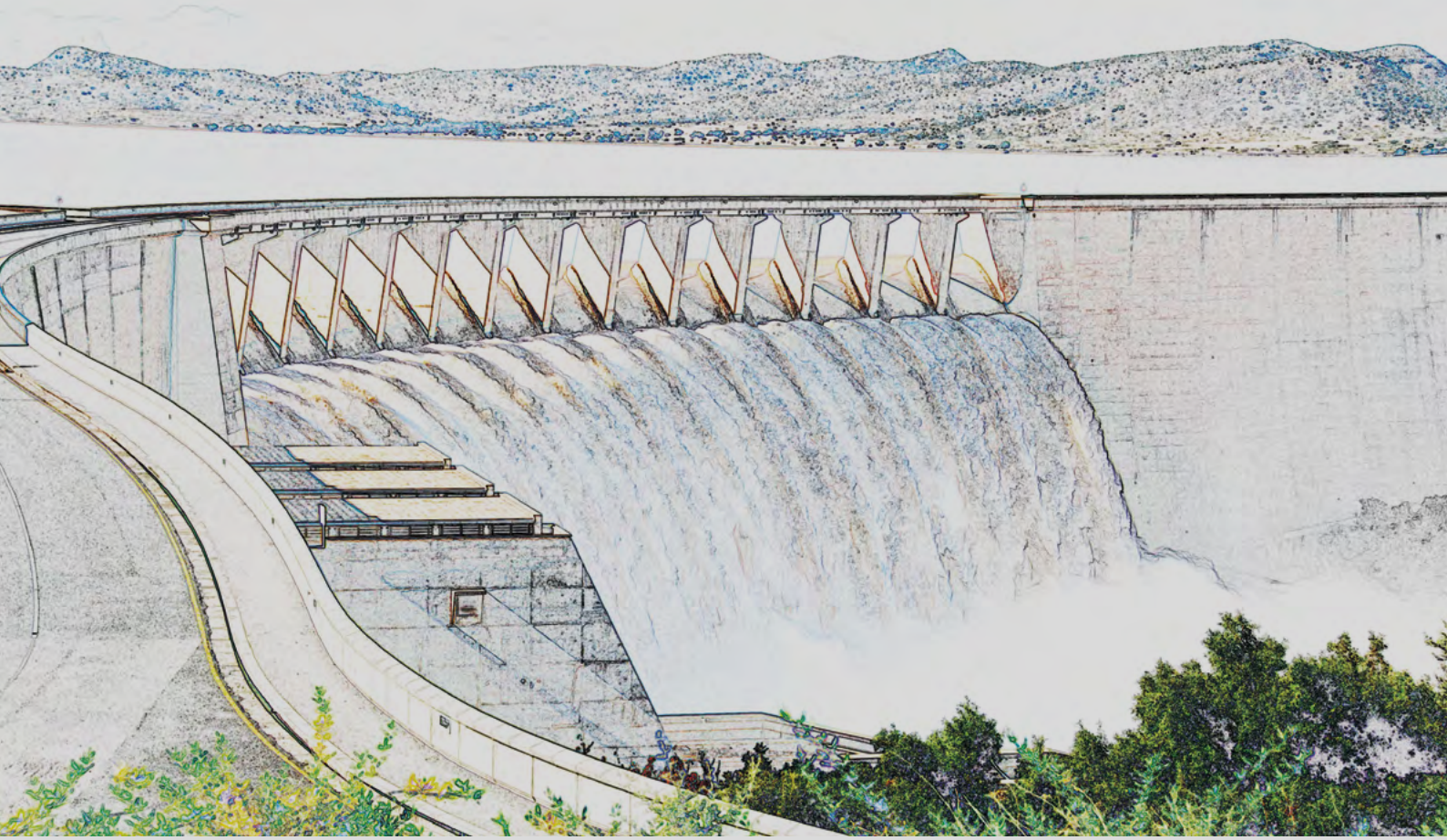


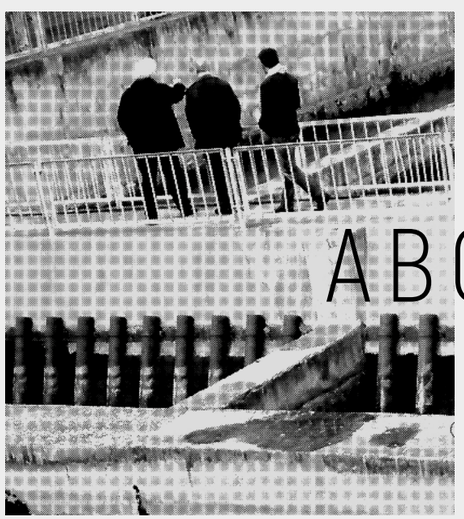
DAM and IRRIGATION/DRINKING WATER
DAM BREAK ANALYSES
Dams
Irrigation Network
Drinking Water Transmission System
Feasibility •
Planning and Preliminary Design •
Final Design •

FLOOD CONTROL/PROTECTION and CHANNEL IMPROVEMENT
Planning and Preliminary Design •
Final Design •

BASIN PLANS
- River Basin Management Plans
- Basin Drought Management Plans
- Basin Sectoral Water Allocation Plans
- Basin Flood Risk Management Plans (FRMP)
- Basin Master Plans
- Basin Hydrogeology (Groundwater) Plans

ENERGY
- HEPP Feasibility Reports
- Climate Change Effects





ABOUT US

Founded by FAYİK TURAN, nfb is committed to providing high quality services to public and private sector organizations and institutions in the field of engineering and consulting. NFB Engineering and Consultancy offers comprehensive solutions on Energy, Irrigation and Drainage, Flood Control and Protection and Drinking - Potable Water Supply and Urban Infrastructure consultancy, feasibility and final design services with its trained personnel.

HaPP

BASIN SCALE WATER ALLOCATION and RESERVOIR PLANNING PROGRAM

The Basin Planning Program (DSI-HaPP), an innovative decision support system (DSS) tool for Planning And Development of Water Resources Impacted by Increasing Water Demand and Climate Change.

The Basin Planning Program (DSI-HaPP) has recently been approved to be used in the planning studies carried out by DSI (State Hydraulic Works of Türkiye).

Planning of water resources systems with Basin Planning Program (DSI-HaPP) is providing more accurate solutions to the user and speeding up the decission process in multi-resevoir operations and water allocation optimizations. A generic, user friendly and robust basin optimization toolbox is simulating water allocations for multi-objective multi-reservoirs with evolutionary optimization algorithms.

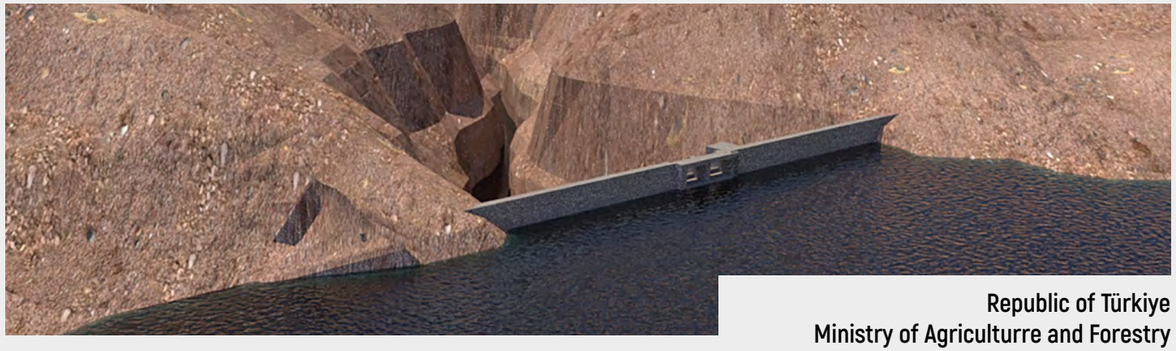
Purposes such as energy, drinking water, irrigation, and ecological water allocations as well as reservoir volume, flood level and turbine installed capacity optimizations can be succeeded in HaPP.

