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A chapter in the modernization of Turkey: damming the rivers, claiming the natural landscape, and building of the Seyhan Dam in Cilicia

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ABSTRACT

This article examines building of the Seyhan Dam (1953–1956) in Turkey. Both Turkish and American agents played significant roles for planning and implementation of the project during the Cold War era. The 1950s provided necessary conditions in Turkey for the rise of new actors and developments to facilitate transition from limited modernity, which had mostly manifested in urban areas, to a more comprehensive state of modernity extended to rural areas. This extension had irrevocable impacts on the natural landscape as well. By referring to some patterns of modernization, this article posits building of the Seyhan Dam as a significant example to demonstrate how state-led modernization extended its scope by means of taming rivers and opening of plains for agriculture in the Cilician (Çukurova) region from late Ottoman to Republican periods.

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Introduction

> Early in the fourth century B.C., when Cyrus the Persian and his conquering army swept south out of the Taurus Mountains toward the Mediterranean coast of Turkey, the Greek historian Xenophon wrote, 'he descended from there into a large plain. It was a beautiful and well-watered place full of all kinds of trees and of vines, and produces quantities of sesame and millet and wheat and barley.' Today Morrison-Knudsen constructors in a joint venture with the Turkish firm of Garanti İnşaat and operating under the name of Morrison-Garanti are helping to bring this same plain, near the city of Adana, to a prosperity and fertility undreamed of in Xenophon's day. They are building the Seyhan project, a multiple purpose flood control and irrigation development that is large by any modern construction standards and is a veritable giant in this rapidly developing but power-starved young republic.[1]

The analogy inspired from the legendary Persian king Cyrus, who arrived to the Cilician plains after crossing the Taurus Mountains as a victorious

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commander of his Achaemenid Empire, was recalled by a contemporary author in 1955 to describe the triumph against nature by the construction of a large dam in the same region. This quotation provides readers with many catchy words to explore the unprecedented scale of social, economic and spatial changes and their actors in Turkey in the 1950s Turkey. These include dams, rural development, electricity, power, irrigation, and more specifically, the Morrison-Knudsen and Garanti joint venture. This article examines an important period in the Turkish experience of modernity at an important threshold: the expansion of modernization from urban to rural setting by means of the construction of several dams and hydroelectric power plants to demonstrate the irrevocable transition of the rural and natural environment with a destructive modernist vision of the government in the Cold War milieu.

Unlike many urban projects, the construction of dams and their social and cultural impacts for both locals and the natural environment in Turkey have been relatively under-studied.[2] Among existing scholarship, there are Kerem Öktem and Laurent Dissard's articles which posit the dams built on the Fırat (Euphrates) River in Eastern Turkey since the 1970s were an integral tool of development and the security policies run by the state. [3] Moreover, in a recent work Stahl approaches the Keban Dam on Euphrates River as a 'technological frontier' in which environmental engineering and social reshaping took place. Borrowing from Nilüfer Göle's conceptualizations, he reads the construction of this daring project as evidence of a technocratic class of political actors in Turkey.[4] Furthermore, the spatial features of dam construction have not been examined except for two articles of Nilay Ünsal Gülmez, who studied in the 1950s the housing units near the Kemer and Demirköprü dams in Western Turkey. They were built for the technical staff of the Turkish-French joint venture and demonstrate modernist features in a natural setting and standardized design configurations in terms of planimetric layouts of the units, social stratification and domestic culture of the inhabitants. [5] Even though it is not directly related to the damming of rivers, Zeynep Kezer's article examined the spatial and cultural policies of the central government to radically transform the urban and natural setting of the Munzur Valley in Eastern Turkey in the early Republican era.[6] In brief, the architectural and cultural historiography in Turkey remains rather muted in terms of the construction of dams and the social environments designed around them.

In this paper, I examine the history of the planning and construction of the Seyhan Dam (1953–1956), a remarkable infrastructure project in the Cilician plains (Çukurova) of Turkey. This is significant because the finance, project development and construction of the dam coincided with the new political and economic conditions of the Cold War period and this project turned into a platform where the relation between Turkish and American agents played remarkable roles in a new chapter of the Turkish history of

modernization. Even though there has been wide popular and academic literature on the late Ottoman and early Republican period development in Turkey, works on the mid-twentieth century have remained relatively limited. Moreover, features of modernization in peripheral Turkey have not been substantially examined at a scholarly level. This article blends critical examination of many primary sources collected in the USA and Turkey with analysis of several secondary sources, and it provides new perspectives for further research in the field of Turkish studies. This approach provides readers with some necessary tools to trace both the continuities and ruptures of Turkish modernization from the Ottoman Empire to the Republican period for the Cilician plains. It also helps to contextualize similar projects implemented in the rest of the world during the Cold War period.

Dams: icons of rural development and modernization

The history of modernization can be understood as the history of revolutionary change of relations between the human species and its natural environment. Since the early modern period, every visible aspect of modernization stands for humans' conscious attempt to change the means of relations with nature and even to challenge nature. Humanity has (re)shaped nature relentlessly since the agricultural revolution. The impact of modernization has been mostly associated with the growing scale of humanity's irreversible intervention by use of technology in the last three centuries to exploit natural resources. As Marshall Berman emphasized, in the mid-nineteenth century Marx and Engels examined the nature of the relations between the bourgeoisie and nature and underlined the 'subjection of nature's forces to man, machinery, application of chemistry to agriculture and industry, steam navigation, railways, canalization of rivers, whole populations conjured out of the ground.'[7] According to Marx,

> For the first time nature becomes purely an object for humankind, purely a matter of utility; ceases to be recognized as a power for itself; and the theoretical discovery of its autonomous laws appears merely as a ruse so as to subjugate it to human needs.[8]

The digging of canals, altering riverbeds for transportation and irrigation purposes, construction of piers and harbors on the seashores, and opening of turnpike roads were the preliminary large-scale means of human's intervention on the natural landscape and they marked an important threshold in the eighteenth century.[9]

Technologies of the nineteenth century heralded an explosion of human intervention to nature in greater scale. The invention of the steam engine and introduction of railroad technology became a triggering force behind immense change. Moreover, by changing the experience of travel between

cities, construction of railroads heavily bore on the designation of the natural landscape by human intervention.[10] For centuries, land trade routes sought for the most convenient and physically available terrains and respected the natural borders, slopes of the hills and passages. In order to provide faster travel, the railroad contractors had to decisively reshape the natural setting. Opening tunnels, cutting the terrain, laying down iron rails, constructing iron bridges became perpetual traces of modern societies in nature. Constituting the infrastructure of capitalist economy, mining, deforestation, agricultural plantations, diverting riverbeds, opening of irrigation and transportation canals enabled the modern societies sustain the growth of their capitalist economies and the natural environment has been exposed to an unprecedented scale of human intervention since the nineteenth century. Consequently, colonization and hunger for the use of raw materials became an enormous push behind this massive change and the entire earth turned out to be the object of exploitation. The Suez and Panama Canal became the symbols of modernizing hegemonic authorities which consolidated their power on nature in colonial lands, associating the multiplying volume of an exploitation economy.[11]

