario for Iskenderun Bay in 2025. We must remember that the Development/Environment issue aims at the optimal use of natural resources, without negative impact upon development. This signifies, among other things, that Man and the satisfaction of his needs are at the centre of the reflexion work and that it is not in any way possible to stunt the dynamics of growth.

4.4. Prospective images for Iskenderun Bay in 2025 according to an alternative scenario

Figure 24 shows the alternative image for the zone from Yumurtalik to Arsuz. Several clear premises have been determined: inland planning, setting up "green buffer zones" along the coasts, integral protection of several refuge-sites for fauna and flora (for which a form of management must still be selected, but could entail using the notion of appropriation by usage), rational use of infrastructures and equipment, controlled urbanisation, spatial savings and ensured implementation of primary equipment (water, sewage, etc.) on a par with urban growth.

Figure 23. ISKENDERUN BAY
SITUATION IN 2025 ACCORDING TO A TREND SCENARIO : AREAS TO PROTECT / TO PLAN

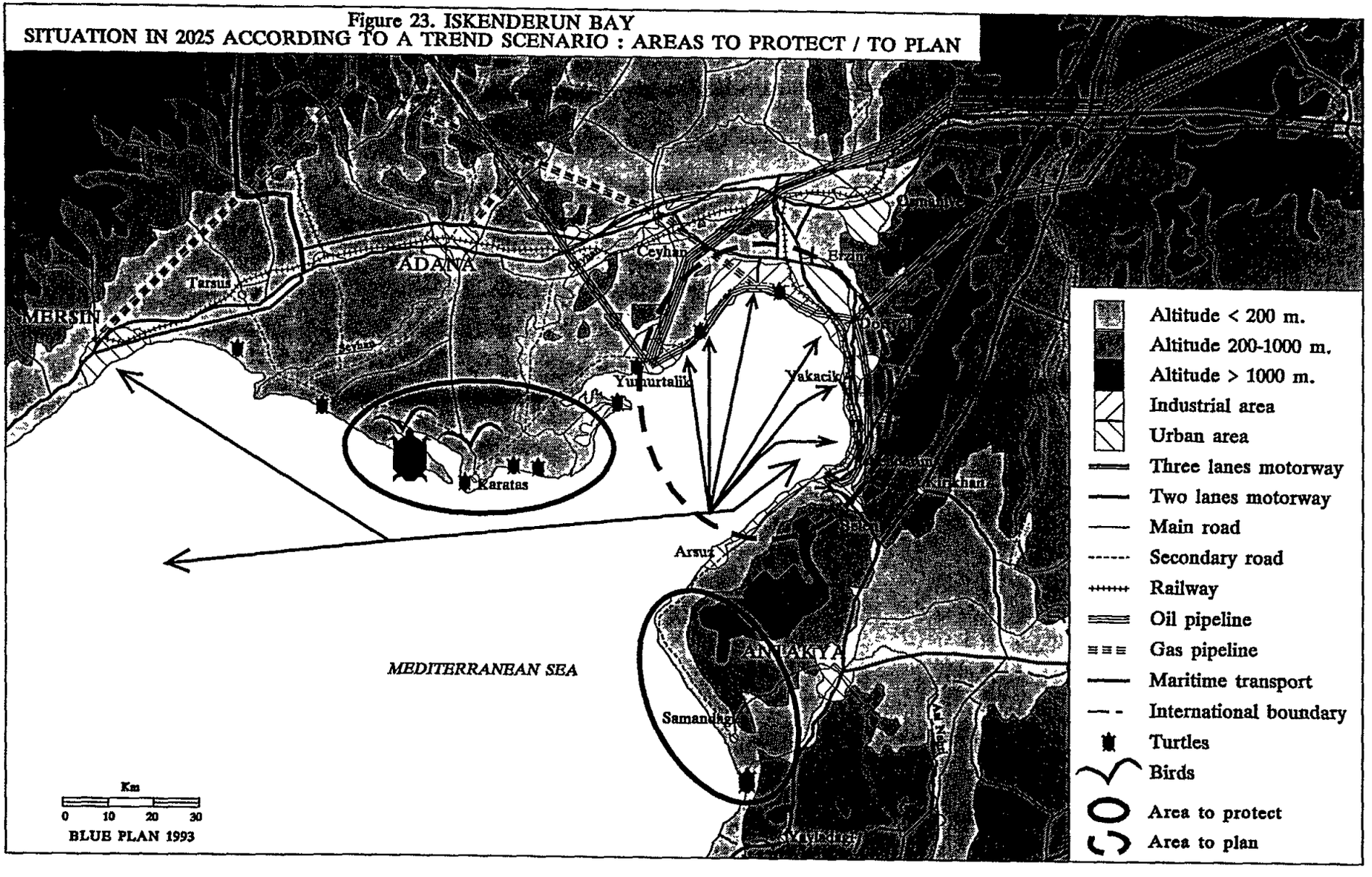
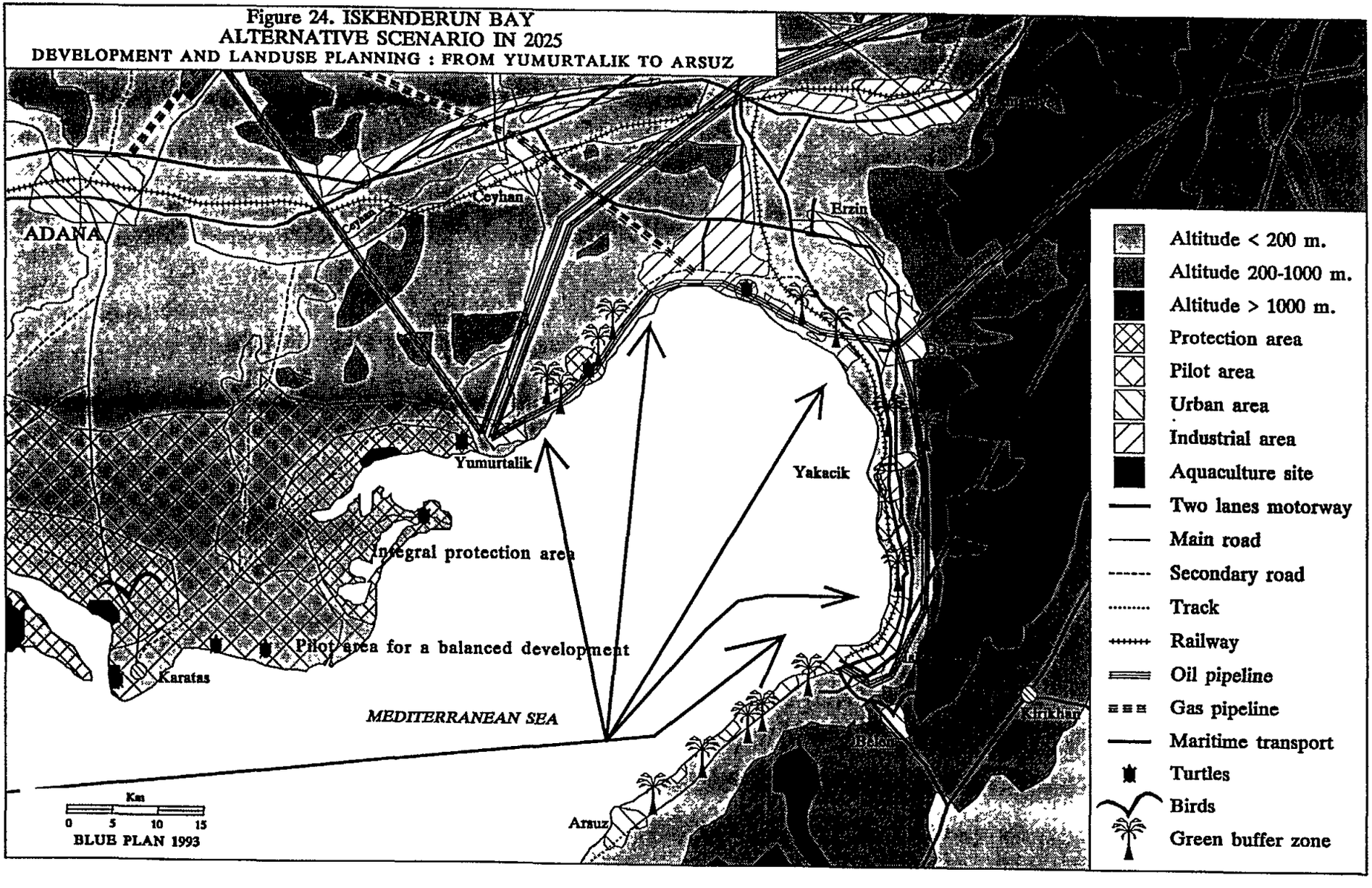


Figure 24. ISKENDERUN BAY
ALTERNATIVE SCENARIO IN 2025
DEVELOPMENT AND LANDUSE PLANNING : FROM YUMURTALIK TO ARSUZ



The figure can not cover everything, but it represents reduced industrial zones along the coasts, which have been shifted near the communication routes, green buffer zones to avoid uninterrupted urbanisation and allow ongoing agricultural activities, the reduction of the number of loading/unloading zones based on improved use of existing facilities, more highly-individualised and structured urban areas (it is up to town planners to think on the implementation means: new towns ? increased density ?), small protected zones near industrial areas, letting the specialists in economics and sociology decide which innovative and efficient management tools should be used. The land transportation network is the same as in the trend scenario: geographical constraints and regional vocation justify this hypothesis.

The two other images of the alternative scenario (Figures 25 and 26) involve the delta and Southern areas (called the "high cornice of Amanos"). Both zones are part of a program for protection of the environment and balanced development around traditional activities (not necessarily extensive considering the agricultural and aquacultural potential) and new and innovative activities (education and research in association with the University of Adana and Hatay by 2025, green tourism for the neighbouring urban populations, biological agriculture).

Spatial organisation of these zones will revolve around a hard core of integral protection involving sea-turtle beaches and avifauna sites. Around this core expands the pilote area where the existing economic activities (mainly fishing and agriculture) are encouraged and must follow strict anti-pollution standards (rational use of inputs). As opposed to the situation in the Yumurtalik-Arsuz zone, transportation networks are different from those of the trend scenario. The main coastal roads are considered as tracks: the long-term impacts of such coastal roads (encroachment, sparse urbanisation) are too well-known to be ignored. On the other hand, links between major cities in the districts and the neighbouring city (i.e. Adana-Karatas, Antakya-Samandagi, Antakya-Yaladagi) are undergoing the same expansion as in the trend scenario: this a condition for development that can not be suppressed.

Overall, the alternative scenario image of Iskenderun Bay by 2025 (Figure 27) reveals a pole of urban and industrial development surrounded by two zones of agricultural and touristic development, the coasts of which we certainly hope will remain the egg-laying grounds of the sea-turtles.

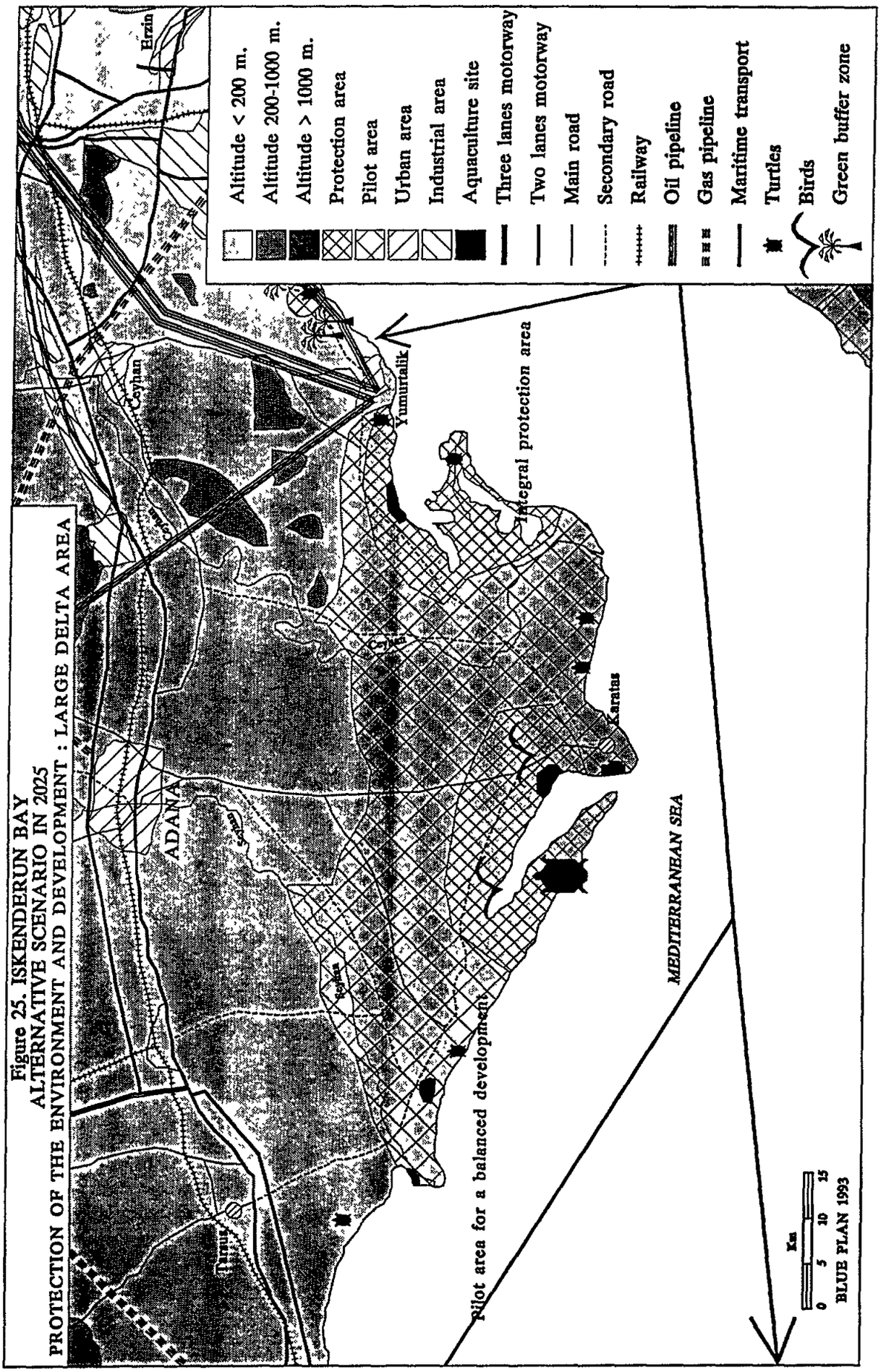


Figure 25. ISKENDERUN BAY
ALTERNATIVE SCENARIO IN 2025
PROTECTION OF THE ENVIRONMENT AND DEVELOPMENT : LARGE DELTA AREA
Altitude < 200 m.
Altitude 200-1000 m.
Altitude > 1000 m.
Protection area
Pilot area
Urban area
Industrial area
Aquaculture site
Three lanes motorway
Two lanes motorway
Main road
Secondary road
Railway
Oil pipeline
Gas pipeline
Maritime transport
Turtles
Birds
Green buffer zone
Erzin
Ceyhan
Yumurtalik
Integral protection area
ADANA
Karatas
MEDITERRANEAN SEA
Pilot area for a balanced development
Km
0 5 10 15
BLUE PLAN 1993