DSİ - HaPP

WATER SUPPLY
DAM and IRRIGATION/DRINKING WATER

MALATYA-DARENDE KAYNARCA DAM PLANNING and ENGINEERING SERVICES

The objective of the project is to carry out planning and preliminary design studies of Kaynarca Dam for the purpose of drinking water, irrigation and energy.
Within the scope document called as "Instructions for Determination of Project Principles" was updated and another document to be used as "Planning Report Guide" was developed.
Additionally, Generic Dam/Weir Operation Optimization Tool (DSİ-HaPP) to be used in basin wide feasibility and planning studies by State Hydraulic Works (DSI), Türkiye is developed by NFB company managing director Dr. Burak Turan.
The tool will be used to optimize the dam/weir structures' operations for the purposes of drinking/irrigation water, energy generation, normal water elevation, flood, and etc. The tool will be used during decision making processes. The tool can optimize only one purpose as well as multi purposes and one or several dam/weir facilities located in a basin.
The tool is developed with "C#" programming language and integrates "R" language as well. It utilizes Non-Linear Particle Swarm and Genetic optimization algorithms. It can provide Pareto sets to the user in order to show the trade off among different purposes. It has parallel-computing capability so that the user can have outputs faster as all of the processors can be used at the same time for the computation.



Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
9th Regional Directorate, Elazığ

WATER SUPPLY
DAM and IRRIGATION/DRINKING WATER

TOKAT TURHAL ÇİVRİL DAM AND IRRIGATION AND TOKAT TURHAL BAHÇEBAŞI DAM AND IRRIGATION PLANNING AND PRELIMINARY DESIGN ENGINEERING SERVICES

Purpose of the study is to prepare feasibility and preliminary design projects for five dams in order to provide irrigation water to agricultural lands in City of Tokat, Türkiye.

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
7th Regional Directorate, Samsun

2nd REGION GÖLSU UŞAK PROJECTS WATER SUPPLY AND IRRIGATION & DOKUZSELE CREEK PLANNING AND FINAL DESIGN PROJECT

Purpose of the study was to prepare feasibility and final design projects for five dams in order to provide irrigation water to agricultural lands in City of Uşak, Türkiye. In addition channel improvement projects were completed for 8-km long Dokuzsele Creek in the center of city of Uşak. All necessary hydrological, water resources management, hydraulic and design studies were completed for the structures and pipeline within the scope of the project.

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
2th Regional Directorate, İzmir

WATER SUPPLY

DAM and IRRIGATION/DRINKING WATER

KÜÇÜKKUYU - DİKİLİ COASTLINE WATER SUPPLY PLANNING AND PRELIMINARY DESIGN PROJECT

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
25th Regional Directorate, Balıkesir

WATER SUPPLY
DAM and IRRIGATION/DRINKING WATER

CITY OF İZMİR DRINKING WATER SUPPLY PROJECT BAŞLAMIŞ DAM PLANNING AND PRELIMINARY DESIGN PROJECT ENGINEERING SERVICES

ADDITIONAL WATER SUPPLY TO İZMİR BEYDAĞ DAM PLANNING (FEASİBİLİTY) AND FINAL DESIGN PROJECT ENGINEERING SERVICES

ASSESSMENT OF WATER LEAKAGE FROM MANİSA GÖRDES DAM PLANNING AND FINAL DESIGN PROJECT

İZMİR KEMALPAŞA ARMUTLU DAM AND IRRIGATION PLANNING ENGINEERING SERVICES

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
2th Regional Directorate, İzmir

WATER SUPPLY
DAM and IRRIGATION/DRINKING WATER

PREPARATION OF FEASIBILITY STUDIES AND DESIGN DOCUMENTS FOR THE RESTORATION AND DEVELOPMENT OF THE WATER MANAGEMENT FACILITIES OF LAÇIN VE KELBECER DISTRICTS

Azerbaijan Amelioration and Water Farm Open Joint Stock Company
Azerbaijan

LOT 1: PREPARATION OF TECHNICAL AND ECONOMIC REPORTS OF TÜRYANÇAY DAM AND RESERVOIR

Azerbaijan Amelioration and Water Farm Open Joint Stock Company
Azerbaijan

DAM
BREAK (BREACH) ANALYSES

TÜRKİYE IRRIGATION MODERNIZATION PROJECT DAM SAFETY CONSULTANCY SERVICES

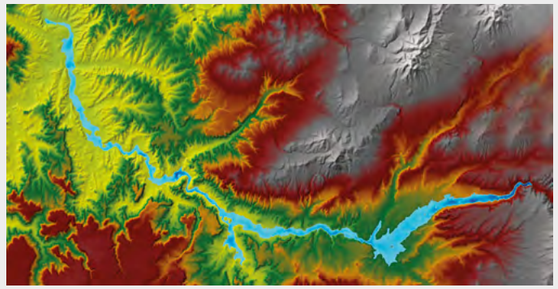
Türkiye
DSİ (State Hydraulic Works of Türkiye)
World Bank

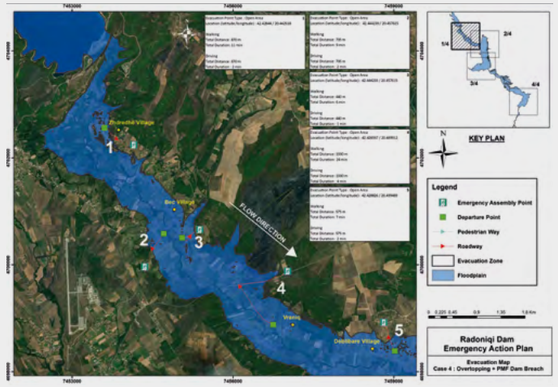
EMERGENCY PREPAREDNESS PLAN & HYDROLOGİC ANALYSES FOR RADONIQI DAM

Republic of Kosovo
Ministry of Agriculture, Forestry and Rural Development

SINGROBO - AHOUATY HYDROPOWER PLANT DAM BREAK STUDY

Tractebel Hidro Dizayn Mühendislik A.Ş.
Ivory Coast





BASIN PLANS
RIVER BASIN MANAGEMENT PLANS

TECHNICAL ASSISTANCE ON PREPARATION OF RIVER BASIN MANAGEMENT PLANS FOR 6 BASINS
(EuropeAid/140294/IH/SER/TR)