The proliferation of dams in Europe, in the United States, and then in the rest of the world have become one of the icons of humanity's challenge to nature. In addition to agricultural utilization, it also became widespread to construct dams in river valleys nearby urban areas to supply potable water. Stimulated by the excessive energy needs for mechanization, the introduction of technologies to produce, accumulate, and transmit hydroelectric power from the kinetic energy of water in reservoir lakes made dams enduring and versatile energy sources for civic and industrial use. The consequence was the commodification of water sources: water became a measurable commodity whose value was associated to its strategic importance and therefore it was no more a universal basic right for everyone since having free access to water sources was restricted by public and private authorities.[12] As McCully stressed

> the taming of rivers is one of the evident illustration of the connection between control of nature and the control of the society since in many cases, dams are built and operated by an elite with bureaucratic, political or economic power behind. Therefore, the dams give this elite the ability to direct water for their own benefit, depriving the previous users of some or all of their access to riverine resources.[13]

In this manner, rivers were considered to be everlasting source of energy to sustain exploding urban societies.[14] Furthermore, building of dams shifted scope of industrial modernization from urban centers to natural landscapes. It was designed to regulate nature, to give it order and to make it accountable and predictable, since nature implied an 'uncivilized,' dark, and 'untamed' wilderness which should be controlled by civilized society.[15]

The beginning of the twentieth century witnessed the construction of mega dams across the world. The most remarkable one was the Hoover Dam, which was built during the Great Depression of the early 1930s as a part of extensive economic rural development projects introduced by President Roosevelt in the USA. Construction and operation of Hoover Dam made a global impact.[16] Built on the Colorado River, it was constructed between 1931 and 1936 and completed two years earlier than the estimated deadline. This glittering result provided the building consortium of six companies a worldwide recognition and prestige. Among them, Morrison-Knudsen Inc. became the most famous one, and its fame led it to receive commissions of similar mega infrastructure projects all around the world. After the Hoover Dam, the scale and construction of dams in the USA were considered as icons of American ingenuity and modernity.[17] As Marshall Berman pointed out, by the use of exciting new technologies 'the great New Deal projects dramatized the promise of a glorious future just emerging over the horizon, a new not merely for a privileged few but for the people as a whole.'[18] The operator of the dam, the US Bureau of Reclamation, also became a shining model for many developing countries for the management of water resources, providing new job opportunities and consequently triggering economic growth. [19]

Construction of a dam is an outcome of sophisticated engineering and precision after hours of survey, analysis and calculation. The project development phase heavily depends on empirical studies and data collection. It also requires trained technical staff and basic equipment and furthermore, it emphasizes the sophisticated level of scientific accumulation of the commissioning agency or the state. In other words, it demonstrates the capability of collecting, processing and interpreting scientific data. In addition, dam construction presupposes the availability of necessary technology and expertise in concrete pouring, forming, and steel workmanship fields. Digging water tunnels at sturdy rack formations demands immense machinery, provision of necessary security precautions, and high workmanship quality.[20]

Spectating the flow of water through spillways is a dazzling experience for observers. For instance, soon after its official inauguration, curiosity toward Hoover Dam went beyond technical visits of engineers. The site became a tourist destination. Its scale and design were associated with symbols of twentieth century progressive modernism. It was also a work of modern architecture that referred to several themes of its age: efficiency, utilization of advanced technology, inclusion of abstract images into surface design, and emphasis on beneficial results for society.[21]

Hydroelectric power generation structures also became an inspirational form for the imaginative depiction of future cities. For instance, they popped up in Antonio Sant'Elia's utopian city, *La Citta Nuova*. Dams emerged in Tony Garnier's utopia, *Une City Industrielle,* and they were also thoroughly examined by Le Corbusier as well.[22] More than any other

megastructures, dams had the ability to symbolize the progress of modern society by means of emphasizing its rupture from a life ruled by nature.

Concurrent with the construction of Hoover Dam, the Republican Turkey planned to build its first dam near its new capital city, Ankara, to supply potable water. The Çubuk Dam, built in 1930–1936, also became a stage for the representation of modern recreation experience for the citizens of Ankara. Beyond its functional utilization, landscape design by means of promenades, open and closed public spaces and provision of a boat pier made tamed water an object of visual and tactile experience for visitors.[23] Even though it was not physically as impressive as its counterpart in the USA, it was portrayed as one of the iconic objects of nation building of Turkey during the early Republican era. In a similar fashion, the Marathon Dam built near Athens in 1930s was the triumph of Athenians against their destiny, namely the problem of water scarcity and during comprehensive national modernization period of Greece it became a monument of economic territorialization of rural areas.[24]

As frequently noted in the academic literature, the political context of the Cold War era provided the United States appropriate conditions to export its technical and economic assets to its allies in the Western Bloc and to many non-aligned countries. In the first two decades of the Cold War, American technicians and construction companies took active roles in building of mega dams from Egypt to Iran and Pakistan to Vietnam.[25] These ambitious projects were welcomed by the host countries in 'heroic optimism' of the machine age and they had already been convinced that 'a new and better life was possible through the machine.'[26] President Harry Truman introduced the Point Four Program (1949) for technical assistance to developing countries in order to provide a basis of legitimization for political containment projects, and it was soon remodeled as the International Cooperation Administration (ICA) in 1955 for non-military aid. Later it became the precedent of US Agency for International Development (USAID), which was founded in 1961. Furthermore, the International Bank for Reconstruction and Development (IBRD), later reorganized as the World Bank, was initially founded to finance the reconstruction of European counties after the devastating results of the war and its mission later extended to development of other countries by means of infrastructure investment. At the beginning of the Cold War era, the World Bank became the prominent global financial agent supporting the construction of mega dam projects all around the world.[27]

In the meantime, mega dams were not only the economic priority of the USA and Western Bloc. The Soviet Union and China considered rural development as an important stage for the welfare of their societies and to eradicate poverty and hunger. [28] Accordingly, dams became the engines of development and progress regardless of ideological paths until the 1970s when anti-dam campaigns emerged as a consequence of increasing level of popular

consciousness for the protection of nature.[29] For decades, similar to its technological precedents of the nineteenth century, mega dams were also praised as humanity's staggering challenge to nature in the 'developing' world.[30] Taming the rivers, changing the nature of their valleys, isolating many indigenous flora and fauna from their environments, and exclusion of local people from their living environments have all been common material features of damming.