Figure 26. ISKENDERUN BAY
ALTERNATIVE SCENARIO IN 2025
PROTECTION OF THE ENVIRONMENT AND DEVELOPMENT : AMANOS CORNICE AREA

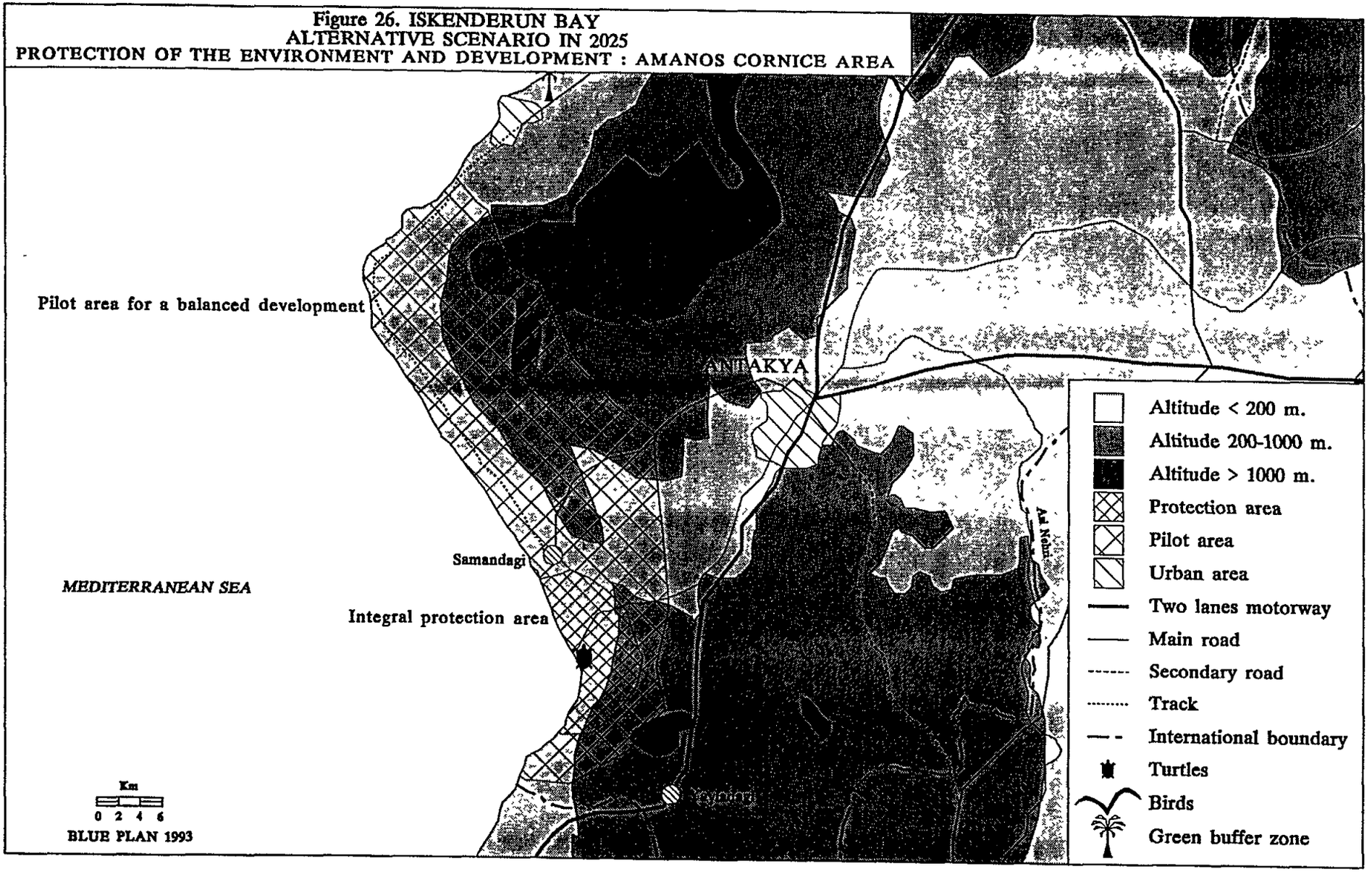
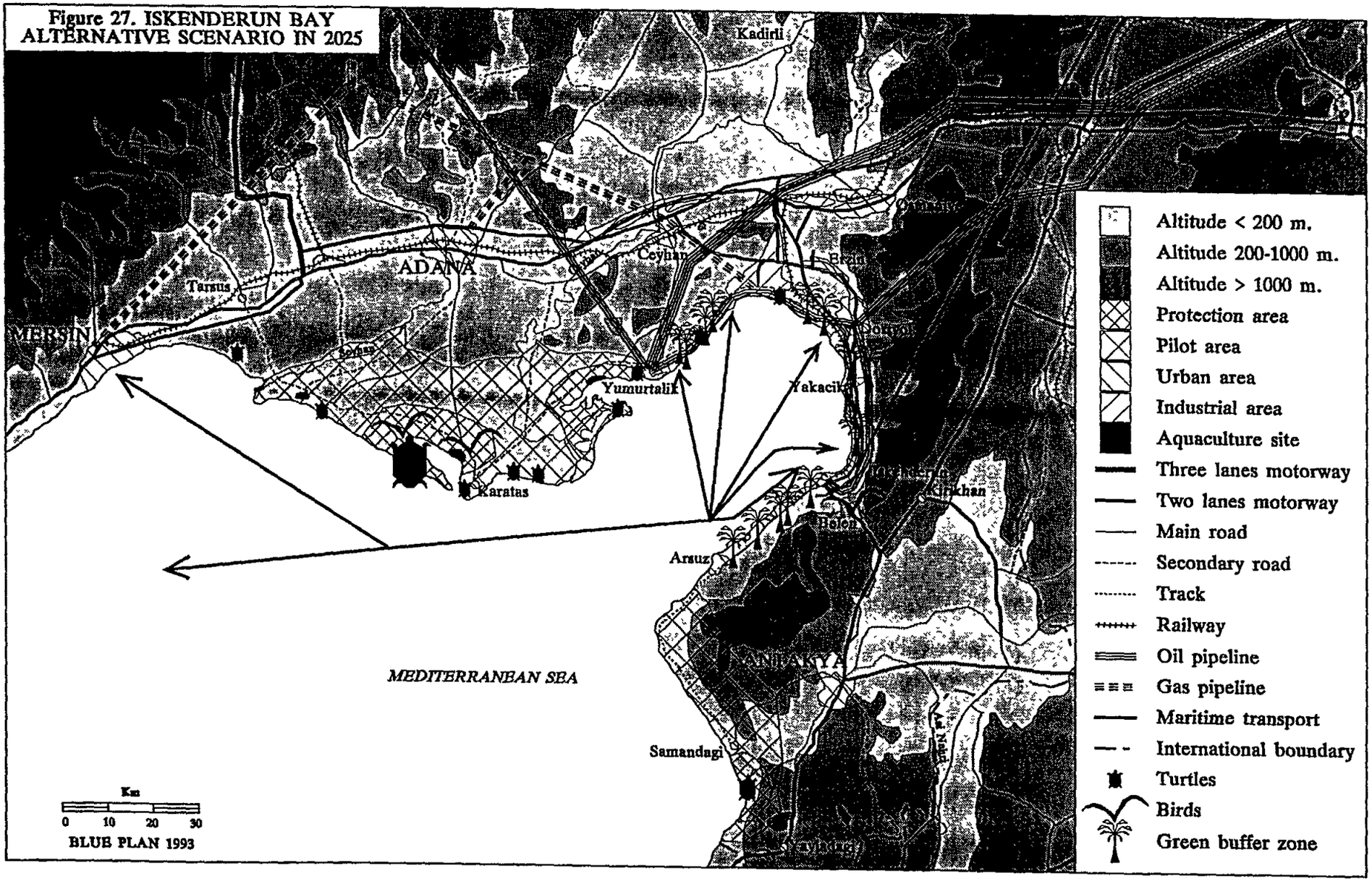


Figure 27. ISKENDERUN BAY ALTERNATIVE SCENARIO IN 2025



5. CONCLUSIONS

At the end of the systemic and prospective study of Iskenderun Bay, several observations can be underlined.

The experience was very stimulating through the intellectual challenge it represented.

Regarding the implementation of systemic and prospective methodology to a small coastal zone, the Iskenderun Project greatly enriched the Blue Plan's experience. Lessons learnt will be used again, after more thorough analysis, in other similar projects around the Mediterranean.

In this sense, it is important to stress that:

- the final objective of such a study must be very clearly determined in order to propose the most appropriate tools.
- identification and allotment of tasks, as well as the evaluation of related means (labour, techniques and finance) must be dealt with at the beginning of the study. It would be more realistic to check them at every stage.
- during the systemic and prospective reflexion stage, a reference database on the region involved must be created and jointly compiled.
- the Blue Plan's role must be clearly defined from the start, at the same time as the task of the local team.

As regards the future of Iskenderun Bay, the study has brought many positive answers, such as:

- enlightening the long-term risks of degradation or even destruction facing the natural resources and environment,
- identification of the conflicts between economic activities and resources, as well as within and between institutions,
- the will of many actors to find original and innovative solutions,
- awareness of interdependence, complicating the search for optimal solutions to the issues,
- initiation of a collective reflexion process on the future of the bay,
- emergence of the need for an original long-term environment management structure.

Finally, during the entire study, many similarities became apparent between the problematic involving Iskenderun Bay and the region of Marseille-Fos-Camargue, where urban, industrial and harbour zones co-exist with protected areas[10].

Prospective has once again proven its powers of mobilisation, which is in itself an encouragement to follow the same trail, while unceasingly improving the tool. To enhance its operational efficacy, the Blue Plan should use "prospective modules", easier to implement, and acting as support for decision-making within the context of long-term Development/Environment. Modules could be developed for the game of the actors, the identification of processes, conflicts, risks, etc. In this respect, the "Manual of Prospective" that the Blue Plan is presently preparing will draw upon the experience gained from the Iskenderun Project.

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[10] These similarities should encourage the actors in both regions to establish mutually profitable relationships and exchanges.

APPENDIX 1

Blue Plan Team and experts
List of missions and meetings

1. BLUE PLAN TEAM AND EXPERTS

- Elisabeth Coudert, Blue Plan, Consultant
- Jean-Pierre Giraud, Blue Plan, Computer officer
- Jacques Giri, Director General strategy, Energy, Environment, Development (SEED), Consultant
- Bernard Glass, Blue Plan/RAC Director
- Philippe Gourmain, Engineer-student Agronomy
- Michel Grenon, Scientific advisor, Blue Plan
- Arab Hoballah, Economist-Planner, Deputy Director Blue Plan/RAC
- Jacques Royer, Professor Geneva University (CUEPE), Consultant
- Alexandra Sevlian, Student then Consultant Geographic Information/Planning

2. LIST OF MISSIONS AND MEETINGS RELATED TO THE ISKENDERUN PROJECT

- February 27 to March 2, 1990: mission to Ankara and Iskenderun (B. Glass and M. Grenon).
- June 18 and 19, 1990: meeting in Sophia Antipolis with N. Algan, C. Aruoba and C. Hamamci.
- November 12 to 19, 1990: mission to Ankara and Iskenderun (J. Giri and J. Royer).
- April 10 and 11, 1990: meeting in Sophia Antipolis of the Work Group for the Orientation of Blue Plan Activities, with the participation of C. Hamamci.
- January 12 to 17, 1992: mission to Ankara and Iskenderun (E. Coudert and M. Grenon).
- June 17 to 24, 1992: mission to Ankara (E. Coudert, M. Grenon and J. Royer).
- September 28 and 29, 1992: meeting in Sophia Antipolis with C. Aruoba and C. Hamamci.
- November 21 to 27, 1992: mission to Ankara (E. Coudert, M. Grenon and A. Hoballah).

APPENDIX 2

List of documents related to Iskenderun Project

LIST OF DOCUMENTS RELATED TO ISKENDERUN PROJECT

CAR/PB, février 1990.
Projet ISEKENDERUN : Première analyse.

CAR/PB, mars 1990.
Compte-rendu de mission en TURQUIE (27 février-2 mars 1990), B. GLASS, M. GRENON.

CAR/PB, 30 mai 1990.
Document de travail pour la réunion des 18 et 19 juin 1990, Sophia-Antipolis.

CAR/PB, 2 juillet 1990.
Projet ISKENDERUN : Compte-rendu de la réunion des 18 et 19 juin 1990, Sophia-Antipolis.

Prof. C. ARUOBA.
General outlook of the Turkish economic scene, October 1990 (document interne).

Prof. J. ROYER.
ISKENDERUN Project : Suggestions for a Social Accounting Matrix, october 1990.

M. J. GIRI.
Eléments pour la préparation de la prospective industrielle de la région d'ISKENDERUN, octobre 1990.

Prof. J. ROYER.
Projet ISKENDERUN : compte-rendu de mission (12-19 novembre 1990).

M. J. GIRI.
Note sur la préparation de la prospective du développement industriel autour de la baie d'ISKENDERUN, 19 novembre 1990.

Faculté des Sciences Politiques de l'Université d'ANKARA.
Projet Directeur sur le constat de la pollution de la baie d'ISKENDERUN : pour une planification socio-économique intégrée. Première étape (juin 1990 - décembre 1990). Traduction française : B. et C. KUZUCUOGLU.

ANKARA Univeritesi Siyasal Bilgiler Fakültesi.
Cevre ile uyumlu sosyo-ekonomik entegre planlama için ISKENDERUN körfezi'nde kirlenmenin tespiti ve çevre yönetim projesi. Ikinci asama, ANKARA, aralik 1991. (en turc, résumé en français).

CAR/PB, 28 janvier 1992.
Lignes directrices pour servir à l'élaboration des scénarios Développement/Environnement de la baie d'ISKENDERUN.

CAR/PB, 31 janvier 1992.
Projet ISKENDERUN : compte-rendu de la mission PB en TURQUIE (12-17 janvier 1992).