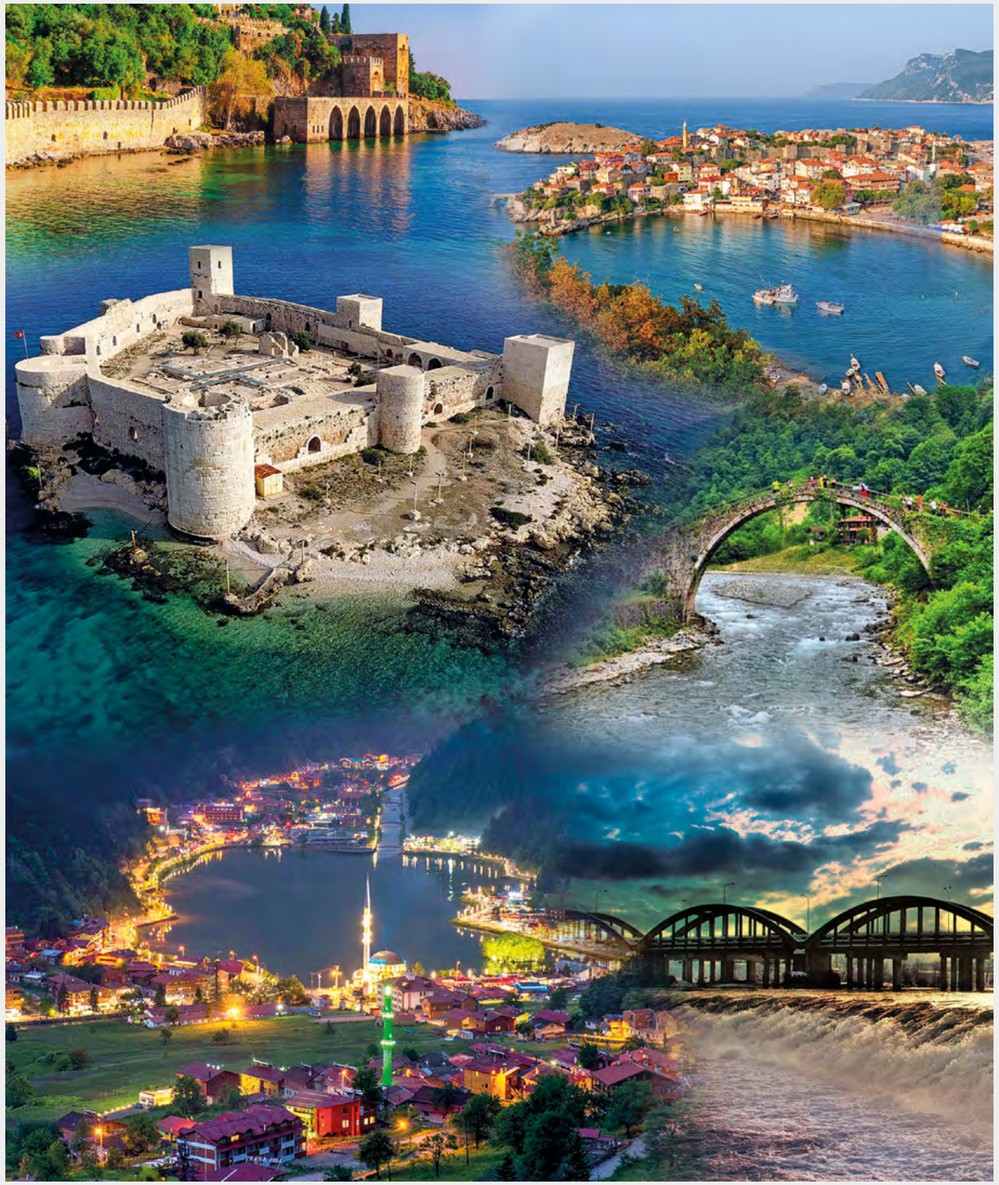
ANTALYA, BATI KARADENİZ, DOĞU AKDENİZ, DOĞU KARADENİZ, KIZILIRMAK and MARMARA BASINS

CONTRACTING AUTHORITY
General Directorate of European Union and Foreign Relations, Ministry of Environment and Urbanization, Ankara, Türkiye

BENEFICIARY
Republic of Türkiye, Ministry of Agriculture and Forestry, Directorate General of Water Management

Within the scope of the project RBMPs for Antalya, Batı Karadeniz, Doğu Karadeniz, Doğu Akdeniz, Kızılırmak and Marmara Basins are prepared in compliance with the WFD, daughter directives and national circumstances. This comprises basically the elaboration of the followings:

- Characterisation Reports
- Sectoral Water Allocation Plans (SWAPs)
- Reports on the Significant Water Management Issue (SWMIs)
- Monitoring Reports
- Reports on the Environmental Objectives
- Reports on the Programme of Measures
- Reports on the River Basin Management Plan (RBMPs)



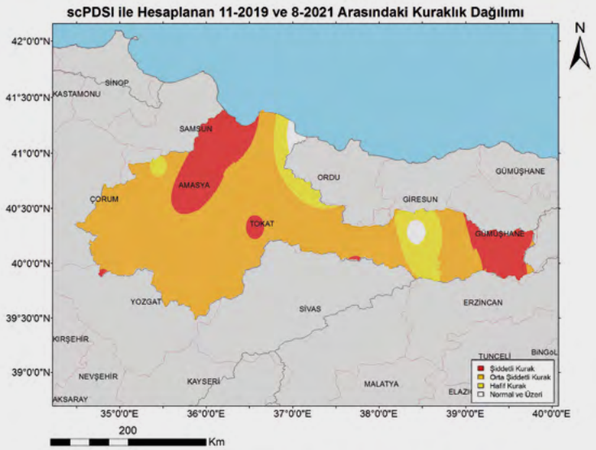
BASIN PLANS
BASIN DROUGHT MANAGEMENT PLANS

Republic of Türkiye
Ministry of Agriculturre and Forestry
Directorate General of Water Management

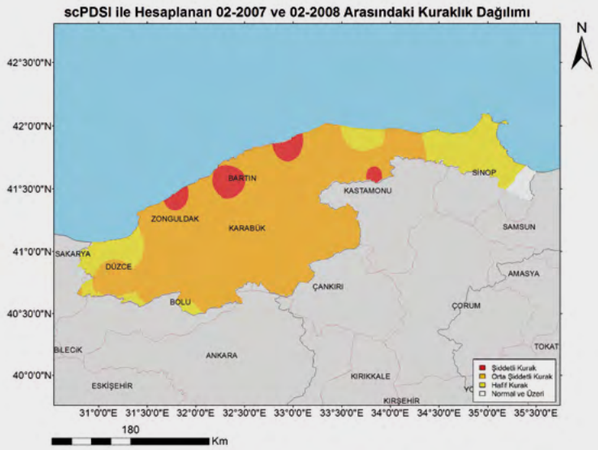
YEŞİLIRMAK and BATI KARADENİZ BASINS DROUGHT MANAGEMENT PLAN

SAKARYA and SUSURLUK BASINS DROUGHT MANAGEMENT PLAN

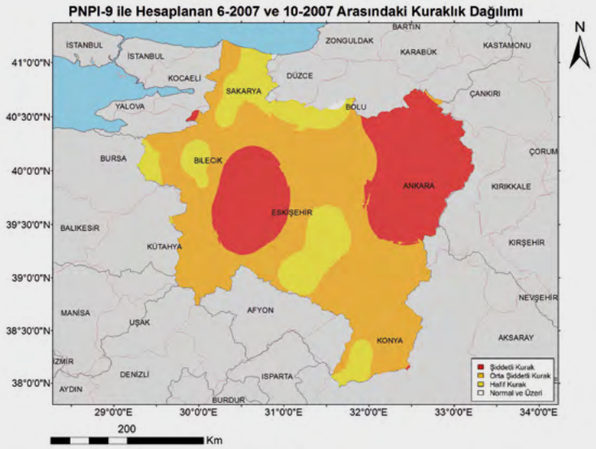
Within the scope of basin drought management plans, drought analyzes were carried out, drought hazard maps were developed, water budget was estimated, sectoral vulnerability analyzes were completed, and mitigation measures were determined.