Dams also symbolized the economic independence of formerly colonized nations and their diligent statesmen, who ambitiously invested in dams and irrigation projects, therefore it made mega dams the favorite infrastructure of nation-builders of the postcolonial era.[31] They were versatile tools for progress and development. They were supplied of hydroelectric power and water for irrigation and urban use and controlled devastation of floods.[32] For decades, total generation and consumption of electrical energy and energy consumption per capita was closely associated with the level of industrial progress, a trademark of urbanized society and material prosperity. Therefore dams supplying hydroelectric power became critical assets for these countries and these infrastructure investments were considered as a point of national pride. In many African countries and in the Indian subcontinent, construction of dams were publicly perceived as among the remarkable features of economic independence and progress. Prime Minister Nehru described dams as the temples of modern India.[33] Afghanistan undertook its most comprehensive rural development project in 1946 which was culminated by the construction of Helmand Dam and the government commissioned this task to American firm Morrison-Knudsen Inc.[34]

Beyond rural development, a growing urban population, particularly the emerging bourgeoise, demanded cheap electric energy for residential use in the mid-twentieth century's growing urban centers. A remarkable example was the commissioning of Karaj Dam near Tehran in 1958–1961 to an American company after the Mosaddeq government was overthrown after a coup. The new government utilized the new dam to decrease social tensions by addressing the cheap energy demand of Iran's growing urban society[35] Perhaps one of the most spectacular or controversial examples of post-war tensions was staged between the Soviet Union and the USA for finance and construction of the Aswan Dam in Egypt. Gamal Abdel Nasser, who toppled the Egyptian monarchy in 1952 and was elected president in 1956, sought to immortalize his daring vision by building the high Aswan Dam to tame the Nile River. For the United States, alliance with Egypt would be an important ring of the chain of economic and geographical containment of the Soviet Union. Nasser successfully negotiated with the USA and World Bank for a loan, but it was canceled after revelations of the Egyptian purchase of the arms from the Soviets and the nationalization of Suez Canal in 1956. After this, he turned to the Soviets for financial and technical

support for the Aswan Dam. This ambitious project was completed in 1970 shortly before Nasser passed away.[36]

The question of Taming the Seyhan River and construction of the Seyhan Dam

Financing the dam

When the new republican regime established in 1923, there had been a major economic problem in Cilicia which remained unsolved for decades. It was the unpredictable agricultural yield due to the changing patterns of rainfall every year. The irregular annual flow of Seyhan and Ceyhan Rivers from upriver seasonal rains frequently submerged lower farmlands in spring and fall periods but caused deprivation in low-flow years. The first attempts to regulate the flow of the Seyhan River went back to the late Ottoman period. A special report was submitted to the Sultan Abdülhamid II in 1907, explaining the necessity to take necessary precautions to prevent floods and overflow of the Seyhan and Ceyhan rivers. The report also mentioned petitions to construct walls and canals to control the flow of the rivers and drain marshlands.[37] In 1909, the Sublime Porte (Ottoman Government) received a serious petition to obtain concessions from a French entrepreneur to construct a flow regulator and to drain the plains and open up farming, but no substantial result emerged from any attempt.[38]

Field surveys conducted in 1938–1939 confirmed the necessity of a flow regulator to be built on the Seyhan River, a few kilometers away from Adana. The flow regulator structure was completed in 1943.[39] However, the devastating floods of 1947 and 1948, proved the insufficiency of the new flow regulator.

In the meantime, the emerging economic and political conditions of the post-war era made the possibility of comprehensive solutions easier. Turkey was waging a remarkable transition, from a state-dominated economy and one-party regime to a relatively more liberal economic policies and multiparty system. When the Cold War began, Turkey was considered under serious threat of communism and was taken into Truman Doctrine financial assistance in 1947.[40] Turkey aimed to turn the new conditions to a financial opportunity and negotiated with the US to receive financial and technical support in the frame of the Marshall Plan. Turkey's proposals were initially rejected due to its relatively better economic conditions. However the rise of the 'communist threat' around Turkey and implementation of necessary liberal policies stimulated the US government to take necessary actions to assist Turkey. Many American experts visited Turkey and drafted reports for Turkey's economic transformation and assisted in founding many state institutions.[41] The projected role of Turkey was to supply agricultural products for Europe,

which had serious problems to feed millions of people during and after the war. Therefore, the international loans and grants would be utilized to leverage the agriculture sector and related infrastructure (transportation, storage and harboring) in Turkey.[42] It intended to fund many irrigation projects, including those in the Çukurova region, by international grants and loans.

Due to the revised economic development plan of 1947, the investment priority of the government was threefold: construction of several dams all around the country, building of granaries for storage of agricultural production, and modernization of harbor facilities in major port cities.[43] In the meantime, the government was checking conditions for receiving international loans to finance the dam on the Seyhan river along with many other dams to initiate a rural economic development program. The government expected to get necessary loans from the International Bank for and Reconstruction and Development (IBRD). As stated above, devastating rainfalls of 1947–1948 period forced the Turkish government to search for comprehensive solutions to secure the region from destructive floods and provide water for irrigation. A comprehensive report was necessary to apply for IBRD funds and the government appointed J.P. Growdon and John S. Cotton of International Engineering Co. as consultants. They visited the region and submitted a report to the Turkish government entitled 'Economic Study of the Lower Seyhan Valley' in 1948, which was duly submitted to the IBRD in 1949.[44] It was followed in 1950 by the designation of contract drawings and specifications by engineers of the same company in San Francisco in close communication with Directorate of Electrical Power Resources Survey and Development (EIE) in Turkey.[45] The IBRD assigned experts to visit Turkey to make necessary surveys and prepare reports to verify conditions. The most remarkable reports were drafted by Max Weston Thornburg and James Barker, who visited Turkey in 1949 and 1950 respectively. They emphasized alignment of Turkey's development proposals with the ones anticipated by the IBRD Aligned with the US's projection of Turkey in the post-war era, they considered Turkey as a principal agricultural supplier to Europe and they underlined necessity of the establishment of modern agricultural infrastructure from irrigation to transportation, storage and shipment of products.[46] However, the foreign experts were against the idea of expensive and ambitious project proposals such as making investment for large dam structure. Instead they suggested construction of smaller irrigation reservoirs. They also highlighted the necessity of the contribution of private sector in Turkey for the construction and operation of these facilities.

Even though the 1950 elections marked a decisive loss for the 27-year-long reign of Republican People's Party one-party regime, the Democrat Party (DP) maintained the policy of rural development and went on with negotiations with the international agents. The exclusion of large-scale dam projects for international funding in Barker's report was worrisome news for

the government. Prime Minister Adnan Menderes met the Vice President of the World Bank during the latter's visit to Turkey to ascertain why the Seyhan River Dam project was so crucial for Turkey's economic development.[47] In the meantime, the government also hired Frederic R. Harris Inc. consulting engineers to present a national-scale hydraulic electrical power development program for Turkey, including the use of subsurface waters, construction of dams, diversion canals, wells, flood control systems and hydraulic electric plants.[48]

After series of negotiations with the representatives of the Turkish government,[49] the World Bank finally agreed to provide Turkey with a loan of $25.2 million in June 1952 for the construction of a large dam on Seyhan River.[50] The estimated duration of the construction was four years and the loan would be paid back in 25 years. [51] The bill regarding the approval of the agreement passed in the Turkish Parliament in June 20, 1952. [52] The model for the finance of the project was unique in Turkey since the remaining part of the total cost would be met partially by the state (about $4.28 million/ 14 million Turkish lira) and private stockholders ($5.7 million USD / 16 million lira).[53] According to the loan agreement, the operation of electrical power generation and supply would be provided by a private company instead of the state institutions. Çukurova Power Utility Company (*Çukurova Elektrik Türk A.O*) was founded soon after the convention. The government and private shareholders provided capital of the operational company.[54] Accordingly, the government granted the right of generating, transmitting and selling electrical energy to the company in August 1953. Therefore, Çukurova Company became an archetypal model in Turkish economic history as the provider of a public service by a private company which was originally a government incentive and whose majority shares were held by thousands of shareholders.[55] In a short time, the shares were purchased by the local people of the region and the number of total shareholders exceeded 14,000.[56] This international finance and private operation model was adapted to many other dam projects in 1950s.