Prof. C. ARUOBA.
Notes on estimated consequences of some activities for ISKENDERUN bay area, 27 may 1992.

Prof. J. ROYER.
Quelques leçons de la réunion d'ANKARA sur le Projet ISKENDERUN, juin 1992 (document interne).

CAR/PB, 20 juillet 1992.
Projet ISKENDERUN : compte-rendu de la mission PB (17-24 juin 1992).

CAR/PB, 8 octobre 1992.
Projet ISKENDERUN : compte-rendu de la réunion de travail (Sophia-Antipolis, 28-29 septembre 1992).

Prof. J. ROYER.
Quelques réflexions sur les scénarios nationaux de la TURQUIE, novembre 1992.

ANKARA Univeritesi Siyasal Bilgiler Fakültesi.
Cevre ile uyumlu sosyo-ekonomik entegre planlama için ISKENDERUN körfezi'nde kirlenmenin tespiti ve çevre yönetim projesi. Asama ara raporu. Kasim 1992. (en turc, avec un résumé en français du chapitre 3).

CAR/PB, 14 décembre 1992.
Eléments pour le paragraphe "Propositions d'Actions Urgentes" du rapport final du Projet ISKENDERUN.

CAR/PB, 17 décembre 1992.
Projet ISKENDERUN : comte-rendu de la mission PB (21-27 novembre 1992).

ANKARA Univeritesi Siyasal Bilgiler Fakültesi.
Cevre-Kalkinma Baglaminda Zokenderun Korfezi Cevre Yonetini Projesi. Sistemik ve Prospecti/ Bir Cozumleme-Aralik, 1992.

APPENDIX 3

Social Accounting Matrix

Iskenderun Project:
Suggestions for a Social Accounting Matrix

By Prof. J. Royer, Consultant

Introduction: Why a Social Accounting Matrix?

The meeting on the Iskenderun Project held in Sophia-Antipolis in june 1990 assigned two possible tasks to economists:

- to illustrate the major socio-economic flows in a region formed by all administrative units of the Project (hereunder called the *Iskenderun Region*, or simply the *Isk. Region*). This includes the whole chain going from production activities, derived factor payments, transfers to major economic agents (also called Institutions), and finally consumption of such agents. It was also underlined that such tables and analyses should identify the major links of the Isk. Region with other parts of Turkey and the external world.
- to assist in building up scenarios for the Project, and in particular to help in figuring out the future links between levels of activity and income in the Isk. Region with the corresponding levels in the Country as a whole.

The instrument suggested below is a social accounting matrix for Turkey as a whole, meant to identify major flows of the Isk. Region and their relationship to the rest of the Country and to the external world. Section 1 will introduce such a matrix, and assign to it major requirements in relation to the objectives as outlined above. Section 2 will comment on the classifications of Production Activities, of Employment and of Factors Payments (Types U and V Matrices). Section 3 will do the same for Institutions (Type T Matrix). Section 4 will comment on activities (Type V Matrix). A brief conclusion will follow.

Section 1 : A summary presentation of Social Accounting Matrices

The chain of flows outlined above can be presented in simplified matrix form as follows:

	1 Pr. Factors	2 Institutions	3 Sav/Investment	4 Pr. Activities	5 R. of World	6 Total
1-Production Factors	0	0	0	Value-Added	Net F. Payment from Abroad	Factor Income
2-Institutions	Alloc. of Fact. Payments	Transfers	0	0	Net non-factor payment from A.	Income of Inst.
3-Savings/Investment Account	0	Savings	0	0	Bal. of payments Deficit	Total Savings
4-Production Activities	0	Domestic Consumption	Domestic Investment	I/O Table	Exports	Aggregate Demand
5-Rest of World	0	Imported Consumption	Imported Investment	Imported Inputs	0	Total Imports
6-Total	Fact. Income	Inc. of Inst.	Investment	Gross Output	Foreign receipts	-----

The interpretation of this matrix is based on the convention that receipts can be read in rows, and expenditures in columns. Starting with Factor Incomes, row 1 indicates that there are two receipts, i.e. Value-Added of Production Activities and net Factor receipts from Abroad, while column 1 points to the fact that all factor incomes accrue to Institutions, i.e. economic agents who can own property : Firms, Households, Government. In addition to Factor Incomes, the other receipts of Institutions consist of transfers among themselves (e.g. taxes paid to the Government) and net non-factor incomes from Abroad (e.g. transfers from emigrants). Turning to column 2, it can be seen that Institutions spend their income, in addition to transfers, on domestic consumer expenditure and imports. The balance between total income and the above mentioned expenditures is the savings of Institutions (see intersection col 2 / row 3). Next, in row /column 3, is the Savings/ Investment Account. This account (see row 3) receives, beyond the savings of Institutions, which constitute the domestic source of savings, the net savings from abroad, a residual which is ex-post equal to the deficit of the payments balance, also equal to the net capital received from abroad. On the expenditure side (column 3), we will find Investment, broken down into domestic (row 4) and imported (row 5) capital goods. Next, in row /column 4, we find Production Activities. On the receipt side (row 4), we already had consumer and Government expenditure (col 2) and domestic investment (col 3), to which should be added, at the intersection of row and col 4, intermediary inputs, i.e. the Input/Output table, valued at production prices - and in col 5, exports. The expenditure side, i.e. the cost of production activities (column 4) consist of value-added, already seen as being paid to the Factor Income account (row 1), the intermediary inputs (row 4) and finally imported inputs (row 5). All items of row and column 5, i.e. the Foreign account, have been met. A last remark is that, by construction, each total of a row is found to be equal to the related total column; thus, total row 4 is the Aggregate Demand, equal by construction to Gross Output, the total of column 4.

In this brief example, the Social Accounting Matrix (SAM, in short) is nothing else than a matricial presentation of the UN system of national accounts, as strongly influenced by the well known French system. A first original features of a SAM is that, by adopting specific classifications for the first four categories, one may introduce a social bias (e.g. Households can be broken down by income classes), or, if needed, as will be seen below, a regional breakdown. A second feature is that matrices in terms of people, or in physical units, can be fit into the system; for example, an employment account in terms of workers is suggested below, or else tons of pollution emissions can be added. As can be seen in Annexes A, B and C of this paper, two variants of a SAM, called types U and T Matrices, are suggested for this project, as well as a type V matrix for employment.

Before describing these matrices, however, we must address the question : what particular objectives do we have in mind ? A first reply is that we must identify distinct features of the accounts for the Isk. Region, the real problem being the degree of detail required. In order to do so, we will introduce, at least in some of the accounts, a breakdown of the Turkish aggregates into two, namely the Isk. Region on the one side, and the Rest of Turkey on the other. This should enable us to link the

Isk. Region to the Country as a whole, which is our primary objective.

Another is to be able to derive from the SAM a picture of employment in the Isk. Region, as well as figures for labour productivity and wages per capita; this requires the building up of an employment matrix by production activity.

Next, on the social as well as on the economic side, it seems be most useful to see to what extent future development would induce income distribution problems or not. This can be done by identifying small traditional agricultural holdings, as distinct from modern agriculture, as well as other major "traditional" activities in the Isk. Region, for example by separating major "low-productivity" activities in the classification of Production activities which, from what was already said, governs the description of both monetary flows and employment figures. Finally the same objective would require to introduce some classification of households by income class.

The three features suggested above should enable us to obtain, for an appropriate year, a picture of a variety of indicators of the Isk. Region within Turkey as a whole, and to trace up, in the matrix, what are the main channels linking these indicators with national and international features. This will be better understood in the next sections.

Section 2 : Factor Payments, Production Activities and Employment

A short classification of factors contains 4 items: Labour employed, Private Housing, Private Capital and Public Capital. The problem is how to introduce the Isk. Region in the classifications ? Ideally, four links should be identified :

2.1 Economic activities in Turkey generate factor incomes accruing to the Isk. Region, in particular Labour income and gross profits to un-incorporated enterprises.

2.2 Economic activities in Turkey generate employment in the Isk. Region.

2.3 Economic activities located in the Isk. Region generate exports to and imports from the rest of the the World.

2.4 Economic activities located in the Isk. Region use inputs from and supply outputs to activities located elsewhere.

Type U and V Matrices, together with the related list of matrices and classifications (appendix A) suggest a possible compromise. The chief breakdown is that concerning "Labour income in the Isk. Region", which identifies both wage flows and employment figures in the Isk. Region; this is a partial solution to questions 2.1 and 2.2 above, since factors other than labour income in the Isk. Region are not separated from the corresponding Turkish aggregates. A further step in this direction is contained in Appendix C, which suggest a U-1 breakdown of Labour income into 6 categories, i.e.

U-1
1-*Employee* Labour in Iskenderun
2-Self-employed in Iskenderun (own-account workers and employers of un-incorporated enterprises)
3-Oth. employed Labour (incl self-employed *elsewhere*)
4-Private Housing
5-Private *Corporate* Capital
6-Public Corporate Capital

This classification identifies not only wages and salaries in the Isk. Region, but also gross profits of un-incorporated enterprises, a category which include most, if not all traditional enterprises. On the other hand, the "U-1 Factor" classification leaves together profits of corporate enterprises, whether private or public, from the Isk. Region and from elsewhere in Turkey. The same global treatment applies to rents from private housing.

A further progress in identifying monetary flows and employment figures of the Isk. Region can be made by playing around with the classification of activities, as contained, for example, in type V Matrix (see Appendix A). It is suggested in Appendix C to identify in this classification some specific activities in the Isk. Region, e.g. Oil transport in Iskenderun. In the corresponding column, all factor payments generated by such activities would be identified.

Section 3 : Institutional Receipts and Expenditures

Ideally, one may identify all incomes accruing to Institutions located in the Isk. Region, whether Firms, Households or Government. In practice, Type T Matrix (see Appendix B) suggests to separate out households and Governments (i.e. all local Governments) located in that Region, but not firms. Combining the U-1 and the T Matrices, this will permit to identify the following flows :

3.1 In the Factor Income column, income accruing to Isk. households from wages and gross profits of un-incorporated enterprises anywhere.

3.2 In the Institutions columns, transfers accruing to the same from firms anywhere, from households outside Isk.,from the Isk. Government, from the central and other governments.

3.3 In the Rest of the world column, net transfer payments accruing to the same from abroad (e.g. transfers from emigrants to Isk. households).

3.4 In the Isk. households column, expenditures incurred by the Isk. households from the wages of domestic servants (Factors row), transfers to other households, indirect and direct taxes paid to local Government, taxes paid to other Governments (Institutions rows), savings (sav/investment row), domestic consumption (by activity, see section 4), and finally imported consumption and net external payments.

3.5 In the Isk. Government row and column, all receipts and expenditures of local Governments, including transfers from and to the central Government.

In short, Type T Matrix allows comparisons between the structures of receipts and expenditures of Iskenderun- and other households, and that of Iskenderun- and other Governments. A further distinction suggested in Appendix C would consist in splitting the Isk. households row and column using a social criterion, e.g. by income classes (this can only be made if an appropriate household survey is available). The advantage would be to improve our understanding of the possible impact on income distribution of development policies as simulated in future scenarios.

Section 4: Activities

The classification issue for activities has already been dealt with

in section 2 below. The purpose of this section is to extend a little on the configuration of the Activities row, which is nothing else than the core of an Inter-Industry table. To note that all figures of that row are domestic flows valued at production prices, i.e. excluding indirect taxes. Moreover, if "transport and trade" is identified as one activity, all other flows exclude the trade and transport margins.

Starting with the I/O table, at the intersection of the row with the activity column, one will find the traditional "commodity by commodity" table, to be built-up from available sources, including, if needed, industry by commodity tables. The relative easiness of the operation will depend, of course, of the degree of disaggregation of available I/O tables in Turkey. Indeed, the number of Isk. activities proper to be created has been purposely restricted in section 2 above, so as not to add to the difficulty. In any case, the whole row is to be up-dated, with reference to the available base year of I/O table, using the RAS method, an exercise which requires a good deal of attention.

Government expenditures (whether local or otherwise) and exports by commodity do not raise theoretical difficulties, even if computations are likely to be tedious.

On the other hand, households expenditures by commodity are not that easy to build up, and and yet this is supposed to be done, in the T classification, both for Isk. households and other households. The only possible source is the results of household surveys on expenditures. The difficulty is minimized if original data are available on a magnetic tape, and if time is sufficient to re-classify expenditures, but in any case the problem of separating the import and tax contents arises. Let us see the successive steps required on the assumption that only aggregate results are available. In this case, expenditures are generally classified by function, i.e. food, clothing, heating and lighting, etc. One needs to express such data in terms of commodity, excluding the import content. Hence the need for a conversion matrix of the following type :

Conversion matrix for consumer expenditure

Expenditures	activity 1	activity 2	activity 3	...	Tax content	Import content
1-Food	x	x	0	0	x	x
2-clothing	x	0	x	0	x	x
3-Heating & lighting etc	x	0	x	0	x	x

Section 5 : Conclusion

If anything, this note should convey the impression that the building up of a SAM is no small untertaking. A good deal depends, in practice, of the available sources. At this concluding stage, a few remarks are in order :

- The matrix form requires a number of disaggregations, some of which is inevitably not available in an adequate form.

- The main sources are the national accounts, the I/O table and Household surveys on employment, expenditure, etc. The latter are essentially required for the Isk. Region.

- The matrix form facilitates and implies the cross-checking of various sources against each other : the I/O table versus national accounts, consumer expenditures versus national accounts, etc. This is the essence of the method.

- The terminology used in this note is extracted from the book :

« Graham Pyatt, Alan R. Roe and Associates, "Social Accounting for Development Planning, with special reference to Sri Lanka", Cambridge University Press, Cambridge, 1977 »

- The foreword of that book, by R. Stone, includes interesting developments on the problem of adjusting figures with unknown errors.

All in all, the end-purpose of the exercise should be kept in mind when economists and statisticians try to solve the painful exercise of reconciling human resources and time available for this work with ideal requirements. In a first stage, figures relating to the Isk. Region should deserve priority. The framework outlined in this note, or another general framework should primarily serve the purpose of introducing rules in the classifications to be used, and in assigning priority tasks. If, unluckily, the building up of a complete SAM appeared to be an impossible task, it should be remembered that the final aim is to permit to make an economic analysis, itself aimed at facilitating the next stage of scenario building.