YEŞİLIRMAK BASIN



BATI KARADENİZ BASIN



SAKARYA BASIN

SUSURLUK BASIN

BASIN PLANS
SECTORAL WATER ALLOCATION PLANS

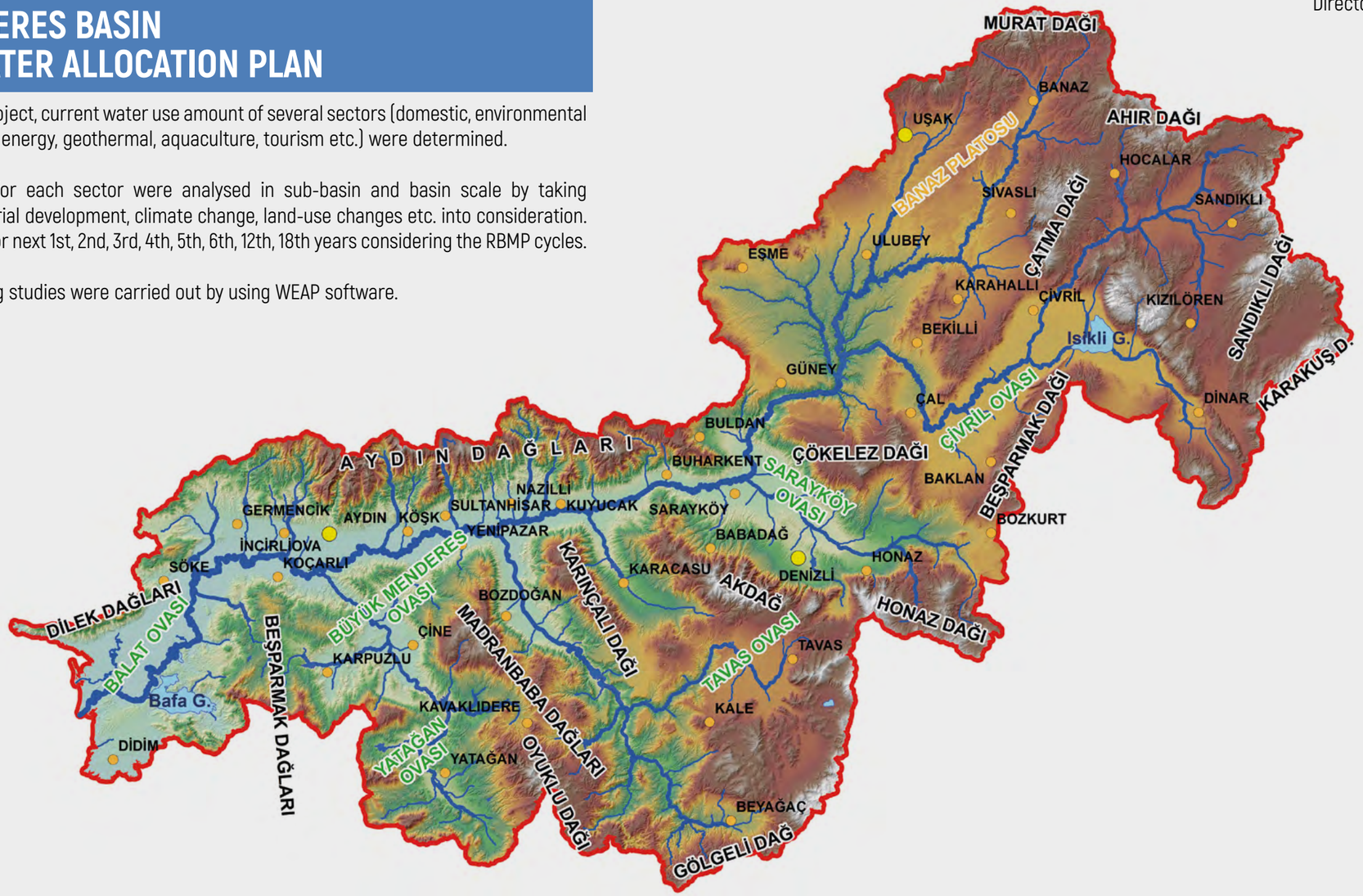
BÜYÜK MENDERES BASIN SECTORAL WATER ALLOCATION PLAN

Within the scope of the project, current water use amount of several sectors (domestic, environmental flow, agriculture, industry, energy, geothermal, aquaculture, tourism etc.) were determined.

Future water demands for each sector were analysed in sub-basin and basin scale by taking population growth, industrial development, climate change, land-use changes etc. into consideration. The projections covered for next 1st, 2nd, 3rd, 4th, 5th, 6th, 12th, 18th years considering the RBMP cycles.

Water Allocation Modelling studies were carried out by using WEAP software.

Republic of Türkiye
Ministry of Agriculturre and Forestry
Directorate General of Water Management



DEVELOPING BULK WATER SUPPLY MASTER PLAN and WATER HARVESTING MASTER PLAN in WEST BANK

The project aims supporting the Palestinian Water Authority (PWA) in (1) developing Bulk Water Master Plan and preliminary design of regional clusters, and (2) developing Water Harvesting Master Plan in West Bank.

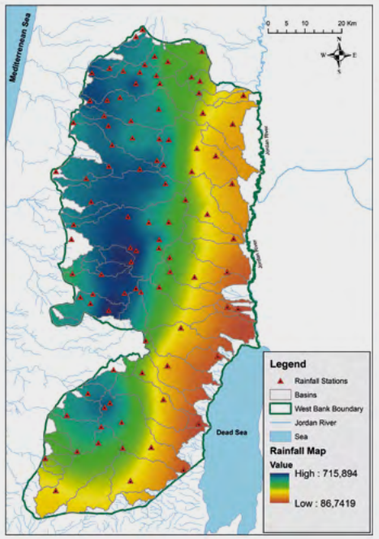
Bulk Water Master Plan and Preliminary Design of Regional Cluster

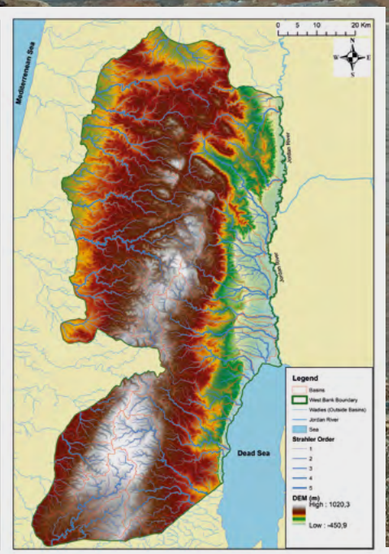
- Hydraulic model simulation for drinking water pipeline,
- Preliminary design of priority regional clusters including work packages and project summary documentation,
- Environmental and Social Management Framework.

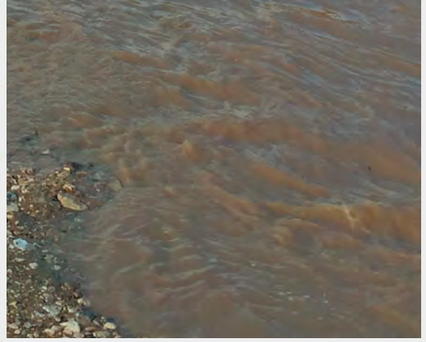
Water Harvesting Master Plan

- Conceptual model and groundwater balance of the main aquifers, review of relevant studies,
- Development of hydrological models (HEC-HMS) and technical solutions,
- Development of master plan that includes global water harvesting potential (including a map), most suitable harvesting techniques, potential projects, recommendations about applicable management system,
- Environmental and Social Management Framework,
- Development of plans to reuse of treated wastewater in irrigation.