Dams in post-war Turkey: search for a construction and operation model

The construction of Seyhan Dam displays many themes and concepts, providing a comprehensive frame to understand the political, economic and architectural context of the 1950s Turkey. First, the dam exemplified a collaborative effort established between the local and international agents, from project consultation and design to completion of construction process in accordance with general complex building practices of the 1950s in Turkey. In this period, the local building contractors were not commonly believed to be experienced enough to handle such complex projects.

Therefore, these projects were mostly commissioned to a joint venture, in which internationally experienced companies worked with a local partner company. Thus, these mega projects were expected to turn into a learning environment for local agents by means of experimentation and international transfer of know-how. In this respect, widely-recognized international companies such as Morrison-Knudsen Inc. (USA), Hochtief AG (Germany), Philipp Holzmann AG (Germany), Dyckerhoff-Widmann (Germany), Entreprises Métropolitaines et Coloniales (EMC / France) took significant roles not only for realization of many megaprojects but also, they trained local engineering companies in such projects. The junior partners soon after became major commissioners of many similar public sponsored projects in the following decades. Therefore, the 1950s and 1960s became a period when many local construction and engineering companies were founded by entrepreneurs, and later encouraged and supported by the state in order to establish a competitive construction services market in Turkey. Without doubt, the existence of first private architectural partnership offices and companies also coincided with the promotion of private enterprise and growth of first generation construction companies in the 1950s.[57]

The joint venture model did not remain exceptional for the Seyhan Dam. For instance, Sarıyar Dam near Ankara was constructed by another consortium: RAR-Türk Ltd[58], which was formerly the contractor of the concrete works of the Mausoleum of Ataturk (*Anıtkabir*), and German Hochtief AG and Siemens Bau Union GmbH. Hochtief had previously taken role in the Çubuk Dam Water Filtration Station near Ankara (1936) before this task.[59] As shown in the table below (Table 1), the contribution of international partners is noteworthy for sophisticated engineering works in Turkey in the 1950s. However, small scale dams, which were mostly built for regional irrigation, were handled solely by individual local contractors. In addition, preliminary documentation and project design tasks and construction supervision of several dams were performed by international consultants. For instance, TAMS of New York, which was the consultant of the State Hydraulic Works (DSİ) for Seyhan Dam provided the same service for Hirfanlı[60] and Demirköprü[61] Dams; and Charles T. Main Inc. served for the Sarıyar Dam project.[62]

In accordance with the recommendations of foreign experts, the foundation of an autonomous technical and administrative body became crucial to undertake construction and supervision of many dams. The waterworks division of the Ministry of Public Works was separated for the establishment of the General Directorate of Hydraulic Works (DSİ) in 1953.[63]After foundation and institutionalization of DSİ, the project development and control tasks could be gradually handled by the same agency in the following years. Consequently, DSİ surveyed six major dam projects undertaken in different part of Turkey in the first half of the 1950s. Running many major projects

Table 1. The contribution of local and international companies for construction and supervision of major dams in Turkey during the 1950s.[a]

Dam	Construction Period	Project development	Construction	Supervision
Sarıyar Dam	1951–1956	Charles T. Main Inc. (USA)	• Tunnel Work by Galip Gordam (Turkey), • Concrete dam construction: Thampson-Starrett[b] (USA) Hochtief AG – Philipp Holzmann AG[c] – Siemens Bauunion (Germany) – RAR (Turkey) • Power plant construction by Türk-Amaç (Turkey).	Charles T. Main Inc. (USA)
Damsa Dam	1952–1956	DSİ	Kamil Özsarıyıldız Ltd	DSİ
Elmalı Dam	1952–1955	Etablissement Billard (France)	Etablissement Billard (France)	?
Kemer Dam	1954–1958	T.A.M.S (USA)	Entreprises Métropolitaines et Coloniales (France) and RAR Türk (Turkey)	DSİ
Hirfanlı Dam	1954–1958	T.A.M.S (USA)	Wimpey and Co. Ltd (UK)	DSİ
Ayrancı Dam	1954–1958	DSİ	Wilhelm Wahman (Germany) and Oğuz Babaoğlu (Turkey)	DSİ
Demirköprü Dam	1954–1960	T.A.M.S (USA) and E.İ.E (Turkey)	Entreprises Metropolitaines et Coloniales (France)- RAR Türk (Turkey)	DSİ
May Dam	1957–1960	F.H. Kocks K.G. (Germany)	İbrahim Aşcıgil (Turkey)	DSİ

[a]Prepared by the author by compiling data from Ural and Ungan, *Large Dams in Turkey*.
[b]"Thompson-Starrett Heads Building of Dam in Turkey on E.C.A. Funds" (*New York Times*; February 27, 1952).
[c]German-based Philipp Holzmann AG company was founded in 1849 by Johann Philipp Holzmann. Since the last decades of the Ottoman Empire, it had been the commissioner of many public projects in Turkey, including the railway station in Istanbul at Haydarpaşa and construction of sections of the Istanbul-Baghdad Railroad. In the 1950s, the company took a role in construction of Samsun harbour facilities in joint venture with RAR-Turk and Hochtief.

necessitated employment of many architects and engineers in many state offices. Hence, the government made two remarkable attempts for the provision of essential technical staff. First, three new universities were founded in 1950s modeled after inspecting the American higher education system: Middle East Technical University in Ankara, Atatürk University in Erzurum, and Black Sea Technical University in Trabzon. [64] Second, to make engineering and architectural careers in governmental institutions more attractive, a special cabinet decision was issued in 1958 to remarkably increase their wages and salaries compared to other administrative staff. [65]

After the financial aspects of the project were resolved, the Ministry of Public Works signed a contract with a New York based engineering and consultancy company, namely Knappsen-Tippets-Abbet-MacCarthy (later TAMS), to draft necessary administrative and technical specifications for the construction phase of the project.[66] The international bidding was held

in July 1953 and a joint venture won the tender among 13 international bidders. [67] The companies constituting the joint venture were Morrison-Knudsen International Inc. of the USA and Garanti Construction Ltd (*Garanti İnşaat Ltd.*) of Turkey.

The structure of the winning bid was quite striking. As introduced before, the foreign partner was among the builders of the Hoover Dam and many other megaprojects. [68] The prestige and recognition acquired from these projects opened new paths for the company to get numerous commissions, and the consequences of the post-war period enabled its fame to extend at the international level as well by the operation of many infrastructure projects all around the world.[69] A cover story in *Time* magazine (on May 3, 1954) entitled 'Builders Abroad: Ambassadors with Bulldozers' highlighted the company. The cover was a visual collage of Harry Morrison's portrait and a crane image on the background, which firmly holds and elevates a globe figure placed into its bucket. The subheading heralds Mr. Morrison's global vision: 'Builder Harry Morrison: To Tame Rivers and More Mountains'.[70] In the first two decades of the Cold War era, as the headline explicitly suggests, American companies, which received international commissions to build several projects, were conceived as the messengers of liberalism. They also represented progressive technologies of the United States all around the world. The message was clear: the economic prosperity of the developing world would only be achieved by the utilization of latest machinery and technology of these international companies for the construction of infrastructure and facilities.