"U" List of Matrices and Classifications
(Description of Rows = Receipts)

1 - Production Factors : Isk Labour
U1.4 : Wages of Domestic Servants living in Iskenderun
U1.5 : Wages of Civil Servants living in Iskenderun
U1.7 : Wages & Salaries paid to Isk. employed labour
U1.8 : Net Factor Payments to Isk. Labour from Rest of World

2 - Production Factors : Other Factors
U2.4 : Wages of Domestic Servants Outside Iskenderun
U2.5 : Wages of Civil Servants Outside Iskenderun
U2.7 : Value-Added of Pr. Activities except Isk. Employed Labour
U2.8 : Other Net Factor Payments from Rest of World

3 - Institutions : Firms
U3.2 : Gross Profits
U3.5 : Transfers from Government
U3.8 : Net Transfers from R. of World

4 - Institutions : Households
U4.1 : Wages & Salaries of Employed Labour living in Iskenderun
U4.2 : Wages and Salaries of non-Isk. Labour & Gross Profits of any Unincorporated Enterprises
U4.3 : Distributed Profits
U4.5 : Government's transfers to Households
U4.8 : Net Transfers from R. of World

5 - Institutions : Government
U5.3 : Firms Transfers to Gov-nment
U5.4 : Households' Transfers to Government
U5.5 : indirect taxes on Gov expenditure accruing to Government
U5.6 : Indirect taxes on Investment
U5.7 : Indirect taxes on Production
U5.8 : Export Duties accruing to Government

6 - Savings/Investment Acc.
U6.3 : Firms Savings
U6.4 : Savings of Households
U6.5 : Savings of Government
U6.8 : Balance of Payments Deficit (equal to Inv - Saving Balance)

7 - Production Activities
U7.4 : Consumer Expenditure of Households on Domestic Goods
U7.5 : Consumer Expenditure of Gov. on Domestic Goods
U7.6 : Domestic Capital Formation
U7.7 : Domestic Inter-Industry Flows
U7.8 : Exports of Goods & Services

8 -Rest of World Transactions
U8.3 : Tansfers of Firms to R. of W.
U8.4 : Consumer Expenditure of Households on Imported Goods
U8.5 : Consumer Expenditure of Gov. on Imported Goods
U8.6 : Imports of Investment Goods
U8.7 : Imp. of Intermediary Goods

Total Rows = Total Columns
u'1/u1 : Total Factor Incomes of Isk. Labour
u'2/u2 : Total of other Factor Incomes
u'3/u3 : Total Current Receipts/Exp. of Firms
u'4/u4 : Total Current Receipts/Exp. of Households
u'5/u5 : Total Current Receipts/Exp. of Government
u'6/u6 : Total savings = Investment
u'7/u7 : Gross Output = Prod. Cost
u'8/u8 : Total Current payments abroad = Receipts from abroad

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"TYPE U" SOCIAL ACCOUNTING MATRIX

APPENDIX A

		1 Production Isk. Labour	2 Factors Other	3 Firms	4 nstitutions Households	5 Governmen	6 Sav/Invest. Account	7 Production Activities	8 Rest of World	Total of Rows
1 Prod. Factors	1 Isk. Labour	0	0	0	U 1.4	U 1.5	0	U 1.7	U 1.8	u' 1
2 " " "	2 Oth. Factors	0	0	0	U 2.4	U 2.5	0	U 2.7	U 2.8	u' 2
3 :	3 Firms	0	U 3.2	0	0	U 3.5	0	0	U 3.8	u' 3
4 Institutions	4 Households	U 4.1	U 4.2	U 4.3	0	U 4.5	0	0	U 4.8	u' 4
5 :	5 Government	0	0	U 5.3	U 5.4	U 5.5	U 5.6	U 5.7	U 5.8	u' 5
6 Savings/Investment Account		0	0	U 6.3	U 6.4	U 6.5	0	0	U 6.8	u' 6
7 Production Activities		0	0	0	U 7.4	U 7.5	U 7.6	U 7.7	U 7.8	u' 7
8 Rest of World		0	0	U 8.3	U 8.4	U 8.5	U 8.6	U 8.7	0	u' 8
Total of Columns		u 1	u 2	u 3	u 4	u 5	u 6	u 7	u 8	-

See Appendix C for classifications

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Possible Classifications of "TYPE V" EMPLOYMENT MATRIX

APPENDIX A

Employment categories	Activity Classification										
	1	2	3	4	5	6	7	8	9	10	11
	Irrigation	Oth. Agric.	Food	Oil extrac.	Oth. Mining	Prim proc-g	Light Ind.	Equipment	Construct.	Oil Transp.	Oth.Serv. Total
1 - Managers											
2 - Professional W.											
3 - Clerical W.											
4 - Salesmen											
5 - Agricultural W.											
6 - Craftsmen											
7 - Transport W.											
8 - Oth. Services W.											
Total											

See Appendix C for classifications

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"TYPE T" SOCIAL ACCOUNTING MATRIX

APPENDIX B

		1	2	3	4	5	6	7	8	9	
		Pr. Factors	.....	.....	Institutions	.....	.....	Sav/Invest.	Production	Rest of	Total
			Firms	Isk H-holds	Oth H-holds	Isk Gov	Oth Gov	Account	Activities	World	of Rows
1 Production Factors		0	0	T 1.3	T 1.4	T 1.5	T 1.6	0	T 1.8	T 1.9	t' 1
2 =	2 Firms	T 2.1	0	0	0	T 2.5	T 2.6	0	0	T 2.9	t' 2
3 =	3 Isk Households	T 3.1	T 3.2	0	T 3.4	T 3.5	T 3.6	0	0	T 3.9	t' 3
4 nstitutions	4 oth Households	T 4.1	T 4.2	T 4.3	0	0	T 4.6	0	0	T 4.9	t' 4
5 =	5 Isk Governments	0	T 5.2	T 5.3	0	T 5.5	T 5.6	0	0	T 5.9	t' 5
6 =	6 oth Governments	0	T 6.2	T 6.3	T 6.4	0	T 6.6	T 6.7	T 6.8	T 6.9	t' 6
7 Savings/Investment Account		0	T 7.2	T 7.3	T 7.4	T 7.5	T 7.6	0	0	T 7.9	t' 7
8 Production Activities		0	0	T 8.3	T 8.4	T 8.5	T 8.6	T 8.7	T 8.8	T 8.9	t' 8
9 lest of World		0	T 9.2	T 9.3	T 9.4	T 9.5	T 9.6	T 9.7	T 9.8	0	t' 9
Total of Columns		t 1	t 2	t 3	t 4	t 5	t 6	t 7	t 8	t 9	

See Appendix C for classifications

"T" List of Matrices and Classifications
(Description of Rows = Receipts)

1 - Production Factors
T1.3 /4 : Wages of Domestic Servants
T1.5 /6 : Wages of Civil Servants
T1.8 : Value-Added of Prod. Activities
T1.9 : Net Factor Payments from Rest of World

2 - Institutions : Firms
T2.1 : Gross Profits
T2.5/6 : Transfers from Isk./other Governments to Firms
T2.9 : Net Transfers from R. of World

3 - Institutions : Isk. Households
T3.1 : Wages, Salaries & Gross Profits of Unincorporated Enterprises
T3.2 : Distributed Profits
T3.4 : Transfers from Other H-holds
T3.5/6 : Isk./Other Government's transfers to Isk. Households
T3.9 : Net Transfers from R. of World

4 - Institutions : Oth. Households
T4.1 : Wages, Salaries & Gross Profits of Unincorporated Enterprises
T4.2 : Distributed Profits
T4.3 : Transfers from Isk. H-holds
T4.6 : Oth. Government's transfers to Oth. Households
T4.9 : Net Transfers from R. of World

5 - Institutions : Isk. Gov-nment
T5.2 : Firms Transfers to Isk. Gov.
T5.3 : Isk. H-holds' Transfers to Isk Government
T5.5 : indirect taxes on Gov expenditure accruing to Isk. Government
T5.6 : Oth. Government's transfers to Isk. Government
T5.9 : Export Duties accruing to Isk. Government

6 - Institutions : Oth. Gov-ments
T6.2 : Firms Transfers to Oth. Gov.s
T6.3 : Isk. H-holds' Transfers to Oth. Governments (eg General Gov)
T6.4 : Oth. H-holds' Transfers to Oth. Governments (eg General Gov)
T6.6 : indirect taxes on Gov expenditure accruing to Oth. Governments
T6.9 : Export Duties accruing to Oth. Governments

7 - Savings/Investment Acc.
T7.2 : Firms Savings
T7.3 : Savings of Isk. Households
T7.4 : Savings of Oth. Households
T7.5 : Savings of Isk. Government
T7.6 : Savings of Oth. Governments
T7.9 : Balance of Payments Deficit (equal to Inv - Saving Balance)

8 - Production Activities
T8.3 : Consumer Expenditure of Isk. H-holds on Domestic Goods
T8.4 : Consumer Expenditure of Oth. H-holds on Domestic Goods
T8.5 : Consumer Expenditure of Isk. Gov. on Domestic Goods
T8.6 : Consumer Expenditure of Oth. Gov.s on Domestic Goods
T8.7 : Domestic Capital Formation
T8.8 : Domestic Inter-Industry Flows
T8.9 : Exports of Goods & Services

9 -Rest of World Transactions
T9.2 : Tansfers of Firms to R. of W.
T9.3 : Consumer Expenditure of Isk. H-holds on Imported Goods
T9.4 : Consumer Expenditure of Oth. H-holds on Imported Goods
T9.5 : Consumer Expenditure of Isk. Gov. on Imported Goods
T9.6 : Consumer Expenditure of Oth. Gov.s on Imported Goods
T9.7 : Imports of Investment Goods
T9.8 : Imports of Intermediary Goods

Total Rows = Total Columns
t'1/t1 : Total Factor Incomes
t'2/t2 : Total Current Receipts/Exp. of Firms
t'3/t3 : Total Current Receipts/Exp. of Isk. Households
t'4/t4 : Total Current Receipts/Exp. of Oth. Households
t'5/t5 : Total Current Receipts/Exp. of Isk. Government
t'6/t6 : Total Current Receipts/Exp. of Oth. Governments
t'7/t7 : Total savings = Investment
t'8/t8 : Gross Output = Prod. Cost
t'9/t9 : Total Current payments abroad = Receipts from abroad

Suggested Alternative Classifications

('U' and 'T' refer to classifications in Appendices A and B respectively)

I - Possible Classification of Production Factors

U- Employed Labour in Iskenderun
Other employed Labour
Private Housing
Private Capital (incl. unincorporated Capital)
Public Corporate Capital

This minimum classification may be greatly improved by breaking down the "Employed Labour" category into : "Employee" and "Self-employed" at least within those employed in Iskenderun.

The "Self-Employed" category to include own-account workers and employers of unincorporated firms. The great advantage of so doing is to avoid the impossible problem of breaking down the gross income of this category into labour services and return to capital.

Thus, we suggest as "U variant 1" :

U-1 *Employee* Labour in Iskenderun
Self-employed in Iskenderun
Oth. employed Labour (incl self-employed *elsewhere*)
Private Housing
Private *Corporate* Capital
Public Corporate Capital

II- Possible Classification of Institutions

T- Firms
Isk. Households
Other Households
Isk. Government
Other Governments

A systematic identification of *Firms located in Isk.* within "Firms", could be added here, but another attempt, albeit less complete, is shown later in the classification of Production Activities.

Further disaggregations of Households can be devised, depending on sources, eg the *'Urban' -' Rural'* distinction, at least for Isk. Households.

Another example is to break down Isk. Households so as to identify *low income* categories, drawing from households surveys with an appropriate income classification.

I - Possible Classification of Production Activities

Possible classifications of production activities and employment are given in type V matrix. This example, however, does not identify major industrial activities of the Isk Region, which should in any case be identified in this classification, say A, B, C, D... .

Using U-1 classification for Factors payments, matrix *U 1.7* would identify employee wages *and* returns from unincorporated enterprises paid in Isk. region, originating from these activities.

But this would not permit to separate other Factors payments in Isk., i.e. private housing, private and public corporate capital. This could only be done by creating a category of activity explicitly located in Isk., eg "Oil pipelines of Isk region" in the "Oil Transport" activity. As a consequence, in such activities, all factors payments in Isk. would be identified in U 1.7, as would be their inputs in U 7.7, their expenditures in other entries of row U 7, including exports in U 7.8, and finally related intermediary imports in row 8. Finally, the matrix of employed labour (V) would trace up employment figures in Isk. by such activities.

Another suggestion is to identify major *low-productivity* activities (as distinct from modern activities). This can be attempted in various ways :

- In the categories "Irrigation" and "OtherAgriculture", a classification by *size of holding* with appropriate size classes, could achieve it.
- In mining and manufacturing, an *"low-productivity industry"* could be created, which would cut across the two Mining categories as well as the four manufacturing categories (Food Processing, Light Industry, Primary Processing, and Equipment) which would then be restricted to modern Industries.
- Same suggestion for construction, ie *"low-productivity construction"*, and for specific services.

The interest of such a distinction is to identify both related flows and employment figures in matrices T and V.

APPRENDIX 4

Approche Patrimoniale de la Gestion des Espaces et des Ressources Naturels

APPROCHE PATRIMONIALE DE LA GESTION DES ESPACES ET DES RESSOURCES NATURELS

GREF
Revue des Eleves de
l'Ecole Nationale du Génie Rural, des Eaux et des Forêts

QUELQUES MOTS D'INTRODUCTION

Les problèmes posés par la gestion de la nature prennent aujourd'hui une ampleur et des formes telles que les média leur consacrent une attention accrue.

De la pollution d'une nappe phréatique à la dégradation de la couche d'ozone, l'homme est impliqué dans l'altération des espaces et des ressources naturels. Le poids des activités humaines sur les équilibres naturels nous contraint à mieux "gérer" les milieux naturels afin de maîtriser à la fois l'évolution de ces milieux et le développement de notre société. Cette gestion doit s'appliquer à une grande diversité de situations, tant les problèmes affectent des milieux différents par leur nature, leur échelle et leur capacité d'évolution.

L'approche patrimoniale de la gestion des espaces et ressources naturels propose une démarche nouvelle qui essaie de pallier les insuffisances des modes de gestion actuels. Formulée par Henry OLLAGNON (Conseiller Technique auprès du Directeur des Affaires Financières et Economiques du Ministère de l'Agriculture), elle s'est développée depuis 1975 à l'occasion de démarches de "recherches-action" auxquelles les ingénieurs du G. R. E. F. ont souvent participé. Le recueil des travaux d'élèves relatifs à cette approche témoigne d'une continuité dans cette contribution.

L'exposé des principes et concepts qui fondent la gestion patrimoniale est suivi de la présentation de l'audit patrimonial, outil d'acquisition des connaissances propre à cette stratégie. Certains cas complexes de gestion, historiquement importants dans le développement de l'approche, sont aussi évoqués. Enfin, les perspectives de diffusion de l'approche, encore largement potentielles, sont abordées.