Palestine
Water Authority







BASIN PLANS
BASIN MASTER PLANS

SAKARYA BASIN MASTER PLAN REPORT

KUZEY EGE BASIN MASTER PLAN REPORT

Within the scope of Basin Master Plan studies;

Water potential of the basins has been determined,

River Basin and Water resources management was succeeded in the project by activity of planning, developing, distributing and managing the optimum use of water resources,

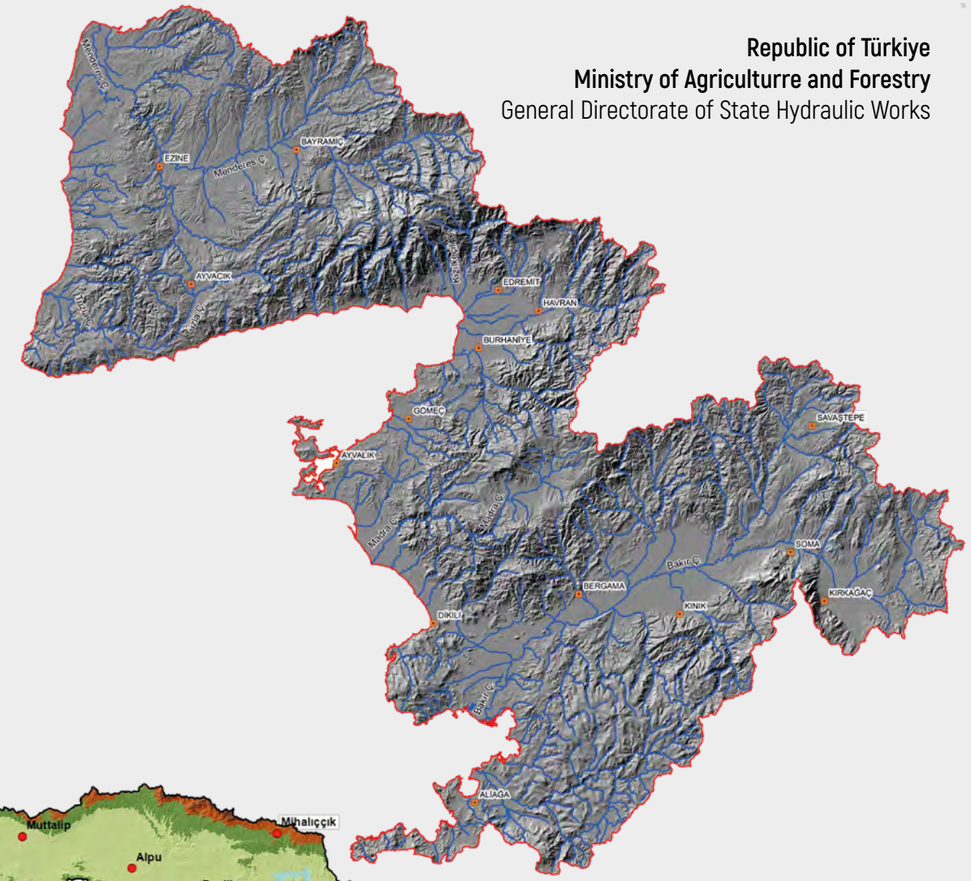
Environmental impact assessment was carried out by covering calculation of minimum ecological flows, detection of natural lakes and water bodies, natural and historical sites, natural parks, existing water supply sources (surface and groundwater) and protected areas such as reservoirs of potable water supply schemes,

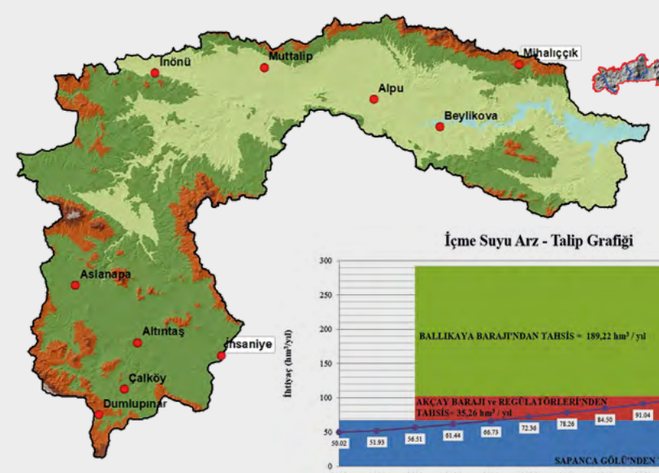
Flood Risk Analysis was carried out by covering determination of flood prone areas. 1-D hydraulic modelling was carried out and flood inundation maps were developed.

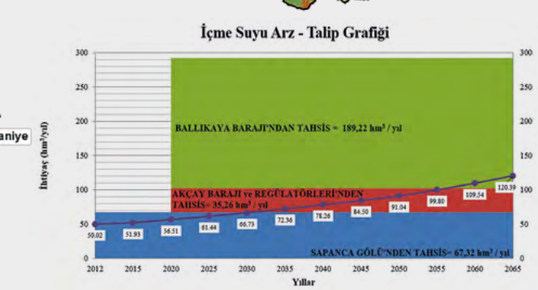
Sediment transport analysis was carried out by using Gavrilovic method. Existing sediment control structures were evaluated and new facilities proposed.

Inventory of all existing hydropower projects under operation, construction, design and feasibility stage were prepared. New hydropower plants were proposed.