The minor partner of the joint venture, Garanti Construction Ltd, was an inexperienced and relatively new company. It was founded in 1948, only five years before this major project. The first chair of the executive board was Cabir Selek. He was a deputy in the assembly from 1943–1946 and joined to the then-opposition party, the DP, after its foundation. In 1946, he was among the founders of Garanti Bank. Garanti Construction was an enterprise of Garanti Bank to increase its profitability. Selek was later appointed to the IBRD as Turkey's representative. In this context, even though Garanti Construction would not be the best match for such a partnership in technical manner, the political network and influence of its executive committee members made it the fittest candidate in Turkey. It was also a suitable candidate in the new era to promote private sector enterprise and development of Turkish construction sector by means of transfer of essential know-how and expertise.[71]

Building the Dam

The consortium commenced site work in Adana in August 1953 and the official ground-breaking ceremony took place in October 24, 1953. The day

after, national newspapers praised the project with enthusiasm. The dam would be the milestone for the destiny of Çukurova region. Prime Minister Menderes attended the special ceremony along with the parliamentary speaker Refik Koraltan, Minister of the Public Works Kemal Zeytinoğlu, and many other dignitaries. The newspapers published news about the events including the day before and after, which demonstrates sizable public interest.[72] Journalists also reported the expected economic and social benefits from the project:

> Yesterday the foundation stone was laid for a fortunate and auspicious work for our country, for a source of prosperity and wealth … We mention the Seyhan Dam to turn Çukurova, which is among the most productive and fertile regions of our country, to a place more bountiful and wealthier than the Nile Delta … the economic value of the project is great; it would save one million decares of land from floods and would irrigate 1.6 million decares of land … and would lead to increase at agricultural yield which would annually bring 100 million dollars … besides it also means to produce cheap electricity and to save coal to be burnt in coal plants and therefore the total annual return would exceed 161 million dollars … When Seyhan and other dams start operating, the appearance of our country will change immediately and our nation will widely reach to the prosperity that we deserve.[73]

The proximity of the railroad station at Adana and the availability of direct railroad connection to the İskenderun and Mersin ports eased supply of construction materials and transfer of machinery.[74] The excavation, foundation works and construction phases were maintained by a crowded technical and administrative staff at all ranks. Although the numbers fluctuated from one phase to another, there were more than 40 American supervisors and about 1,500 Turkish technical and administrative staff in the field.[75] Morrison-Knudsen transferred more than 80 pieces of major construction and excavation equipment to the site and the builders set a rapid pace of progress.[76] Additionally, almost all tools and equipment were imported from Europe and the United States: Turbines and generators were German-made, spillway and intake gates came from Austria, butterfly valves and switchyard steel from Italy, piping and valves from England, transformers from France, compressors from Belgium, and electrical materials and construction equipment from the United States.[77]

Morrison-Knudsen's photographers regularly documented the entire process of steady construction, the restless movement of equipment, the prudence of the supervisors and the vigor of workers. In each frame, the observer comes across a self-assured experienced supervisor commanding either a group of workers or machinery. They documented the triumph of the company over natural obstacles. Carefully selected pieces from these bulky records were regularly published in Morrison-Knudsen's monthly periodical, *The Em Kayan*, along with the news and images coming from many other

construction sites dispersed around different continents. The name of the periodical derives from the spelling of the initials of the company (M-K) and it aimed to create a sense of belonging for the employees. The periodical was not only to publish recent news and images for professionals; it was also utilized as a medium to enable Morrison-Knudsen employees to communicate with their families living overseas. In each issue, there are photos of technical and administrative staff in groups framed with an image caption identifying each employee. Furthermore, the magazine published many special events, greetings and ceremonies regarding the precious moments of company's employees as well as tributes to the retired staff.

The Em-Kayan informed its readers about the developments at Seyhan in different issues. In December 1954, technical and administrative staff was portrayed in a full-page photographic collage with a very assertive title: 'They build for new water wealth in the modern Republic of Turkey'. The American supervisors were on the top image which was placed above the title. There are four other photographs capturing warehouse, accounting and engineering cadres of the company, which were mostly framed with other Turkish staff. The last one (Figure 1) captures officials of the ministry and their consultants.

As for specifications, the Seyhan Dam was projected to be an earth-fill dam to irrigate 154,000 hectares of agricultural field and generate 284 million kilowatts of electricity annually. It was expected to protect 85,000 hectares of fertile land against flood damage. The height of the crest above the ground level was 50.7 m, with a width of 9 m and total length of 1955 m. The total volume of the embarkment was 7.5 million m^3.[78] The storage capacity of the reservoir to be created by the dam would be about 1450 million m^3, with a useful storage of about 575 million m^3. The total area of the water reservoir exceeds 40 km^2 and included the territories of several villages, which caused relocation of many people. Moreover, the rising water level filled the valleys which the Seyhan river and its tributaries cut through, so that many animal species were submerged. However, the environmental impacts of the project were disregarded during the time of construction, as it happened in many of its contemporaries at global scale.

Patterns of mid-century Turkish modernization and the Seyhan Dam: materials, technology and staging the achievement

The scale of the Seyhan project and the state-of-the-art technology utilized during and after the construction reflected many modernist ideas in Turkey during its mid-century political and economic transition. The Seyhan Dam demonstrates peculiar aspects of construction of Turkish modernity in a literal manner along with many concurrent ground-breaking experimental projects, including Istanbul's Hilton Hotel, the first modern tourism facility in Turkey, and the Emek (Labor) Office Block, which was known as the

They Build for New Water Wealth in the Modern Republic of Turkey

SHOWN ON THIS PAGE are many of the Turkish and North American supervisors who are directing construction of Seyhan Dam by Morrison-Garanti in southern Turkey.

1. North American supervisors, left to right (front row) R. Zawicki, asst. master mechanic, R. R. Allen and D. Brolliar, mechanic foremen, W. C. Ward, purchasing agent and chief warehouseman, W. Harris, excavation foreman, H. W. Haworth, engineer, H. M. Howard, mechanic foreman, E. S. Huddleston, chief accountant, W. C. Crawford, steel supt., H. Cabral, accountant, H. S. Arnold, tire repair foreman; (center row) G. Schuerer, excavation foreman, J. P. Chrudimsky, master mechanic, F. Uriona, excavation foreman, A. C. Graf, paymaster, Guy Roark, camp manager, E. G. Shaver, business manager, J. A. Raftery, general supt., C. H. Olds, excavation foreman, T. Bailey Lee, excavation supt., M. Hackman, engineer; (back row) Jack Gray, electrical foreman, R. B. Pechner, engineer, J. Looman, carpenter foreman, K. N. Jenkins, welding foreman, H. E. Buckert, project manager, N. C. Burgess, carpenter foreman, J. L. Gant, administrative assistant, E. N. Bowles, chief engineer, A. A. Stone, engineer, Duane Buckert, concrete supt., R. L. Kelley, engineer, R. M. Broom, concrete foreman, B. S. Van Hoosear, electrical foreman, and D. Bowman, concrete foreman.