Il faut souligner ici le large champ d'application de la démarche patrimoniale qui intéresse tout problème complexe de gestion de la qualité comme l'évaluation stratégique d'une politique publique ou l'audit patrimonial de l'entreprise. Cette validité étendue de la démarche est à l'image de la souplesse d'utilisation suggérée aux gestionnaires.

LES FONDEMENTS DE L'APPROCHE PATRIMONIALE

LES INSUFFISANCES DES MODES DE GESTION ACTUELS

Face à un problème global mais à multiples facettes, les modes de gestion des milieux naturels restent trop souvent cloisonnés. Ils privilégient des discours formels (écologique, économique, technique, administratif...) qui ne s'intéressent qu'à un aspect de gestion et prétendent résoudre, sans recherche spécifique, toutes les situations de problème possible.

Au contraire, les approches plus pragmatiques, qui supposent des investigations nouvelles pour résoudre chaque problème, sont délaissées, en même temps que les aspects psychologiques, sociologiques ou politiques qu'elles sont susceptibles d'intégrer.

LES PRINCIPES D'UNE DEMARCHE NOUVELLE

• **La question de la complexité:**

Admettre la complexité des phénomènes engendrant un problème de gestion de la nature constitue le point de départ d'une démarche nouvelle. Ceci ne signifie nullement prétendre à une description de tous les éléments et relations en jeu au sein d'une unité naturelle ou humaine, mais d'en restituer l'essentiel de la complexité relativement au problème qu'elle pose.

Réunir et confronter les approches cloisonnées, parcellisées aujourd'hui pratiquées, au lieu de les juxtaposer et de les opposer, constitue un premier pas dans cette voie.

Il convient aussi de leur associer une démarche pragmatique qui s'attache à comprendre les actes élémentaires dont la combinaison aboutit à une gestion globale. Si on entend par acteur tout individu, ou collectivité d'individus, ou encore communauté d'individus, agissant plus ou moins directement sur les procédés de gestion d'un ensemble complexe d'objets, une approche pragmatique consiste à observer ces acteurs en situation d'action pour déterminer leur motivation et apprécier la rationalité de leurs actes face à ces intentions. Une telle démarche essaiera aussi d'évaluer l'impact de chaque acte élémentaire sur la gestion globale, à travers une recherche d'autant plus importante et difficile que le nombre d'acteurs impliqués dans l'existence d'un problème de gestion de la nature est souvent élevé.

Observer l'acteur en situation d'action permet d'integrer les aspects psychologiques, sociologiques ou politiques d'une gestion. C'est à ce niveau que les comportements apparemment irrationnels peuvent se révéler conformes à des motivations propres à l'acteur ; en particulier, les actes contraires à l'interêt des generations futures peuvent alors s'expliquer.

L'AUDIT PATRIMONIAL

L'audit patrimonial est l'outil d'acquisition des connaissances privilégié de l'approche Patrimoniale. Comme les concepts de gestion patrimoniale, il s'est développé au cours des démarches de recherche-action dans le cadre de missions d'évaluation et d'amélioration des politiques publiques (Ministère de l'Agriculture, DAFE).

Le but de cette méthode est d'accéder, par l'analyse du système d'action, à la gestion effective d'un système-qualité, face à une situation de résolution de problème. Elle repose sur l'écoute active des acteurs du système d'action, qui sont considérés au cours des entretiens comme experts de leur niveau d'action.

L'élaboration d'une procédure d'audit suppose une première analyse qui identifie le problème à résoudre et les systèmes à considérer pour rendre compte le plus globalement possible de la situation de problème. Il en découle un choix d'acteurs ou de groupes d'acteurs à écouter. Selon le niveau d'intervention de ces acteurs au sein du système, ils seront considérés comme des macro-acteurs (ex: niveau national) ou des micro-acteurs (ex: niveau local), (Figure 1).

MISE EN ŒUVRE DE L'AUDIT PATRIMONIAL

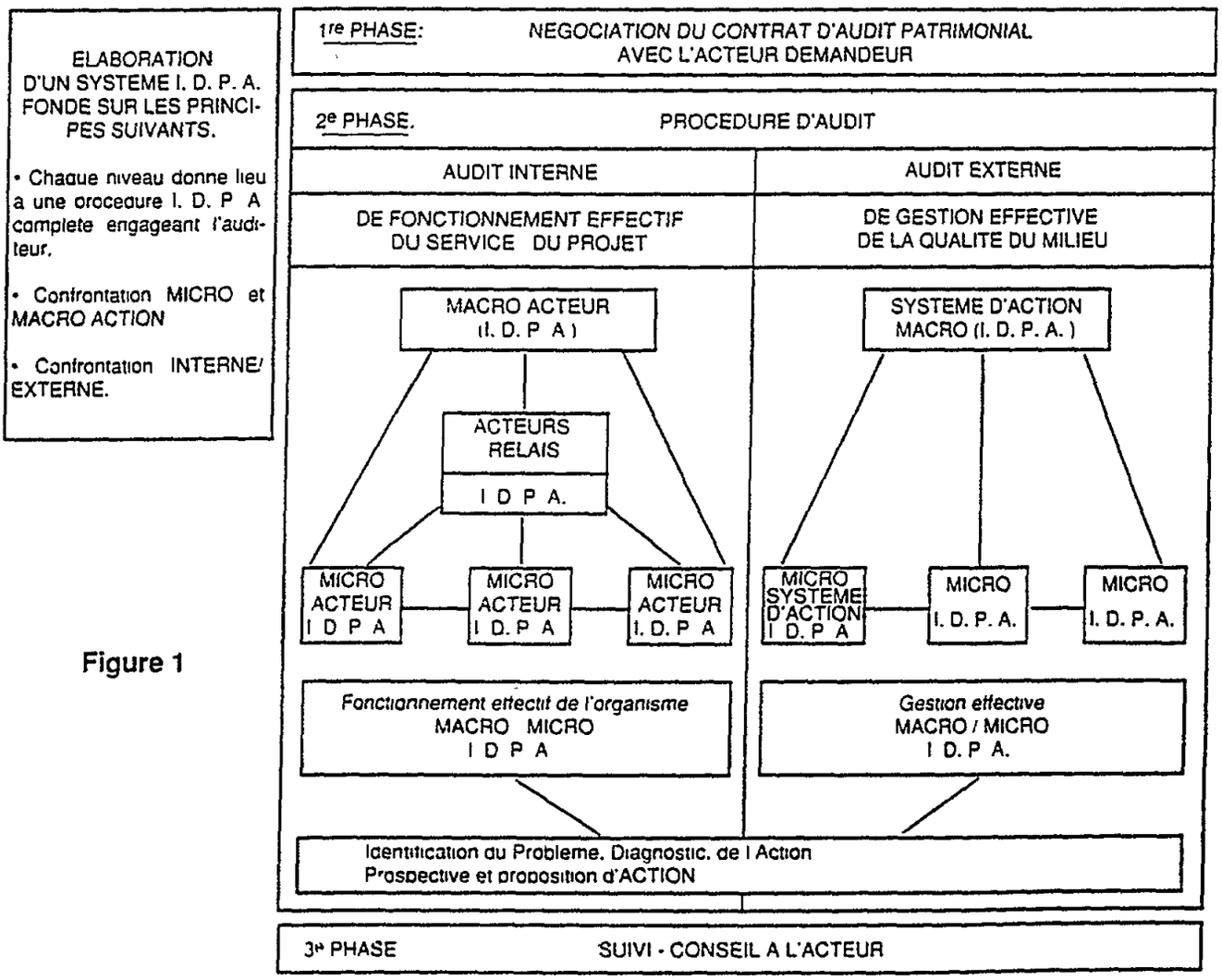

Figure 1

• **L'analyse systémique:**

L'analyse systémique fournit un cadre apte a représenter une réalité complexe, combinaison de nombreuses approches possibles. Le langage systémique suppose en effet de définir différentes échelles d'observation d'une situation réelle, d'identifier des ensembles d'éléments homogènes ou systèmes, de décrire un tissu de relations liant les parties d'un tout. Cependant, pas plus qu'une autre méthode d'analyse, l'analyse systémique ne saurait décrire tous les éléments et toutes les relations constitutifs d'une réalité. Le choix d'échelles d'observation, de critères d'homogénéité des parties, du sens à donner aux relations décrites est conditionné par le problème à résoudre. Cerner ce problème, c'est se donner la possibilité de répondre à la question: quelle intention a-t-on en décrivant tel élément impliqué dans une situation problématique?

• **La notion de qualité:**

La qualité des espaces et ressources naturelles rassemble et combine un ensemble de descripteurs utiles à l'appréciation de l'état du milieu naturel et de son évolution face au problème soulevé.

En l'associant à la notion de système, la qualité devient la propriété globale émergente d'un système-qualité qui se définit comme unité naturelle et humaine, la plus petite permettant d'approcher le problème posé dans sa globalité.

Références bibliographiques:

- "General System Theory" - VON BERTALANFFY - Braziller New-York 1968.
- "Le Macroscope" - J. DE ROSNAY - Points/Seuil Ed. 75.
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LES CONCEPTS DE LA GESTION PATRIMONIALE

• **Patrimoine et relation patrimoniale:**

La gestion patrimoniale de la qualité des espaces et ressources naturels repose sur la notion de patrimoine, qu'Henry OLLAGNON définit ainsi: "ensemble d'éléments matériels et immatériels en relation qui concourent à maintenir et développer l'identité et l'autonomie de son (ses) titulaire (s), dans le temps et dans l'espace, par adaptation en milieu évolutif". Les termes "éléments", "relations", et "ensemble" évoquent clairement la systémique et la notion de qualité est sous-jacente puisqu'elle apparaît comme capacité de "l'ensemble d'éléments" à satisfaire son titulaire.

Le patrimoine n'a ici de sens que si une ou des relations patrimoniales, ou patrimonialité, existent. La patrimonialité est la relation d'un titulaire à un patrimoine. Selon son intensité (1) et sa nature (2), les actes de gestion du titulaire répondent à des motivations différentes. Et selon le titulaire (3), le poids de l'acte élémentaire est plus ou moins déterminant de la qualité du patrimoine.

(1): absente, latente ou active.
(2): fonctionnelle, métafonctionnelle (combinaison négociée de fonctions), identitaire.
(3): individu, collectivité ou communauté.

• **Gestion effective et évolution possible du mode de gestion:**

Une fois la problématique définie (la définition évolue au cours de la phase de recherche), l'approche patrimoniale consiste à décrire l'état et le poids des relations patrimoniales de chaque titulaire au patrimoine considéré (système-qualité). Ceci conduit à révéler quelle gestion est effectivement conduite par rapport au problème posé.

L'étape suivante s intéresse aux moyens de faire évoluer cette gestion. Elle revient à poser les questions suivantes:

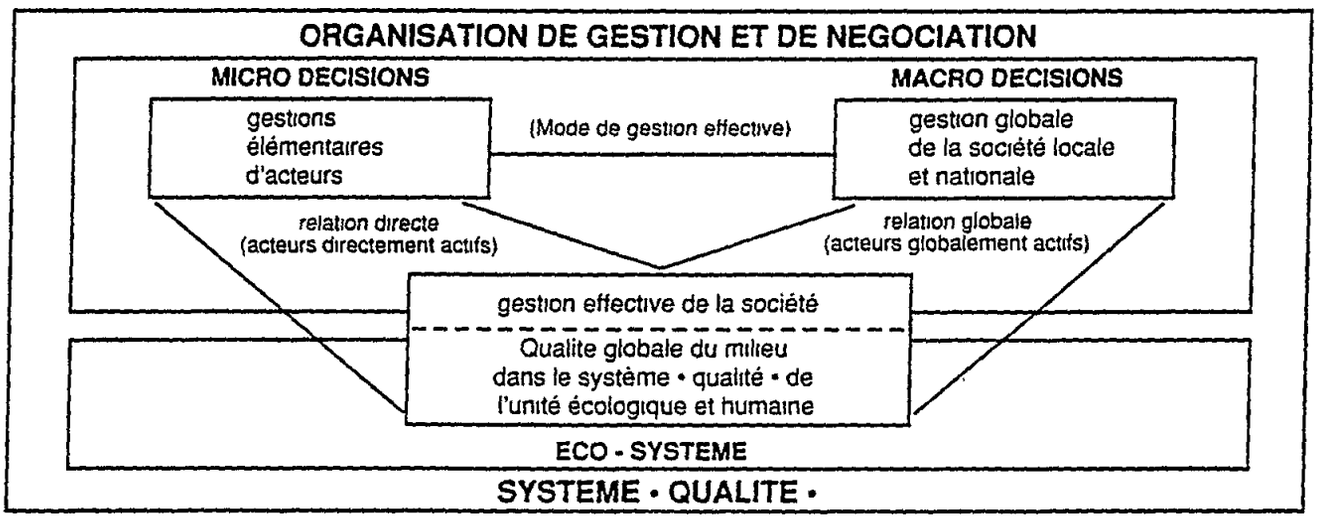
- Quelles patrimonialités peut-on modifier dans leur nature, leur intensité ou leur titulaire?
- Quelles modifications concourent à résoudre le problème?

• Offres et demandes de qualité:

La gestion effective de la qualité et ses possibilités d'évolution sont respectivement synthétisées en termes d'offres et de demandes réelles et potentielles de qualité. Face aux déséquilibres possibles entre offres et demandes réelles liés à l'existence du problème, l'identification éventuelle de potentiels non exprimés contribue à l'évaluation des possibilités de rétablissement d'un état de qualité souhaité.

Le langage systémique facilite la représentation de ces déséquilibres et de leur évolution possible.

UNE GRILLE DE DIAGNOSTIC DE GESTION EFFECTIVE



• Négociation patrimoniale:

Dès lors que le problème à résoudre est clairement identifié, que la gestion effective du système-qualité par le système d'acteurs est connue, que les possibilités d'évolution du mode de gestion sont établies, en somme dès lors que la démarche de recherche est achevée, l'action à mener est préparée par une négociation.

Si le patrimoine concerné est effectivement géré, il existe des patrimonialités et il convient de réunir l'ensemble des acteurs identifiés pour leur proposer les différentes évolutions possibles conduisant à la résolution du problème. A partir de là, si des accords émergent, des lieux et dates (fréquence) de renégociation et des règles de gestion sont proposés.

Cette étape nécessite probablement qu'un médiateur, facilitant la communication entre acteurs représentés de manière objective, conduise les négociations.

Cette phase de préparation à l'action concertée et négociée met en jeu, in fine, les principes de démocratie et se révèle cruciale pour la réussite de l'action. Chacun des acteurs doit accepter positivement le choix de l'ensemble et ce choix doit satisfaire au maximum chaque acteur.