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works





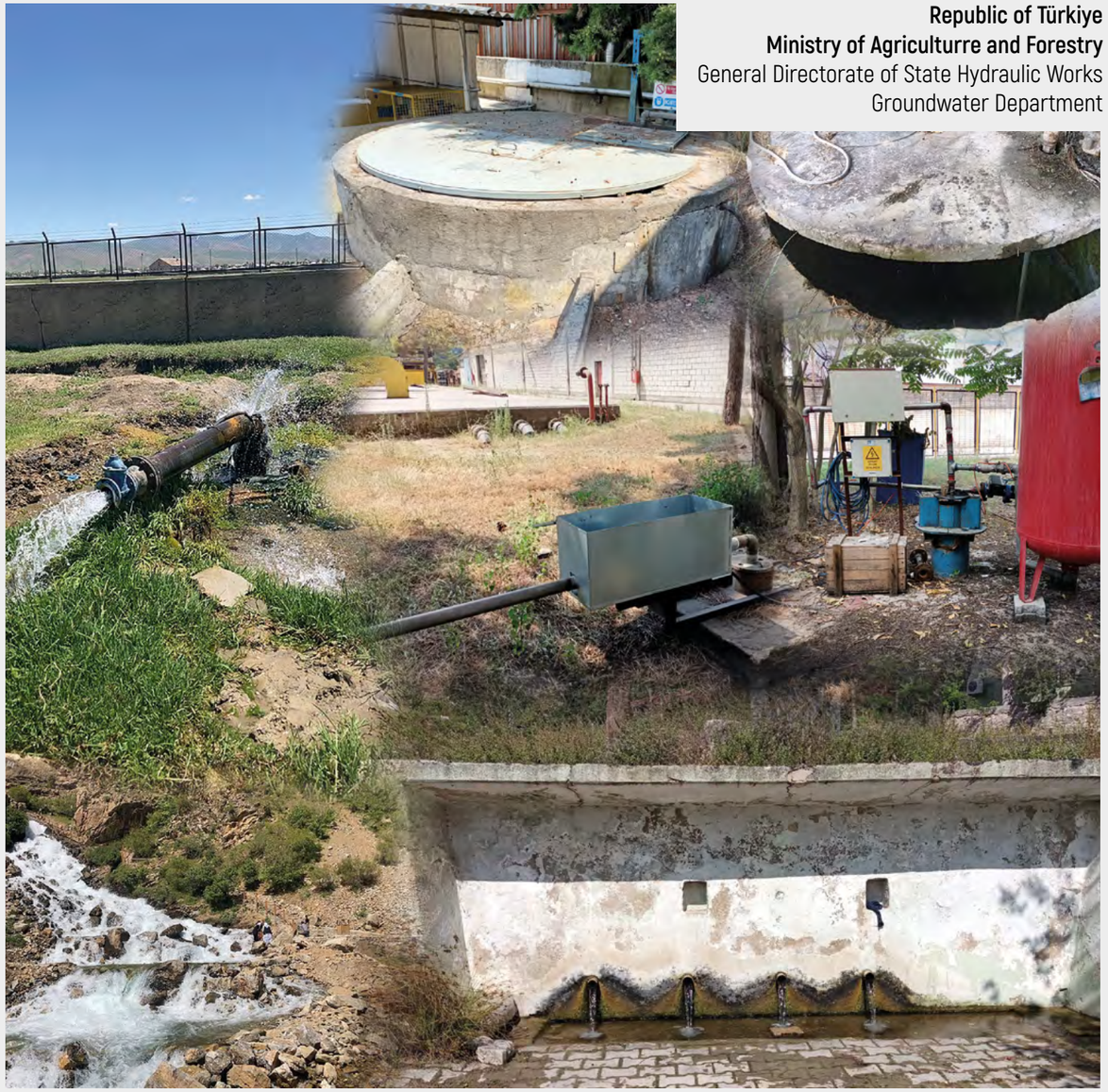


BASIN PLANS
BASIN GROUNDWATER PLANNING (HYDROGEOLOGICAL FEASIBILITY)

DİCLE BASIN GROUNDWATER PLANNING (HYDROGEOLOGICAL FEASIBILITY) REPORT

MARMARA BASIN GROUNDWATER PLANNING (HYDROGEOLOGICAL FEASIBILITY) REPORT

Within the scope of the project, hydrogeological structure of groundwater was investigated in the basin , groundwater budget was calculated for sub-basins and basin and field activities were carried out in order to monitor groundwater quality and quantity in line with relevant by-laws.



Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
Groundwater Department

BASIN PLANS
BASIN FLOOD RISK MANAGEMENT PLANS (FRMPs)

SUSURLUK BASIN
UPDATE OF BASIN FLOOD RISK MANAGEMENT PLAN

KUZEY EGE, GEDİZ and KÜÇÜK MENDERES BASINS
FLOOD RISK MANAGEMENT PLANS

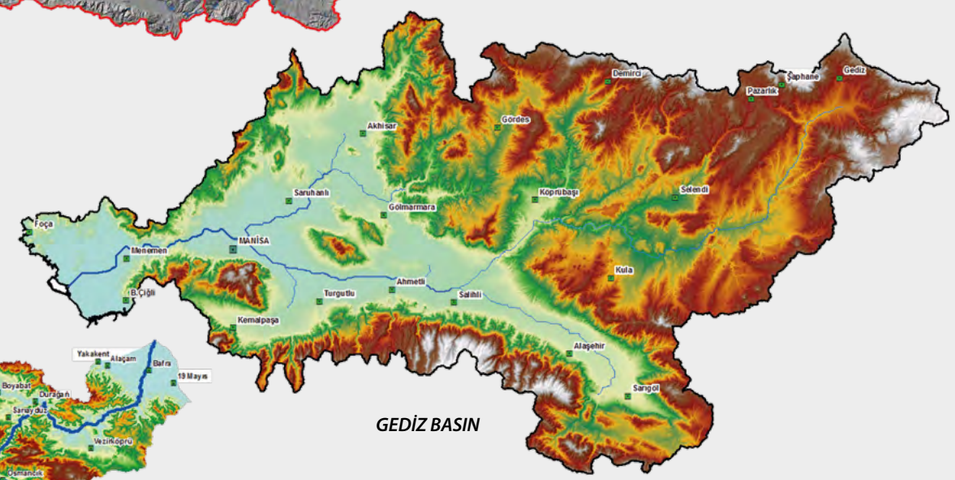
KIZILIRMAK BASIN
FLOOD RISK MANAGEMENT PLAN

Flood Risk Management Planning aims to determine the flood prone areas in the basin and propose mitigation measures to reduce negative effects of floods on human health, environment, cultural heritage and economic activities.

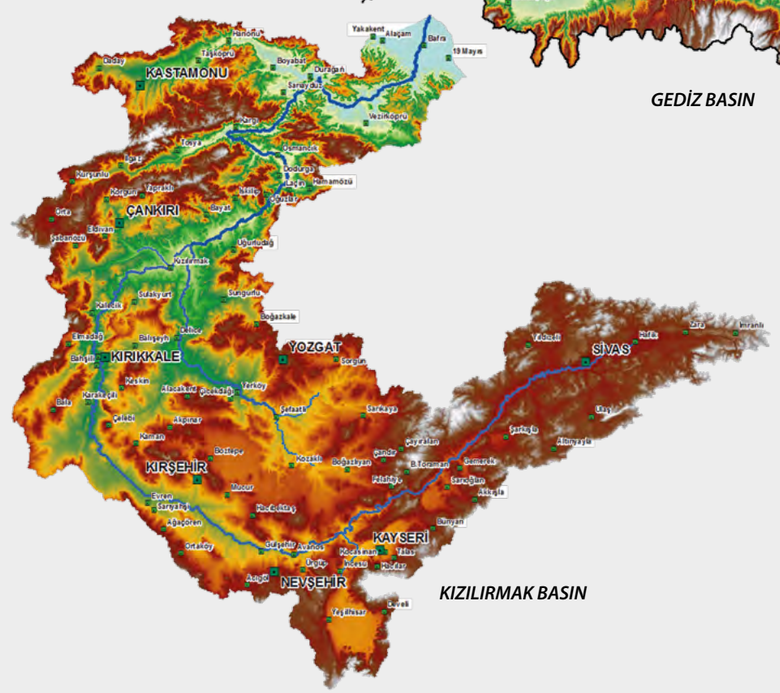
Within the scope of FRMPs, hydrological and 1d/2d hydraulic modelling studies are carried out, flood inundation, hazard, risk and evacuation maps are developed, structural and non-structural measures are proposed and cost analyzes for the measures are estimated.