2. Warehouse people, left to right (standing) A. Zulfi Gurisik, Veeihi Kop, warehousemen, Victoria Apsa, Ravil Selihmet, accountant, Connie Crawford, Akif Balam, accountant, Ibrahim Derlen, foreman, Shirley Ergonenc, Cevat H. Yali, asst. chief warehouseman, Orhan Dogan and Dede Ozkan, Hamza Gungor, foreman, Turghy Altikulac, Abdullah Torun and Hakki Guzel; (kneeling) Coskun Senchan, Haluk Balam and Mustafa Adali, warehouseman.

3. Accounting department, left to right (seated) Bulent Hasari, accountant, Ercument Erdilek, translator, Zehra Kuntkaya, typist, Molly Paskali, secretary, Meryem Turkkan, clerk, Necla Oncel, translator, Tarik Guner, accountant; (standing) Selahattin Artebil, accountant, Nurettin Orun, typist, Mithat Hokkaci, accountant, Cemal Demirol and Mustafa Arinel, clerks, Tonguz Kaya, translator, Suleyman Veziroglu, accountant, Bahaettin Yalim, clerk, Husnu Yuce, cost engineer, Henry Cabral, accountant, Ferit Zeren, clerk, Ibrahim Senel, typist, Ali Arikan and Fikri Ugur, clerks, Ibrahim Ander, Alex Bonguardo and Ramazan Kayaokay, accountants.

4. Engineering department, left to right (sitting) Hikmet Ugurlubilek and Resai Yener, technicians, Melih Durusan, design engineer, Nimet Bayram, secretary, Sabahattin Keskin, draftsman, M. Zeki Bogut and Gultekin Salli, design engineers; (standing) Ismail Ergonenc, design engineer, Haldun Kocataskin, electrical engineer, Selim Incel, draftsman, Atila Kurtman, design engineer, O. Rifat Morsallioglu, mechanical draftsman, Nihat Alkurt, electrical draftsman, Nikola Tavukcuoglu, mechanical engineer, Ali Sahin Ozsoy, draftsman, Namik Atakkaan, electrical engineer, Emanuel Agapitidis, office technician, Theodor Surmelis, design engineer, Prodromos Piciokos, project engineer.

5. Ministry of Public Works and consultant representatives, left to right, Fehmi Erel, ministry civil engineer, Orhan Sorguc, ministry mechanical engineer, W. B. Carr, resident engineer for consultant to the ministry, J. S. Perry, assistant resident engineer for consultant, and Mehmet Sumra, ministry assistant resident engineer.

The EM-Kayan December, 1954 5

Figure 1. Technical and Administrative Staff at Seyhan. Source: "Seyhan Dam Rises in Modern Turkey" *The Em Kayan* 13, no. 10 (December 1954): 3–5. Courtesy of Boise State University Library Special Collections and Archives.

first skyscraper in Ankara. The common feature of all these projects was the introduction of new modes of modernity into urban or rural settings. They were all challenging cases in terms of the speed of construction, building technology and provision of services and unleashing new potentials of concrete workmanship. Even though reinforced concrete was not a new method for

Turkish construction, the experimental use of this material in buildings remained relatively novel.

Almost contemporary with the construction of Seyhan Dam, Gordon Bunshaft of Skidmore-Owings-Merrill Architects (SOM) reported in 1951 that Turkish construction companies had already become familiar with reinforced concrete technology. For him, reinforced concrete was 'the greatest innovation in Turkish building methods in many years' through its wide application in many public buildings. For Bunshaft, the major obstacles were material shortages of cement, reinforcing steel and wood for form work, and inferior workmanship, which was widely observed in many projects under construction during his extensive visit in Turkey. He proposed a vigorous program within the construction industry by means of opening construction schools to improve the skills of workers, foremen and supervisors.[79]

In Adana, the progress and know-how acquired from this grand project provided local contractor partners with better workmanship quality and experience handling complex managerial aspects of a construction site. For instance, the 64-meter-high reinforced concrete intake structure, which is used to regulate the flow of water, was a real challenge in terms of advance concrete construction workmanship for the local staff. The pace of concrete works was remarkable. In May 1955, it was only at 26-meter level and in less than six months the entire structure was completed (see Figure 2). It is important to note that the speed of the construction was noteworthy for the time, when the shortage of construction materials and problems at their supply on demand was quite common. It is important to recall that many construction materials associated with modernism such as structural steel, aluminum frames, structural glass were not still available in the local market, and in

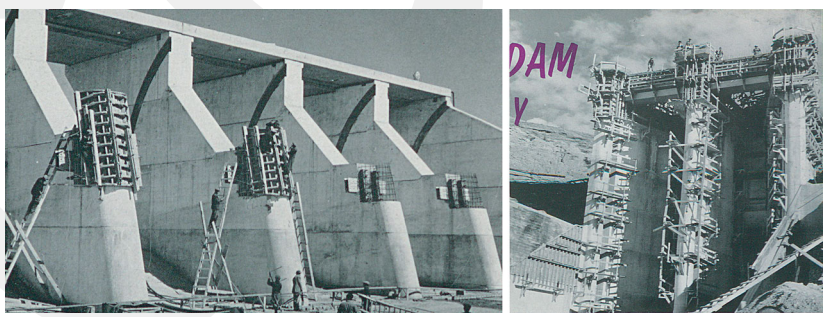

Figure 2. Left: View of part of the dam's concrete spillway structure source: "Seyhan Dam at halfway in Turkey". *The Em Kayan* 14, no 3. (May 1955): 3–5. Right: Concrete intake structure, shown at its 24-meter level, grows toward its 64-meter level. Source: "Seyhan Dam at halfway in Turkey." *The Em Kayan* 14, no. 3. (May 1955): 3–5. Courtesy of Boise State University Library Special Collections and Archives.

this context, the enthusiasm of the designers and constructors put Turkey one step forward among non-Western modernization experiences.[80] Moreover, Seyhan and other concurrent projects provided experience for concrete framing and placing for high structures and they also became pioneers of newer technologies that bolstered the wider application of complicated mechanical and electrical services in the buildings.

The other important component of a hydroelectrical energy dam is the power station, which is located at the toe of the body of the dam. Originally, two power generation units were installed in the powerhouse and extra space was provided for a third unit which would be added in the future depending on the increasing power demand.[81] Due to lower supply and demand, the provision of electrical energy remained exclusively local. At that time, there was no nation-wide electrical network covering the entire country. Thus, the Seyhan Dam became an independent private energy supplier for the entire Çukurova region.