Pratiquement, la négociation s'appuie sur l'activation des patrimonialités. Elle a pour objet de rendre chaque acteur conscient de sa relation patrimoniale, de la renforcer si nécessaire et de

confronter de manière positive l'ensemble des patrimonialités afin que des changements bénéfiques pour le système-qualité et acceptables par l'ensemble des titulaires patrimoniaux émergent.

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APPENDIX 5

Population Data

REGION / PROVINCE	Total Population			Urban Population			Urbanization Rate (%)			Annual Growth Rate 1980/1985		Annual Growth Rate 1985/1990		Density (inhab./km2)			Area km2
	1980	1985	1990	1980	1985	1990	1980	1985	1990	Total Pop	Urban Pop	Total Pop	Urban Pop	1980	1985	1990	
BLACK SEA	6 225 229	6 649 830	6 827 304	1 761 048	2 424 813	2 731 840	28,3	36,5	40,0	1,3	6,6	0,5	2,4	77	82	84	81 295
WEST ANATOLIA	3 221 095	3 539 793	3 864 661	1 309 038	1 706 638	1 959 305	40,6	48,2	50,7	1,9	5,4	1,8	2,8	18	20	22	176 311
CENTRAL ANATOLIA	10 967 974	12 192 933	13 096 179	5 338 603	6 722 277	7 668 556	48,7	55,1	58,6	2,1	4,7	1,4	2,7	46	52	55	236 347
EAST ANATOLIA	5 662 809	6 454 540	6 867 415	1 927 609	2 537 514	3 027 072	34,0	39,3	44,1	2,7	5,7	1,2	3,6	74	84	89	77 031
SOUTH-EAST ANATOLIA	1 976 400	2 251 996	2 699 776	1 010 744	1 260 350	1 621 283	51,1	56,0	60,1	2,6	4,5	3,7	5,2	50	57	68	39 749
THRACE	4 325 306	5 089 197	5 975 449	3 588 013	4 330 127	5 084 585	83,0	85,1	85,1	3,3	3,8	3,3	3,3	182	214	251	23 794
EDIRNE	*363 286*	*389 638*	*404 599*	*153 236*	*183 033*	*210 421*	*42,2*	*47,0*	*52,0*	*1,4*	*3,6*	*0,8*	*2,8*	*58*	*62*	*64*	*6 276*
CANAKKALE (1)	*391 568*	*417 121*	*432 263*	*126 703*	*148 150*	*168 529*	*32,4*	*35,5*	*39,0*	*1,3*	*3,2*	*0,7*	*2,6*	*40*	*43*	*44*	*9 737*
MED. PROVINCES	754 854	806 759	836 862	279 939	331 183	378 950	37,1	41,1	45,3	1,3	3,4	0,7	2,7	47	50	52	16 013
MARMARA AND EGEAN	8 423 493	9 832 743	11 698 384	5 088 289	6 505 111	7 962 186	60,4	66,2	68,1	3,1	5,0	3,5	4,1	98	115	137	85 560
BALIKESIR	*853 177*	*910 282*	*973 314*	*344 368*	*414 694*	*468 758*	*40,4*	*45,6*	*48,2*	*1,3*	*3,8*	*1,3*	*2,5*	*60*	*64*	*68*	*14 292*
AYDIN	*652 488*	*743 643*	*824 816*	*245 329*	*335 707*	*384 711*	*37,6*	*45,1*	*46,6*	*2,6*	*6,5*	*2,1*	*2,8*	*81*	*93*	*103*	*8 007*
IZMIR	*1 976 763*	*2 317 829*	*2 694 770*	*1 485 630*	*1 809 924*	*2 134 816*	*75,2*	*78,1*	*79,2*	*3,2*	*4,0*	*3,1*	*3,4*	*165*	*194*	*225*	*11 973*
MUGLA	*438 145*	*486 066*	*562 809*	*111 769*	*149 788*	*186 397*	*25,5*	*30,8*	*33,1*	*2,1*	*6,0*	*3,0*	*4,5*	*33*	*36*	*42*	*13 338*
MED. PROVINCES	3 920 573	4 457 820	5 055 709	2 187 096	2 710 113	3 174 682	55,8	60,8	62,8	2,6	4,4	2,5	3,2	82	94	106	47 610
MEDITERRANEAN	3 934 651	4 653 426	5 443 867	1 969 974	2 652 824	3 271 524	50,1	57,0	60,1	3,4	6,1	3,2	4,3	67	79	92	59 100
ANTALYA	*748 706*	*891 149*	*1 132 211*	*296 775*	*417 162*	*602 194*	*39,6*	*46,8*	*53,2*	*3,5*	*7,0*	*4,9*	*7,6*	*36*	*43*	*55*	*20 591*
ICEL	*843 931*	*1 034 085*	*1 266 995*	*429 897*	*604 271*	*787 284*	*50,9*	*58,4*	*62,1*	*4,1*	*7,0*	*4,1*	*5,4*	*53*	*65*	*80*	*15 853*
ADANA	*1 485 743*	*1 725 940*	*1 934 907*	*876 752*	*1 150 529*	*1 350 339*	*59,0*	*66,7*	*69,8*	*3,0*	*5,6*	*2,3*	*3,3*	*86*	*100*	*112*	*17 253*
HATAY	*856 271*	*1 002 252*	*1 109 754*	*366 550*	*480 862*	*531 707*	*42,8*	*48,0*	*47,9*	*3,2*	*5,6*	*2,1*	*2,0*	*158*	*185*	*205*	*5 403*
MED. PROVINCES	3 934 651	4 653 426	5 443 867	1 969 974	2 652 824	3 271 524	50,1	57,0	60,1	3,4	6,1	3,2	4,3	67	79	92	59 100
TURKEY	*44 736 957*	*50 664 458*	*56 473 035*	*21 993 318*	*28 139 654*	*33 326 351*	*49,2*	*55,5*	*59,0*	*2,5*	*5,1*	*2,2*	*3,4*	*57*	*65*	*72*	*779 452*
TOTAL MED. REGIONS	16 683 450	19 575 366	23 117 700	10 646 276	13 488 062	16 318 295	63,8	68,9	70,6	3,2	4,8	2,1	2,0	99	116	137	168 454
TOTAL MED. PROVINCES	8 610 078	9 918 005	11 336 438	4 437 009	5 694 120	6 825 156	51,5	57,4	60,2	2,9	5,1	2,1	2,0	70	81	92	122 723

(1) In this table, the CANNAKALE province has been count in THRACE thought a part is in MARMARA and EGEAN (See previous tables)

Sources : 1985 and 1990 population census

Blue Plan 1993

REGION / PROVINCE	POPULATION							
	1955	1960	1965	1970	1975	1980	1985	1990
BLACK SEA	**3 881 441**	**4 451 069**	**4 960 685**	**5 401 000**	**5 783 927**	**6 225 229**	**6 652 172**	**6 827 304**
WEST ANATOLIA	**2 102 819**	**2 373 442**	**2 569 566**	**2 809 337**	**3 017 987**	**3 221 095**	**3 538 253**	**3 864 661**
CENTRAL ANATOLIA	**6 031 685**	**6 943 033**	**7 884 484**	**8 941 209**	**10 169 879**	**10 967 974**	**12 193 155**	**13 096 179**
EAST ANATOLIA	**3 106 485**	**3 572 997**	**4 074 325**	**4 655 489**	**5 185 534**	**5 662 809**	**6 290 086**	**6 867 415**
SOUTH-EAST ANATOLIA	**1 030 688**	**1 189 909**	**1 359 704**	**1 597 763**	**1 832 903**	**1 976 400**	**2 413 593**	**2 699 776**
THRACE	**1 960 332**	**2 284 625**	**2 655 768**	**3 210 792**	**3 800 063**	**4 325 306**	**5 089 197**	**5 975 449**
EDIRNE	*252 190*	*276 479*	*303 234*	*316 425*	*340 732*	*363 286*	*389 638*	*404 599*
CANAKKALE (1)	*51 959*	*51 140*	*50 393*	*53 041*	*50 557*	*53 477*	*57 735*	*57 639*
MED. PROVINCES	304 149	327 619	353 627	369 466	391 289	416 763	447 373	462 238
MARMARA AND EGEAN	**4 229 942**	**4 877 080**	**5 479 840**	**6 194 868**	**7 188 664**	**8 423 493**	**9 834 576**	**11 698 384**
CANAKKALE (2)	*259 497*	*286 470*	*299 924*	*307 723*	*318 828*	*338 091*	*359 386*	*374 624*
BALIKESIR	*612 013*	*670 669*	*708 342*	*749 669*	*789 255*	*853 177*	*910 282*	*973 314*
AYDIN	*414 564*	*467 341*	*524 918*	*564 802*	*609 869*	*652 488*	*743 419*	*824 816*
IZMIR	*910 496*	*1 063 490*	*1 234 667*	*1 427 173*	*1 673 966*	*1 976 763*	*2 317 829*	*2 694 770*
MUGLA	*267 579*	*299 611*	*334 973*	*368 776*	*400 796*	*438 145*	*486 290*	*562 809*
MED. PROVINCES	2 464 149	2 787 581	3 102 824	3 418 143	3 792 714	4 258 664	4 817 206	5 430 333
MEDITERRANEAN	**1 721 371**	**2 062 665**	**2 407 049**	**2 794 718**	**3 368 762**	**3 934 651**	**4 653 426**	**5 443 867**
ANTALYA	*357 568*	*416 130*	*486 910*	*577 334*	*669 357*	*748 706*	*891 149*	*1 132 211*
ICEL	*371 667*	*444 523*	*511 273*	*590 943*	*714 817*	*843 931*	*1 034 085*	*1 266 995*
ADANA	*628 505*	*760 803*	*902 712*	*1 035 377*	*1 240 475*	*1 485 743*	*1 725 940*	*1 934 907*
HATAY	*363 631*	*441 209*	*506 154*	*591 064*	*744 113*	*856 271*	*1 002 252*	*1 109 754*
MED. PROVINCES	1 721 371	2 062 665	2 407 049	2 794 718	3 368 762	3 934 651	4 653 426	5 443 867
TURKEY	***24 064 763***	***27 754 820***	***31 391 421***	***35 605 176***	***40 347 719***	***44 736 957***	***50 664 458***	***56 473 035***
TOTAL MED. REGIONS	**7 911 645**	**9 224 370**	**10 542 657**	**12 200 378**	**14 357 489**	**16 683 450**	**19 577 199**	**23 117 700**
TOTAL MED. PROVINCES	4 489 669	5 177 865	5 863 500	6 582 327	7 552 765	8 610 078	9 918 005	11 336 438

(1) CANNAKALE zone in THRACE

(2) CANNAKALE zone in MARMARA AND EGEAN

Sources : 1990 population census

Blue Plan 1993

REGION / PROVINCE	Population Annual Growth Rate (%)							
	1955-60	1960-65	1965-70	1970-75	1975-80	1980-85	1985-90	1955-1990
BLACK SEA	2,8	2,2	1,7	1,4	1,5	1,3	0,5	1,6
WEST ANATOLIA	2,5	1,6	1,8	1,4	1,3	1,9	1,8	1,8
CENTRAL ANATOLIA	2,9	2,6	2,5	2,6	1,5	2,1	1,4	2,2
EAST ANATOLIA	2,8	2,7	2,7	2,2	1,8	2,1	1,8	2,3
SOUTH-EAST ANATOLIA	2,9	2,7	3,3	2,8	1,5	4,1	2,3	2,8
THRACE	3,1	3,1	3,9	3,4	2,6	3,3	3,3	3,2
EDIRNE	*1,9*	*1,9*	*0,9*	*1,5*	*1,3*	*1,4*	*0,8*	*1,4*
CANAKKALE (1)	*-0,3*	*-0,3*	*1,0*	*-1,0*	*1,1*	*1,5*	*0,0*	*0,3*
MED. PROVINCES	1,5	1,5	0,9	1,2	1,3	1,4	0,7	1,2
MARMARA AND EGEAN	2,9	2,4	2,5	3,0	3,2	3,1	3,5	2,9
CANAKKALE (2)	*2,0*	*0,9*	*0,5*	*0,7*	*1,2*	*1,2*	*0,8*	*1,1*
BALIKESIR	*1,8*	*1,1*	*1,1*	*1,0*	*1,6*	*1,3*	*1,3*	*1,3*
AYDIN	*2,4*	*2,4*	*1,5*	*1,5*	*1,4*	*2,6*	*2,1*	*2,0*
IZMIR	*3,2*	*3,0*	*2,9*	*3,2*	*3,4*	*3,2*	*3,1*	*3,1*
MUGLA	*2,3*	*2,3*	*1,9*	*1,7*	*1,8*	*2,1*	*3,0*	*2,1*
MED. PROVINCES	2,5	2,2	2,0	2,1	2,3	2,5	2,4	2,3
MEDITERRANEAN	3,7	3,1	3,0	3,8	3,2	3,4	3,2	3,3
ANTALYA	*3,1*	*3,2*	*3,5*	*3,0*	*2,3*	*3,5*	*4,9*	*3,3*
ICEL	*3,6*	*2,8*	*2,9*	*3,9*	*3,4*	*4,1*	*4,1*	*3,6*
ADANA	*3,9*	*3,5*	*2,8*	*3,7*	*3,7*	*3,0*	*2,3*	*3,3*
HATAY	*3,9*	*2,8*	*3,2*	*4,7*	*2,8*	*3,2*	*2,1*	*3,2*
MED. PROVINCES	3,7	3,1	3,0	3,8	3,2	3,4	3,2	3,3
TURKEY	*2,9*	*2,5*	*2,6*	*2,5*	*2,1*	*2,5*	*2,2*	*2,5*
TOTAL MED. REGIONS	3,1	2,7	3,0	3,3	3,0	3,3	3,4	3,1
TOTAL MED. PROVINCES	2,9	2,5	2,3	2,8	2,7	2,9	2,7	2,7