SUSURLUK BASIN

Republic of Türkiye
Ministry of Agriculturre and Forestry
Directorate General of Water Management



GEDİZ BASIN



KIZILIRMAK BASIN

FLOOD CONTROL and PROTECTION
EROSION MAPPING and CHANNEL IMPROVEMENT

TECHNICAL ASSISTANCE for PREPARATION of EROSION PROTECTION PLANS and TECHNICAL DESIGN DOCUMENTATION for FLOOD-PROTECTING INFRASTRUCTURE for SELECTED PRIORITY AREAS in BOSNIA and HERZEGOVINA (EuropeAid/140327/DH/SER/BA)

Scope of the Project;

- To develop erosion protection plans for FBiH and BD,
- To develop complete technical design documentation for flood-protecting infrastructure for the selected priority sections of the River Sava and Adriatic watersheds in RS

  Regulation of the River Bosnia in Modrica and Vukosavlje Municipalities

  Development of Conceptual and Main Design for Drainage of Petrovo Polje

  Development of Conceptual and Main Design for Recovery and Reconstruction of Channel Network in Ivanjsko polje and Lijevce polje

  Development of Conceptual and Main Design of the Regulation of Drina and Cehotina Rivers in Urban Part of Foca Municipality

European Union
Delegation to
Bosnia and Herzegovina

FLOOD CONTROL and PROTECTION
CHANNEL IMPROVEMENT

DOKUZSELE CREEK CHANNEL IMPROVEMENT FEASIBILITY and FINAL DESIGN PROJECT

Republic of Türkiye Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works 2nd Regional Directorate, İzmir

13th REGION CHANNEL IMPROVEMENT and SEDIMENT CONTROL PROJECT

Republic of Türkiye Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works 13th Regional Directorate, Antalya

PREPARATION of BALIKESİR GÖNEN and AYVALIK NİKİTA CREEKS DETAILED DESIGN FLOOD and SEDIMENT CONTROL REPORT

Republic of Türkiye Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works 25th Regional Directorate, Balıkesir

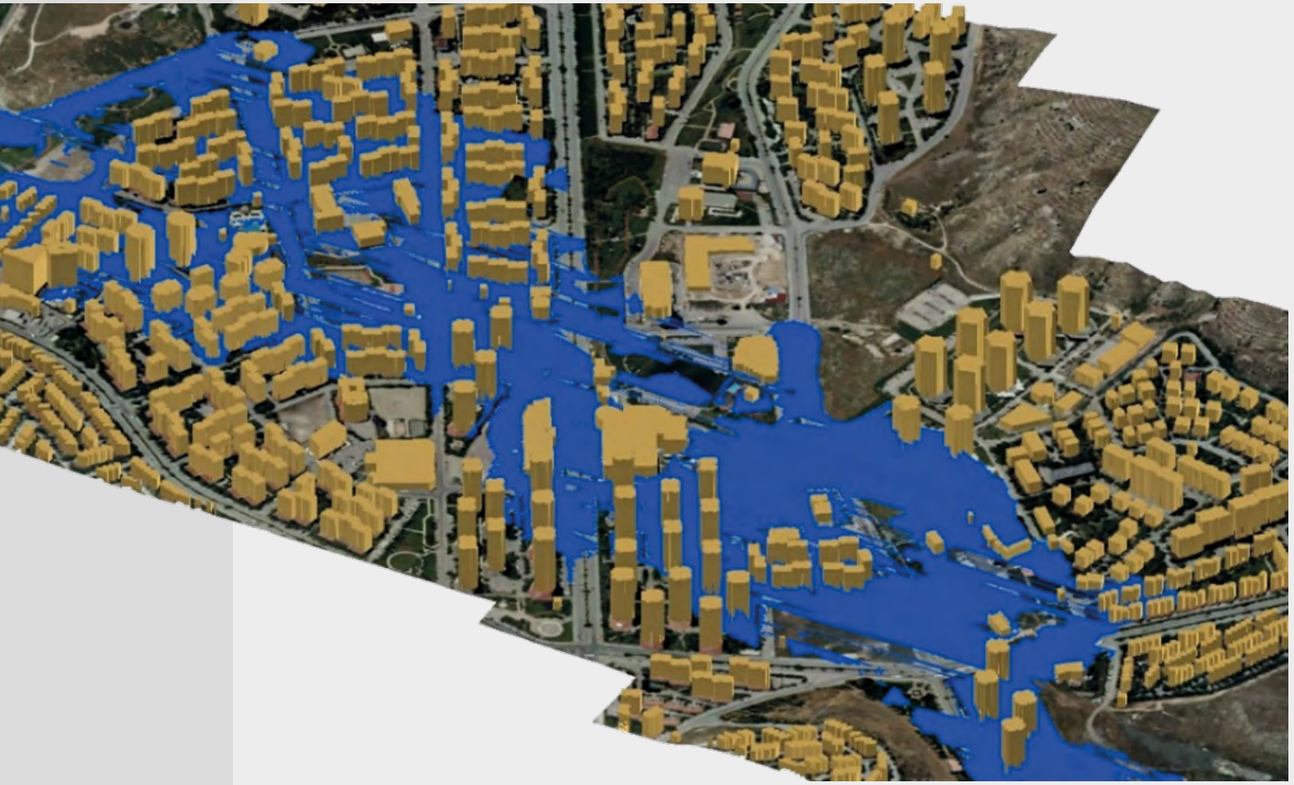
KIZILIRMAK RIVER IMPROVEMENT PROJECT

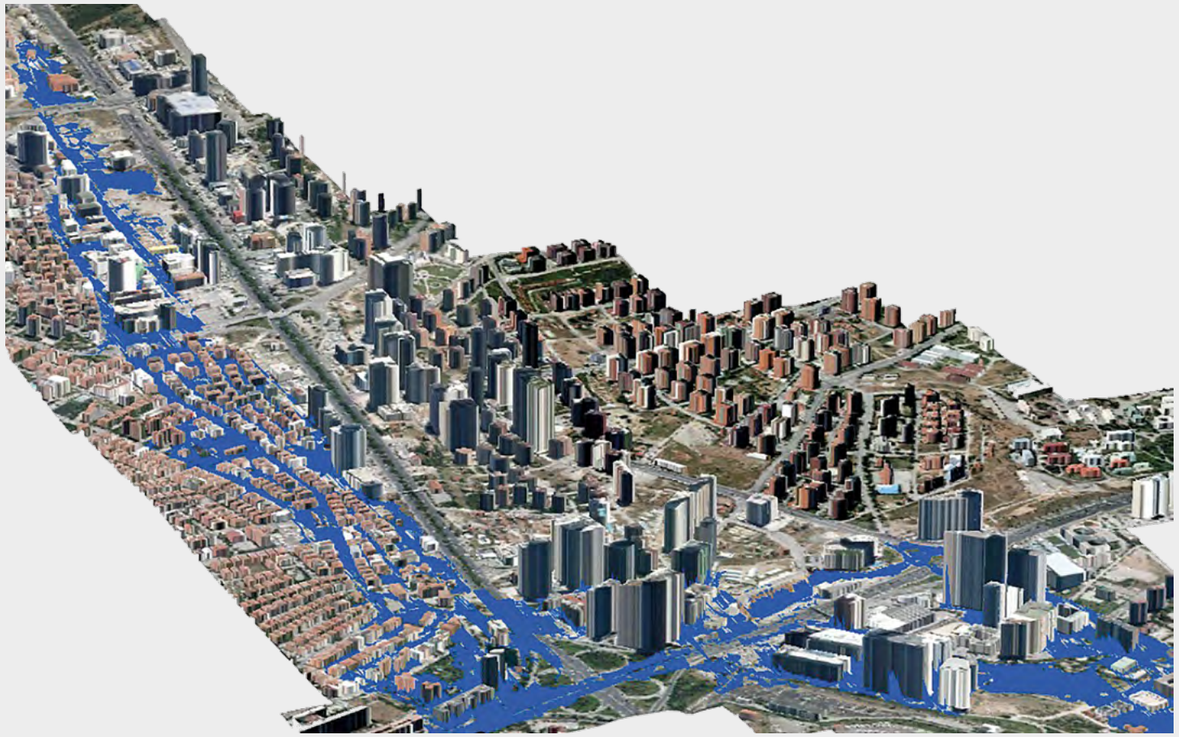
Tractebel Hidro Dizayn Mühendislik A.Ş.
General Directorate of State Hydraulic Works 5th Regional Directorate, Ankara