The three immense surge tanks of 41-meters-high with a 21-meter-diameter make the building physically distinctive from a distance and they stand as solid manifestation of natural power tamed by human enterprise. The spin of tribunes by the pressure of water physically displays humanity's absolute control over natural forces and their appropriation by to serve energy needs (see Figure 3 left). The brain of this modern monument is the control room. It is the technical place where all mechanical and electrical facilities are monitored, logged and controlled by trained staff. It is a place of technological rites for human engineers and a relatively small room where many cables, buttons, screens of the state-of-the-art technology were fixed to allow a single person to control a great machine-like system (see Figure 3 right)

The 1950s witnessed the rise of a technocratic class in Turkey: the engineer-politicians. Nilüfer Göle takes engineers as the successors of Ottoman positivist reformist elites during the Republican period and she characterizes the role of

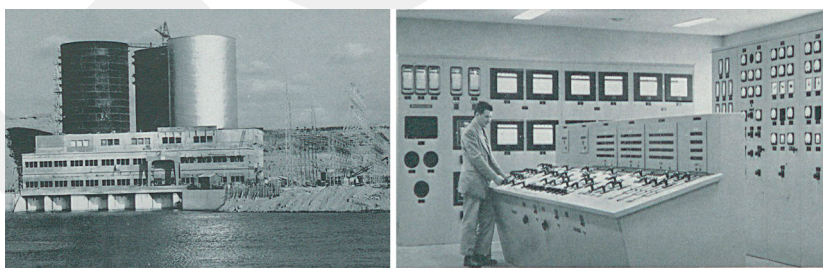

Figure 3. Left: Three Steel Surge tanks and powerhouse at Seyhan Dam. Right: Interior view of control room of the powerhouse. Source: Left: "Where History Walked…Turkish Dam Races to Finish" The Em Kayan 14, no.10 (December 1955): 3. Right: "Seyhan Dam Embarkment Topped out in Turkey" The Em Kayan 15, no.2 (April 1956): 16. Courtesy of Boise State University Library Special Collections and Archives.

engineers in 1950s Turkey as mediators of capitalist development under the state's patronage.[82] In addition to jobs in the Ministry of Public Works, Etibank, and Sümerbank, they were career opportunities in the newly established public institutions of 1950s, such as General Directorate of State's Highways (KGM) and General Directorate of Hydraulic Works (DSİ). The demand for skilled engineers was rising and there were only limited number of engineering and architecture schools in Turkey. Bunshaft described the current working conditions of engineers and architects in Turkey and pointed out the wide gap between their technical proficiency and their ability to use this proficiency for the improvement of building construction.[83] Many engineers were invited to Turkey to train Turkish staff and their wages were either compensated by international grants or by the Turkish government. Another option was sending promising technical staff abroad for technical training. Many prominent engineers, who worked in the construction of public works in 1950s and 1960s, later became technocrats and politicians in the following years.

Finally, construction of the Seyhan Dam witnessed the rise of an engineer and an executive official (later a prominent politician) in Turkey. When the siteworks approached its final stage in 1955, a principal administrative appointment happened in Ankara. Süleyman Demirel (1924–2015), who was known as an industrious civil engineer working at State Hydraulic Works, was appointed as the general director of the organization after he returned from the United States. His rise in government was noteworthy. After his graduation from Istanbul Technical University, he was hired by EIE and escorted American surveyors and engineers in Western Anatolia. Soon after, he was sent to the USA by the government in 1949 for technical training. According to his biography, he had a technical visit to the Hoover Dam. He describes his astonishment and admiration to the technical facilities by portraying himself eagerly viewing the dam for three days by sitting alone on a rock nearby.[84] According to him, this was the motivation to realize similar projects one day in his country. He also had time to examine and study many dam projects of the Tennessee Valley Authority VA during his stay.[85] After returning to Turkey, he was hired by the EIE and he worked at Seyhan Dam office of the directorate, where technical drawings and calculations of many other dams were handled in collaboration with the international consultancy company. Later, he was awarded the international Eisenhower exchange fellowship to develop his technical skills. He stayed in the United States in 1954–1955, and immediately after his return, he was appointed as the general director of DSİ. [86] His directorate was widely marked as a period of undertaking many major dam and other irrigation and drainage works. Therefore he was known as 'the king of dams' as an ambitious bureaucrat in Turkey. His illustrious technical career opened paths before him in Turkey's political environment leading to the prime ministry in 1960s and 1970s and the presidency in 1990s.

By early 1956, most of the construction works were completed. The reservoir started to hold water in February and construction was completed in April 1956, almost two months before the estimated schedule. An official ceremony was organized on 8 April 1956 with the attendance of President Celal Bayar, Prime Minister Menderes, ministers, deputies, representatives of the joint-venture companies, along with thousands of local people from Adana and surrounding cities.[87] Unlike the first years of his government, by 1956 the national economic indicators were slumping and Menderes was uneasy with the fierce attacks of the opposition. Therefore, the dedication ceremony was organized as a show of strength by the DP government and consequently the program of the official events became a trench war between the government and the opposition.

The friction is evident in the way local media reported the story. For instance, *Yeni Adana*, a daily local newspaper which was aligned with the opposition, prioritized details such as DP local branch's plans to move as many people as possible to the ceremonies from Adana and surrounding cities, the excessive amount of money spent for the ceremonies and honorary meals, the government's suspension of the National Assembly to transfer 400 deputies from Ankara to Adana, and Menderes' harsh speech against opposition media and parties.[88] In contrast, *Vatandaş*, another daily local newspaper, reflected the event as a great economic leap forward, a fruitful result of the ongoing wholistic development projects of the DP government. For *Vatandaş*, the enthusiasm of the crowd during the ceremonies was an apparent response to the 'deceptive' claims of the opposition party and its media.[89] This ceremony became one of the peak points in Demirel's professional career as well. He was very visible at every moment of the ceremony. He delivered the first speech in the official program and he was honored by President Bayar during his speech. In the end, Demirel presented a sculptured silver relief plaque of the dam and the reservoir to the representatives of the companies (See Figure 4). [90] The national newspapers covered the ceremony and related events in detail. After listing its economic benefits, it was noted as one of the five mega projects under construction, which ultimately aimed to develop economic and social conditions of rural Turkey.[91]

In the following years after the inaugural ceremony, the digging and construction of irrigation canals and marshland drainage works went on in Cilician Plains. The drained areas were annexed to cultivable fields and this incident diminished the domain of natural life in the region. The excessive use of DDT and other pesticides led many species' extinction. Moreover, the irrigation canals irreversibly broke free movement paths of local fauna and indigenous settlers and regulated passages through controlled passenger and vehicle bridges. Thus the vast Cilicia plain were demarcated by human-made waterways crossing entire region in many places.[92]

Figure 4. An instance from Seyhan Dam Dedication Ceremony on April 8, 1956. Source: DSİ archive. Note: Attendees from left to right: Celal Bayar, Süleyman Demirel, Adnan Menderes, J.B. Bonny(?) of Morrison-Knudsen Inc.

Conclusion

The investigation of the project development, finance and construction of the Seyhan Dam introduces a number of themes to discuss a new phase of the post-war Turkish experience of modernism. The main paradigm of post-war era was the political emergence and increasing visibility of rural population in Turkey after the gradual transition to multiparty system. Considering Turkish society, which was still mostly living in the villages in this period, the special attention shown for the development of rural areas in new political era was not a coincidence. To make an immediate impact and to convert social satisfaction of popular support during elections, the economic demands of the rural population had to be inserted into the political agenda and should be considered in all levels of political conflicts and negotiations. Furthermore, the political representatives of the rural population became popular figures in the mass media. They aimed at having immediate changes in daily life of villagers and consequently increasing agricultural production in short term by means of implementing nationwide agricultural reforms. In this context, the new agricultural policies originally initiated by the Republican People's Party governments in the late 1940s were eagerly inherited by DP governments after 1950 elections and even pushed further by means of mechanization of agriculture and irrigation of dry farmlands. The major problem of this

development model was the lack of long-term projections for agricultural modernization of Turkey and its integration with industry. As noted, they were mostly limited to the modernization of agricultural equipment by means of importing thousands of tractors, ploughs and harvesters instead of introducing substantial reforms for the sake of rural population in Turkey.