(1) CANNAKALE zone in THRACE

(2) CANNAKALE zone in MARMARA AND EGEAN

Sources : 1990 population census

Blue Plan 1993

ISKENDERUN PROJECT : POPULATION, DENSITY, URBANISATION RATE ET GROWTH RATE FOR THE COASTAL DISTRICTS

	AREA 1985 (km2)	1980				1985				ANNUAL GROWTH RATE 1980-85	
		TOTAL POPULATION	URBAN POPULATION	URBAN. RATE (%)	POPULATION DENSITY (inhab./km2)	TOTAL POPULATION	URBAN POPULATION	URBAN RATE (%)	POPULATION DENSITY (inhab./km2)	TOTAL POPULATION %	URBAN POPULATION %
ADANA	17 253	1 485 743	876 752	59,0	86	1757102	1169077	66,5	102	3,4	5,9
KARATAS	*1 292*	*66 640*	*5 695*	*8,5*	*52*	*53 942*	*8 101*	*15,0*	*42*	*-4,1*	*7,3*
YUMURTALIK	*501*	*19 701*	*2 444*	*12,4*	*39*	*20 610*	*3 946*	*19,1*	*41*	*0,9*	*10,1*
Coastal Districts	1 793	86 341	8 139	9,4	48	74 552	12 047	16,2	42	-2,9	8,2
HATAY	5 403	856 271	366 550	42,8	158	1 034 029	459 069	44,4	191	3,8	4,6
DORTYOL	*878*	*84 076*	*25 905*	*30,8*	*96*	*144 942*	*34 819*	*24,0*	*165*	*11,5*	*6,1*
ISKENDERUN	*956*	*237 571*	*124 824*	*52,5*	*249*	*273 705*	*173 607*	*63,4*	*286*	*2,9*	*6,8*
SAMANDAGI	*382*	*64 998*	*23 672*	*36,4*	*170*	*82 656*	*27 264*	*33,0*	*216*	*4,9*	*2,9*
YAYLADAGI	*366*	*24 876*	*5 304*	*21,3*	*68*	*26 514*	*6 422*	*24,2*	*72*	*1,3*	*3,9*
Coastal Districts	2 582	411 521	179 705	43,7	159	527 817	242 112	45,9	204	5,1	6,1
ADANA + HATAY	22 656	2 342 014	1 243 302	53,1	103	2 791 131	1 628 146	58,3	123	3,6	5,5
Coastal Districts	4 375	497 862	187 844	37,7	114	602 369	254 159	42,2	138	3,9	6,2

	AREA 1985 (km2)	1985				1990				ANNUAL GROWTH RATE 1985-90	
		TOTAL POPULATION	URBAN POPULATION	URBAN. RATE (%)	POPULATION DENSITY (inhab./km2)	TOTAL POPULATION	URBAN POPULATION	URBAN. RATE (%)	POPULATION DENSITY (inhab./km2)	TOTAL POPULATION %	URBAN POPULATION %
ADANA	17 253	1757102	1169077	66,5	102	1 934 907	1 350 339	69,8	112	1,9	2,9
KARATAS (1)	*922*	*26 317*	*7 065*	*26,8*	*29*	*26 450*	*9 025*	*34,1*	*29*	*0,1*	*5,0*
YUMURTALIK	*501*	*20 345*	*3 835*	*18,8*	*41*	*20 957*	*3 583*	*17,1*	*42*	*0,6*	*-1,4*
Coastal Districts	1 423	46 662	10 900	23,4	33	47 407	12 608	26,6	33	0,3	3,0
HATAY	5 403	1 034 029	459 069	44,4	191	1 109 754	531 707	47,9	205	1,4	3,0
ERZIN (2)	*100*	*25 133*	*18 593*	*74,0*	*251*	*29 160*	*22 477*	*77,1*	*292*	*3,0*	*3,9*
DORTYOL (2)	*778*	*104 166*	*44 170*	*42,4*	*134*	*111 368*	*47 144*	*42,3*	*143*	*1,3*	*1,3*
ISKENDERUN (3)	*706*	*239 381*	*152 096*	*63,5*	*339*	*259 475*	*154 807*	*59,7*	*368*	*1,6*	*0,4*
SAMANDAGI	*382*	*82 934*	*27 477*	*33,1*	*217*	*89 202*	*29 857*	*33,5*	*234*	*1,5*	*1,7*
YAYLADAGI	*366*	*26 342*	*6 432*	*24,4*	*72*	*26 172*	*6 496*	*24,8*	*72*	*-0,1*	*0,2*
Coastal Districts	2 332	477 956	248 768	52,0	205	515 377	260 781	50,6	221	1,5	0,9
ADANA + HATAY	22 656	2 791 131	1 628 146	58,3	123	3 044 661	1 882 046	61,8	134	1,8	2,9
Coastal Districts	3 755	524 618	259 668	49,5	140	562 784	273 389	48,6	150	1,4	1,0

(1) KARATAS a été redecoupé

(2) DORTYOL has been split in two coastal districts : ERZIN and DORTYOL

(3) ISKENDERUN has been split in two districts : BELEN and ISKENDERUN (coastal)

Sources : 1985 et 1990 population census

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APPENDIX 6

Road Transportation Data

	NUMBERS OF ROAD MOTOR VEHICLES										Multiplier
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1980-89
EDIRNE	9 015	9 492	10 118	10 816	11 894	13 172	14 562	15 169	15 878	17 517	1,94
CANAKKALE	11 160	11 971	12 675	13 892	14 929	16 094	17 688	19 277	20 866	23 110	2,07
BALIKESIR	24 429	25 196	25 789	26 575	28 529	31 412	35 676	39 805	43 959	49 485	2,03
AYDIN	23 351	25 875	27 501	30 809	34 569	38 846	43 007	48 254	52 241	57 405	2,46
IZMIR	104 944	109 621	114 343	121 000	131 528	143 005	161 171	177 306	191 594	205 944	1,96
MUGLA	14 608	15 590	16 335	18 473	20 915	23 702	26 453	30 597	34 773	39 805	2,72
ANTALYA	34 289	38 285	42 714	47 755	54 356	61 607	71 222	82 042	91 921	101 316	2,95
ICEL	26 894	30 539	34 417	37 708	42 992	48 074	53 763	59 633	67 445	73 186	2,72
ADANA	47 353	50 987	54 447	61 358	69 020	777 232	84 330	91 552	97 512	103 495	2,19
HATAY	28 947	31 600	32 571	38 268	42 607	46 449	51 587	55 474	59 630	64 835	2,24
TURKEY	*1 344 231*	*1 420 619*	*1 502 288*	*1 610 566*	*1 751 701*	*1 888 571*	*2 075 215*	*2 258 800*	*2 456 688*	*2 659 778*	1,98
MED. PROVINCES	324 990	349 156	370 910	406 654	451 339	1 199 593	559 459	619 109	675 819	736 098	*2,26*

Source : Environnemental Statistics, Air Pollution 1980-1990

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CIRCULATION AND TRANSPORTATION ON STATE HIGHWAYS AND PROVINCIAL ROADS

	Million vehicle-km			Million tons-km			Million passenger-km		
	Total	State Highways	Provincial Roads	Total	State Highways	Provincial Roads	Total	State Highways	Provincial Roads
1982	16595	15086	1509	40567	36879	3688	80010	72736	7274
1983	17260	15690	1570	42189	38354	3835	83690	76082	7608
1984	17949	16317	1632	43878	39889	3989	87539	79581	7958
1985	18667	16970	1697	45634	41485	4149	91567	83243	8324
1986	19824	18022	1802	48463	44057	4406	97609	88736	8873
1987	23016	20924	2092	58832	53484	5348	112034	101849	10185
1988	24443	22221	2222	62480	56800	5680	123236	112033	11203
1989	25983	23621	2362	66416	60378	6038	131001	119092	11909
1990	27041	24583	2458	65710	59736	5974	134991	122719	12272
1991	26056	23687	2369	61969	56335	5634	131089	119177	11912

Source : 1989 and 1991 Statistical Yearbooks of Turkey

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MOTOR VEHICLES BY USE

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Automobile	776 432	811 465	856 350	919 577	983 444	1 087 234	1 193 021	1 309 557	1 434 830	1 649 879	1 864 344
Minibus	66 514	69 598	73 585	80 697	87 951	97 917	106 314	112 883	118 026	125 399	133 632
Bus	33 839	35 432	38 478	43 638	47 119	50 798	53 554	56 172	58 859	63 700	68 973
Pick-up truck	172 269	178 762	186 427	198 106	212 505	224 755	233 480	240 718	248 567	263 407	280 891
Truck	172 372	180 772	190 277	197 721	205 496	217 111	225 872	234 168	241 392	257 353	273 409
Motocycle	160 557	182 795	217 327	256 338	289 052	327 326	369 894	420 891	472 853	531 941	590 488

Source : 1989 and 1991 Statistical Yearbooks of Turkey

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APPENDIX 7

Usage of Pesticides in Cukurova Region

Source: Mr. UNSAL, Usage of Pesticides and PCB in Cukurova region and their impact in the environment - 1992 - Institute of Marine Sciences, Erdemli.

Table 1. Annual usage of pesticides in Çukurova region during the last ten years

Years	ADANA Region			ICEL (MERSIN) Region		
1978	Insecticides*	2,515,526.16	Kg	Insecticides*	1,241,086	Kg
	Fungicides	1,413,708.5	"	Fungicides	1,553,390	"
	Herbicides	206,770	"	Herbicides	21,239	"
	Oils	712,650	"	Oils	920,250	"
	Fumigants	76,605	"	Fumigants	--	
1979	Insecticides*	1,968,939.75	Kg	Insecticides*	571,892.5	Kg
	Fungicides	1,104,803	"	Fungicides	2,357,769	"
	Herbicides	122,090	"	Herbicides	33,550	"
	Oils	400,050	"	Oils	1,288,500	"
	Fumigants	29,580	"	Fumigants	--	
1980**	Insecticides*	2,621,375	Kg	No data available		
	Fungicides	152,520	"			
	Herbicides	444,297	"			
	Oils	231,647	"			
	Fumigants	--				
1981	Insecticides*	2,529,332.52	Kg	Insecticides*	1,606,733	Kg
	Fungicides	737,155	"	Fungicide	1,308,582	"
	Herbicides	254,791	"	Herbicides	113,965	"
	Oils	485,150	"	Oils	1,008,750	"
	Fumigants	18,743.88	"	Fumigants	--	
1982	Insecticides*	1,190,343.5	Kg	Insecticides*	611,747	Kg
	Fungicides	828,368.5	"	Fungicides	1,661,570	"
	Herbicides	237,796	"	Herbicides	101,152	"
	Oils	306,502	"	Oils	676,688.75	"
	Fumigants	23,085.4	"	Fumigants	864,451.1	"
1983	Insecticides*	2,280,698.75	Kg	Insecticides*	1,576,461,7	Kg
	Fungicides	466,753	"	Fungicides	999,516.46	"
	Herbicides	204,784	"	Herbicides	70,760	"
	Oils	296,237	"	Oils	996,000	"
	Fumigants	29,340.65	"	Fumigants	4,685.01	"

Table 1. (Continued)

	Insecticides*	: 4,295,043	Kg	Insceticides*	: 1,943,681	Kg
	Fungicides	: 284,488	"	Fungicides	: 1,318,767	"
1984**	Herbicides	: 346,085	"	Herbicides	: 105,500	"
	Oils	: 333,479	"	Oils	: 1,043,250	"
	Fumigants	: --		Fumigants	: 21,142	"
	Insecticides*	: 2,978,720.05	Kg	Insecticides*	: 1,553,788	Kg
	Fungicides	: 395,497.9	"	Fungicides	: 1,495,855	"
1985	Herbicides	: 525,540	"	Herbicides	: 112,038	"
	Oils	: 148,775	"	Oils	: 799,713	"
	Fumigants	: 26,288.86	"	Fumigants	: --	
	Insecticides*	: 1,598,806.69	Kg	Insecticides*	: 1,625,798	Kg
	Fungicides	: 711,504	"	Fungicides	: 1,227,889	"
1986	Herbicides	: 206,608	"	Herbicides	: 97,190	"
	Oils	: 303,579	"	Oils	: 2,022,711	"
	Fumigants	: 60,371,85	"	Fumigants	: 110,225	"
	Insecticides*	: 2,169,533.44	Kg	Insecticides*	: 1,697,612	Kg
	Fungicides	: 406,716.88	"	Fungicides	: 1,075,968	"
1987	Herbicides	: 257,500	"	Herbicides	: 314,150	"
	Oils	: 338,882	"	Oils	: 2,069,910	"
	Fumigants	: 27,020.7	"	Fumigants	--	

* Insecticides include: Acaricides, Rodenticides, Nematocides, Molluscicides and Bactericides.

** The values of 1980 and 1984 are the total pesticides sold in Adana and its Counties.

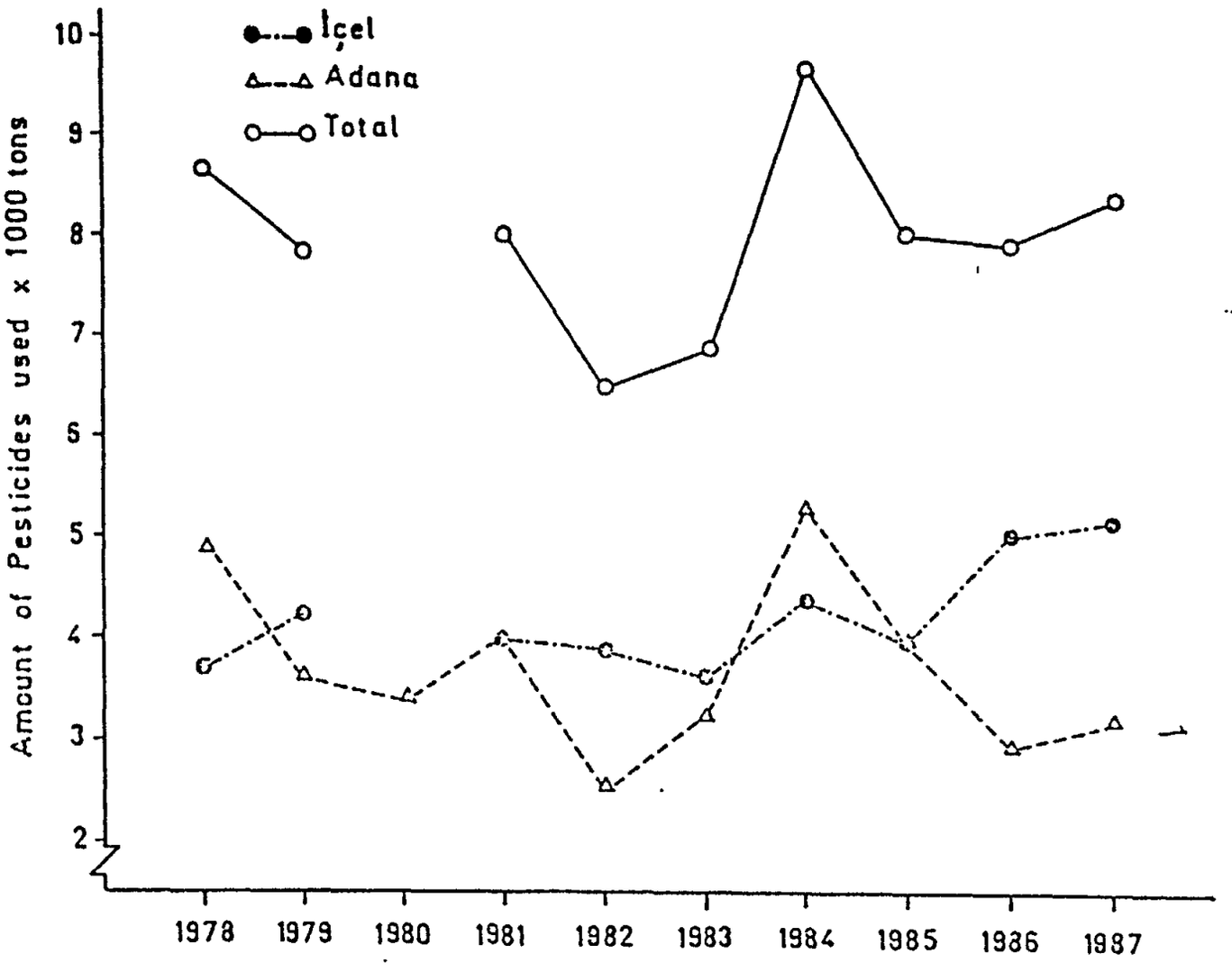

Figure 2. Annual fluctuations of the pesticides used in Çukurova region.