FLOOD CONTROL and PROTECTION
1D/2D FLOOD MODELLING

ANKARA PROVINCE
FLOOD HAZARD MAPPING ENGINEERING SERVICES

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
5th Regional Directorate, Ankara





FLOOD CONTROL and PROTECTION
1D/2D FLOOD MODELLING

GİRESUN, RİZE, BAYBURT, TRABZON PROVINCES FLOOD HAZARD MAPPING CONSULTANCY SERVICES

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
22th Regional Directorate, Trabzon

BOLU PROVINCE FLOOD HAZARD MAPPING CONSULTANCY SERVICES

Republic of Türkiye
Ministry of Agriculturre and Forestry
General Directorate of State Hydraulic Works
5th Regional Directorate, Ankara

Within the scope of the projects;

Sediment samples were collected from the river beds to determine the manning coefficients along each stream.

Hydrological analysis was carried out and hydrographs with return periods of 2-, 5-, 10-, 25-, 50-, 100-, 500-, 1000- years have been calculated.

1d/2d hydraulic modelling studies were performed using HECRAS (USACE), SOBEK (DELFT) and MIKE (DHI) softwares.

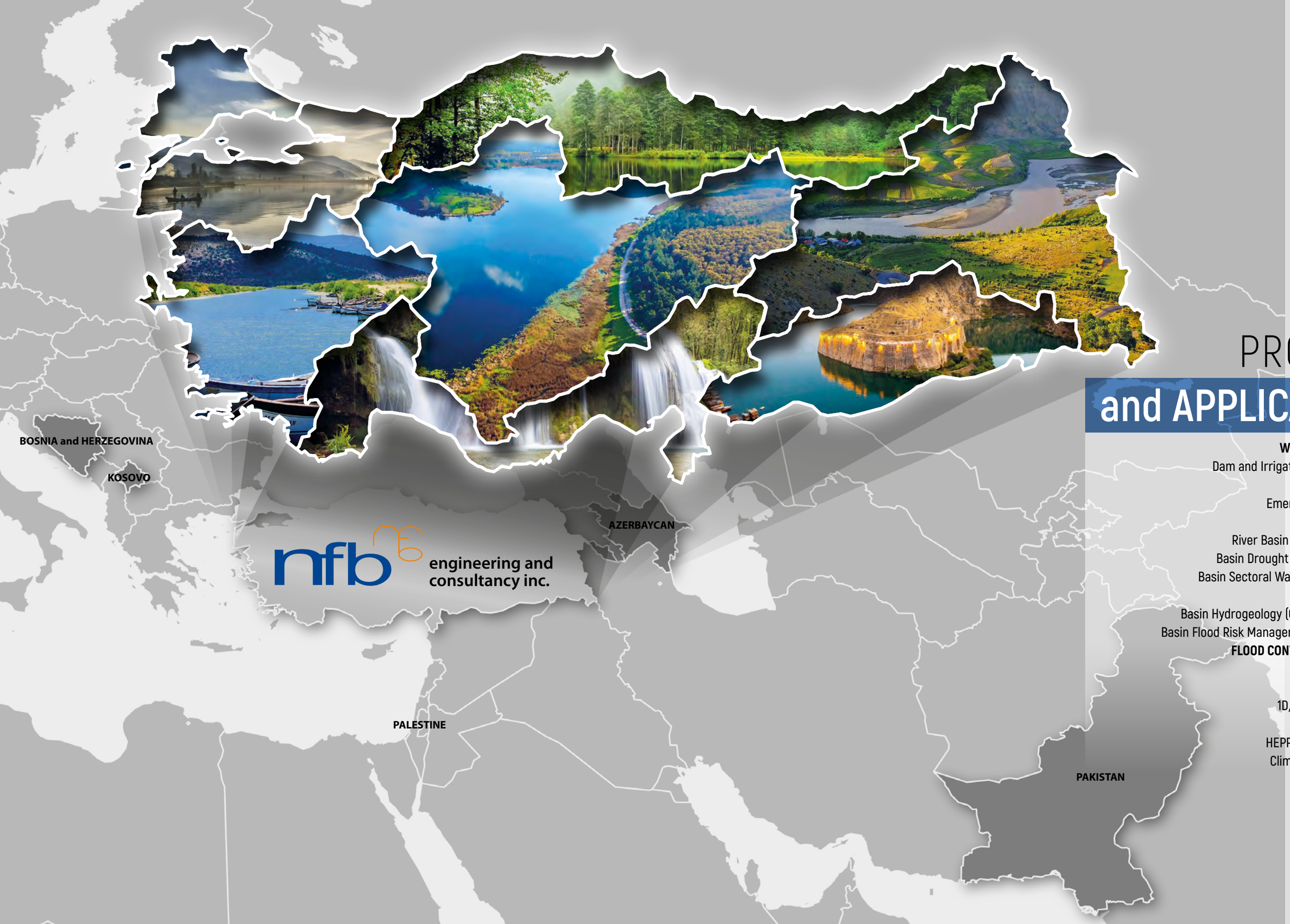
Flood inundation and hazard maps were developed using GIS.

Local drainage problems were analysed and mitigation measures were proposed.

ENERGY
HEPP FEASIBILITY REPORTS and CLIMATE CHANGE EFFECTS

- KARACAÖREN HEPP PROJECT HYDROLOGY, CLIMATE CHANGE and ENERGY PRODUCTION ASSESSMENT REPORT
- GÜRSÖĞÜT DAM and HEPP FEASIBILITY REPORT
- PİRİNÇLİ WEIR and HEPP FEASIBILITY REPORT
- ALARA ENERGY PROJECT FEASIBILITY REPORT
- ÇETİN DAM and HEPP FEASIBILITY REPORT
- ALPASLAN II DAM and HEPP PROJECT OPERATION, DOWNSTREAM EFFECT ASSESSMENT REPORT
- ÇERMİKLER DAM and HEPP FEASIBILTY REPORT
- FINDIKLI DAM and HEPP FEASIBILITY REPORT
- KALETEPE DAM and HEPP FEASIBILITY REPORT
- YUMRUKAYA WEIR and HEPP FEASIBILITY REPORT REVISION
- ARDIÇLI WEIR and HEPP FEASIBILITY REPORT

+30 HEPP FEASIBILITY REPORT



nfb engineering and consultancy inc.

PROJECTS and APPLICATIONS

- **WATER SUPPLY SYSTEMS**
  - Dam and Irrigation/Drinking Water
- **DAM BREAK ANALYZES**
  - Emergency Action Plans
- **BASIN PLANS**
  - River Basin Management Plans
  - Basin Drought Management Plans
  - Basin Sectoral Water Allocation Plans
  - Basin Master Plans
  - Basin Hydrogeology (Groundwater) Plans
  - Basin Flood Risk Management Plans (FRMPs)
- **FLOOD CONTROL AND PROTECTION**
  - Erosion Plans
  - River Improvement
  - 1D/2D Flood Modelling
- **ENERGY**
  - HEPP Feasibility Reports
  - Climate Change Effects

consultancy
and engineering inc.

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