APPENDIX 8

Quelques Reflexions sur les Scenarios Nationaux de la Turquie

novembre 1992

En marge de la révision des hypothèses économiques du Plan Bleu : Quelques réflexions sur LES SCENARIOS NATIONAUX DE LA TURQUIE

J. Royer, Professeur,
CUEPE, Genève

Le texte ci-dessous voudrait brièvement illustrer l'application à la Turquie de la note écrite par l'auteur en septembre 1992, intitulée : "Réflexions sur une révision des hypothèses économiques des scénarios méditerranéens du Plan Bleu", qu'on citera ci-dessous sous le titre « *Royer (sept. 1992)* »

On notera au départ qu'il n'existe pas de contradictions fondamentales entre les nouvelles hypothèses économiques contenues dans la note *Royer (sept. 1992)*, et les scénarios nationaux élaborés par l'Université d'Ankara à propos du projet de la Baie d'Iskenderun, qu'on trouve en annexe du compte rendu de la mission PLAN BLEU (17-24 juin), qu'on citera ci-dessous du nom de son rédacteur, Mme E. Coudert « *Coudert (juin. 1992)*. Il existe pour cette convergence une raison très simple, le fait que ces scénarios nationaux aient été discutés par l'équipe nationale turque avec M. Royer et Mme Coudert à une époque ou la révision des hypothèses économiques du Plan Bleu était déjà écrite pour l'essentiel (édition de juin 1992).

On ne fera donc pas une liste exhaustive des hypothèses économiques qui ferait double emploi avec l'annexe de *Coudert (juin. 1992)*, mais on le complétera sur certains points notamment sur A- **le contexte international** et B- **la politique sociale.** On s'étendra ensuite sur C- **la prospective industrielle** en montrant notamment les inflexions nécessaires dans le scénario fort si l'on veut faire du développement "soutenable".

A- Le Contexte international

Pour la description des conditions régnant sur le marché mondial, qui ne sont qu'esquissées dans *Coudert (juin. 1992)*, on se reportera à *Royer (sept. 1992)*, section 5.

Dans le scénario fort, le rapport *Coudert (juin. 1992)* met l'accent sur la coopération avec les républiques turcophones dans le scénario alternatif. Rien à ajouter sur ce point, excepté que le taux de croissance turc (pour le Plan Bleu, 6 % annuel sur le long terme) suppose *comme première condition* un accès quasiment libre au marché communautaire. Par contraste, le taux faible (pour le Plan Bleu, 3 % annuel sur le long terme) est le reflet, non seulement de la langueur de l'économie mondiale, comme indiqué, mais d'un lien commercial, financier, technologique etc... passablement distendu avec la Communauté. Ce point est capital pour l'industrialisation de la Turquie, et ne préjuge pas de la nature juridique du lien avec la Communauté, mais de sa force.

En ce qui concerne l'intégration au marché mondial, les indications "faible" et "plus forte" trouvées dans [*Coudert (juin. 1992),* dimension "stratégies nationales de développement"] sont un peu sommaires. En réalité, si l'on veut être conséquent, la Communauté mène dans le scénario tendanciel une politique égoïste qui oblige la Turquie à ne négliger aucune possibilité de commerce dans le marché mondial. Au contraire, dans le scénario alternatif, la Communauté finance par des investissements directs une part majeure de la production industrielle et donc absorbe également une proportion notable des exportations turques.

B- **La Politique sociale**

On couvre sous ce vocable l'ensemble des politiques touchant l'inégalité des revenus, entre familles, entre provinces, entre urbain et rural. Relèvent également de ce contexte les politiques d'accès aux services sociaux, y compris l'éducation, la santé, tout ce qui affecte les chances des jeunes dans la société.

La différence d'hypothèses entre les deux scénarios est très simple : l'un, le "tendanciel" sacrifie la politique sociale à la survie du moment; peut-être n'y a-t-il pas d'autre choix pour le gouvernement, mais le résultat pésera inévitablement sur la croissance à long terme. Au contraire, dans le scénario alternatif, les gouvernements successifs sont convaincus qu'il ne saurait y avoir industrialisation et croissance à long terme sans un partage des charges entre tous et donc une attention soutenue aux politiques sociales dans le sens large donné ci-dessus.

C- **La prospective industrielle**

On rappellera ici que l'édition 1988 du Plan Bleu contenait des références explicites au développement industriel de la Turquie. Notamment, le tableau 12 b (édition française, p 103) donnait les multiplicateurs suivants pour un scénario de coopération étroite avec la Communauté :

Tableau 1
Multiplicateurs de la valeur ajoutée industrielle en Turquie

Branches	**1980**	**2000**	**2025**
IAA*	1	1.5	5.9
Industrie lourde**	1	2.3	9.0
Industrie légère	1	3.7	16.1
Machines***	1	4.3	27.9

Source : Plan Bleu, édition 1988, calculs de J. Royer
*IAA = Industries agricoles et alimentaires
** Ind. lourdes = première transformation des produits (chimie lourde, métallurgie) *** Machines = tout équipement, matériel de transport, toutes machines. CTCI 382 + 383 +384.

Ce tableau tend à indiquer que la structure industrielle de la

Turquie devrait se modifier dans l'avenir de manière inégale suivant les secteurs : dans l'ordre croissant, le secteur des Industries agricoles et alimentaires aurait la croissance la plus faible (multiplicateur 1.5 en 2000), puis l'Industrie lourde (2.3 en 2000), les croissances les plus rapides étant promises à l'industrie légère (3.7 en 2000) et surtout celle des machines, y compris les véhicules (4.3 en 2000, 27.9 en 2025).

Que peut-on dire à ce sujet au vu des dernières performances de l'industrie turque ? On dit dans *Royer (sept. 1992),* que la Turquie, par son dynamisme industriel, compte parmi les candidats potentiels au statut de pays à industrialisation rapide. Il est bien vrai qu'en 1990, la production industrielle, mesurée par la valeur ajoutée manufacturière (VAM), fait de la Turquie le premier pays industriel parmi les PSEM : La VAM, en dollars courants y atteint 23 millions en 1990, contre 5,5 millions en Egypte, et 12 millions au Maghreb.

Le tableau ci-dessous fait une comparaison osée entre Turquie et République de Corée, deux pays qui différent en bien des points, mais où, précisément, la dynamique industrielle est forte. On notera que les populations respectives des deux pays, en 1990, sont approximativement de 42 millions (Corée) et 55 millions (Turquie), donc grossièrement dans une même catégorie de pays peuplés autour de 50 millions d'habitants.

Tableau 2
Comparaison des structures industrielles Turquie-Corée
(valeur ajoutée en millions de dollars courants)

Branches	**Turquie**	**Corée**	
	1990	**1980**	**1990**
Total Manufacturés	22930	18460	44460
Mul	*1*	*0.8*	*1.9*
Dont:			
IAA*	1880	1526	4693
Mul	*1*	*0.8*	*2.5*
Chimie**	2860	2014	6480
Mul	*1*	*0.7*	*2.3*
Fer/Acier***	1759	1256	5297
Mul	*1*	*0.7*	*3.0*
Non Ferreux***	491	295	1270
Mul	*1*	*0.6*	*2.6*
Machines****	3100	3410	23680
Mul	*1*	*1.1*	*7.6*

Source : Industrie et développement dans le Monde, 1991-1992, annexe.
Les calculs de multiplicateurs sont ceux de J. Royer
*IAA = Industries agricoles et alimentaires, boissons et tabac exclus
** Chimie = CTCI N°351+352 *** Fer/acier = CTCI N° 371, Non Ferreux = CTCI 372 ****Machines = CTCI N° 382 + 383 +384.

Ce tableau suggère que la puissance industrielle de la Turquie de 1990 se compare à celle de la Corée quelque part entre 1980 et 1985; ceci

s'applique à la valeur ajoutée manufacturière totale, et aussi à l'IAA, à la chimie, à la sidérurgie et aux non-ferreux, pour lesquels l'industrie Coréenne de1980 se situait à environ 60-80 % de l'industrie turque de 1990; mais pour l'industrie des machines, la Corée était déjà en 1980 légèrement au dessus de la Turquie (multiplicateur 1.1). Les multiplicateurs "Turquie/Corée 1990" suggèrent que, si la Turquie prend la voie de l'industrialisation de la Corée, elle devra pousser davantage la croissance de l'industrie lourde (chimie, sidérurgie, métallurgie des non-ferreux, avec des multiplicateurs de 2.3 à 3) par rapport aux Industries agricoles et alimentaires (multiplicateur 2.5), et encore plus, beaucoup plus, celle des machines (multiplicateur 7.8). Ces chiffres confirment bien la direction des prévisions faites en 1988. On peut montrer sur quelques cas concrets les orientations qu'on peut en tirer.

Engrais. La Turquie est un producteur, un exportateur et un consommateur important : au 20ème rang pour la production (725 mille t) et au 8ème rang pour les importations d'engrais azotés; au 12ème rang pour la production d'engrais phosphatés (634 mille t) et au 9ème rang pour les exportations de cette catégorie (257 mille t); au 15ème rang pour les consommations d'engrais toutes catégories. Dans le classement des sociétés, la Turquie contient la troisième société, par importance, parmi les pays du sud (Turkish Fertilizer Industry Co. TUSAS).

Les prévisions de croissance pour l'industrie mondiale des engrais sont moroses, en raison du plafonnement des superficies cultivées dans le nord, d'une part, et également à cause de l'attention accordée par des pays toujours plus nombreux à la diminution des doses d'engrais dans un souci de limiter la pollution des sols et des eaux. Il y a donc de bonnes chances de penser que la production d'engrais croîtra en Turquie essentiellement pour la demande nationale.

Acier brut. La Turquie se place au 19ème rang des producteurs mondiaux, avant le Mexique, l'Afrique du sud, l'Australie, mais juste après Taiwan et loin derrière la Corée (7ème). Les perspectives de l'industrie turque sont décrites comme suit dans le dernier rapport de l'ONUDI (voir la Source du tableau 2, page 358 de l'édition française) :

« L'intention déclarée des grands constructeurs d'automobiles d'implanter des usines d'assemblage en Turquie a incité les principaux maîtres de forge à élargir la gamme de leurs produits afin de répondre à cette demande potentielle. C'est ainsi qu'Iskenderun envisageait la possibilité de construire une usine de brames minces afin de pouvoir s'engager dans le secteur des tôles. La technologie proposée viendrait d'Autriche. »

Ainsi, la grande poussée industrielle à venir serait, dans le domaine de l'acier, une conséquence de l'implantation d'usines d'assemblage, autrement dit d'un saut qualitatif dans l'industrie des machines. Cette remarque peut s'étendre à de nombreuses branches industrielles, qui recevrait une impulsion décisive de la création d'usines d'assemblage étrangères amenant la technologie et de nouvelles exigences industrielles. Ceci s'appliquerait au premier chef au secteur suivant :

Fonderies. La Turquie, au 15ème rang mondial, traitait environ 600 mille tonnes dans ses fonderies en 1990. Ce secteur possède des capacités excédentaires et la concurrence y est vive. La pression qui en résulte fait évoluer très vite les technologies. Citons deux innovations parmi beaucoup d'autres : l'utilisation de matériaux nouveaux, l'apparition de manufacture "presque sur mesure" (near net-shape) de pièces moulées. Dans ce domaine, la mutation à effectuer appelle en quelque sorte une demande exigeante en provenance d'usines d'assemblages modernes.

Produits chimiques. Les usines turques sont issus de fonds publics et on peut s'attendre dans un avenir proche à des tentatives de restructuration après privatisation. Le domaine, ici encore, est en pleine mutation technologique, dont on se contentera de donner deux exemples : d'une part, la tendance est à la recherche de polymères biodégradables, sous la pression des milieux écologistes. D'autres part, l'industrie des matériaux composites est en plein essor, poussé par des industries telles que l'aérospatiale : composites à matrice polymère ou à matrice métallique de plus en plus utilisés dans des usines d'assemblage. L'industrie turque se trouve donc devant le défi de s'adapter et le fera d'autant mieux qu'elle sera reliée au marché mondial par l'intermédiaire de milieux - notamment européens- susceptibles de lui amener des technologies.

Conclusion sur l'industrialisation

Il paraît inutile de multiplier les exemples pour montrer que *volens, nolens*, l'industrialisation de la Turquie appelle une mutation qui cumule plusieurs caractéristiques :

- L'industrie lourde actuelle, en Turquie est à la fois surdimensionnée par rapport à l'industrie mécanique et électrique, et surtout elle doit subir une novation technologique.
- On a donc toute chance de voir se produire, comme on le prévoyait déjà dans le Plan Bleu 88, une poussée rapide des industries d'équipement et de machines qui créera le supplément de demande nationale attendu par l'industrie lourde (chimie, métallurgie).
- Ce serait un grand avantage pour la Turquie si ces investissements dans l'industrie d'équipement amenait, non seulement des capitaux neufs, mais aussi une technologie de l'étranger. C'est pourquoi on doit associer ce développement, si l'on veut qu'il soit rapide, à des politiques d'insertion dans le marché mondial, et au premier chef, d'association avec la Communauté (scénario alternatif).
- Bien entendu, une telle politique appelle un effort national particulier de recherche et développement, et, pour commencer, la formation accrue d'ingénieurs et de scientifiques.

Corollaire pour la zone d'Iskenderun : essayer de devancer le mouvement de croissance de l'industrie mécanique et électrique, plutôt que d'accroître sa dépendance vis à vis des industries lourdes, mais aussi encourager la restructuration des industries locales, et d'abord de la sidérurgie d'Izdemir.

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