Planning and implementation of the Seyhan Dam in Turkey stand as a remarkable example among many development projects that states undertook in the postcolonial era. They also reveal a network of agency relations between local and international actors. The historical alignment of Turkey's dam construction projects as a part of rural development reforms with the international context in the first years the Cold Wat era enabled the realization of many largescale projects, including into the 1960s. Even though this article does not cover later rural projects, including the laying of thousands of kilometers of country roads, establishment of electrical transmission lines, distribution of public property fields to poor farmers, and drainage of marshlands and expansion of arable fields, they all radically transformed rural life in Turkey. On the other hand, the stunning modernization in the rural regions triggered an unchecked move of thousands of farmers and their families from their villages to the urban centers due to the mechanization of agriculture. Furthermore, a great part of untouched natural life was brought into exploitation for capitalist market economy. All these consequences irrevocably made nature a commodity of production and consumption relations.

The Seyhan Dam case also demonstrates a fruitful business model depending on the contribution of local and international agents in a joint-venture for operation of large-scale infrastructure projects. Soon after, this model was repeated in many other dams and other infrastructure projects in the 1950s and 1960s. In this model, while the international ones provided necessary equipment, expertise, and technical consultancy services, the local agents provided workmanship, available materials, and construction technology. This collaborative effort stimulated the existence of many modernist themes in Turkey in the 1950s such as the transfer of state-of-the-art technology and expertise to Turkey for concrete workmanship and electricity services. The expertise acquired from large-scale projects provided the local construction companies and state agents, such as DSİ, with the gradual increase in their share in work in the following years so that local companies could be used to construct many infrastructure projects without any international partnership.

Considering all these incidences, the construction of the Seyhan Dam coincides with an important period when many political economic and social changes occurred. The story of the project enables us to have better understanding of the mid-century developments in Turkey and in the region.

Notes

1. "Where History Walked" *The Em Kayan* 14, no. 10 (December 1955): 3. *The Em Kayan* was a magazine published by Morrison Knudsen and is archived at Boise State University.
2. In the architectural literature, the only exception is the Çubuk Dam, which was completed in 1936 to provide potable water for the growing new capital, Ankara. It was demonstrated as a material manifestation of modernity by means of the social facilities built nearby the dam and appropriation of the natural landscape as a public park for recreation. See Bozdoğan, *Modernism and Nation Building*, 120.
3. Öktem, "When Dams Are Built on Shaky Grounds," and Dissard, "From Shining Icons."
4. Stahl, "The Keban Dam Project."
5. Ünsal Gülmez, "Ege Taşrasında Modern'in Mitleşmesi," and Ünsal Gülmez, "Barajda Barınmak."
6. Kezer, "Spatializing Difference."
7. Berman, *All That is Solid*, 93.
8. Harvey, *Condition of Postmodernity*, 111.
9. Blackbourn, *The Conquest of Nature*, 18–19.
10. Schivelbusch, *The Railway Journey*, 53.
11. Coscrove, "An Elemental Division," 574–583.
12. Swyngedouw, "Power, Nature and the City," 311–312.
13. McCully, *Silenced Rivers*, 241.
14. Radkau, *Nature and Power*, 256.
15. Swyngedouw and Kaika, "The Environment of the City," 571.
16. Robertson, "Cold War landscapes," 429.
17. Wilson, "Machine-Age Iconography," 465.
18. Berman, *All that is Solid*, 300–301.
19. Another rural development institution, namely the Tennessee Valley Authority (TVA), was founded after the Great Depression in 1933. Its success stimulated foundation of similar agencies at global scale. For instance, based on TVA model, HAVA was founded in Helmand Valley project of Afghanistan. For a detailed investigation of the projects and American intervention in the region, see Cullather, "Damming Afghanistan," and Radkau, *Nature and Power*, 257. Tucker's article is informative to understand popularisation of TVA model at global scale. Tucker, "Containing Communism."
20. McCully, *Silenced Rivers*, 2–3.
21. Wilson, "Machine-Age Iconography," 466–467.
22. Ibid., 476, 478–479.
23. Nafia Bakanlığı Sular U. M. Fen Heyeti "Çubuk Barajı," 275–282. For architectural implications, see Bozdogan, *Modernism and Nation Building*, 120.
24. Kaika, "Dams as Symbols of Modernization," 278, 296.
25. Tucker, "Containing Communism," 142.
26. Adas, *Dominance by Design*, 207.
27. Khagram, *Dams and Development*, 7.
28. Coscrove, "An Elemental Division," 8 and Radkau, *Nature and Power*, 257.
29. For Anti-dam movements, see Van Huizen, "Building a Green Dam," 421, 436; McCully, *Silenced Rivers*, 29–64; Khagram, *Dams and Development*, 3–5; and Cummings, *Dam the Rivers*, 20–33.

30. The challenge to nature by means of building dams has been one of the popular themes in many publications. Among them see Sneddon, *Concrete Revolution*, 2–3; Steinberg, "That World's Fair Feeling," 401; and McCully, *Silenced Rivers*, 1.
31. McCully, *Silenced Rivers*, 237.
32. For a short history of damming the rivers, see McCully, *Silenced Rivers*, 12–23.
33. Cullather, "Damming Afghanistan," 520.
34. Ibid., 522.
35. Schayegh, "Iran's Karaj Dam Affair," 612–643.
36. For a detailed discussion on the construction of the Aswan Dam, see Tucker, "Containing Communism," 145–148; Robertson, "Cold War landscapes," 430; and McCully, *Silenced Rivers*, 238–239.
37. Presidential Archives of Turkey Ottoman Archive Section (OA hereafter), Y.MTV. 300/68 (June 25, 1907).
38. OA, BEO, 3627/272011 (August 30, 1909). The petition was sent by Francis Deconson & Co. who was residing in London at that time.
39. Tanoğlu, "Türkiye'de Büyük Su İşlerinin," 296.
40. The full text of the Truman Doctrine was published in Armaoğlu, *Belgelerle Türk-Amerikan*, 152–157.
41. Two of these export reports were drafted by Thornburg and Barker, which were also published and became available for public. See Thornburg, *Turkey and Economic Appraisal*, and Barker, *The Economy of Turkey*.
42. Barker, *The Economy of Turkey*, 18–20, and Keyder, *State and Class in Turkey*, 119.
43. "M.Arası Bankasının Yıllık Konferansı Açıldı" (*Yeni Sabah*, September 14, 1949). Also, Onaran, "Milletlerarasi Kalkınma Bankasindan," 254.
44. "Where History Walked" *The Em Kayan* 14, no.10 (December 1955), 4 and İşmen, "Seyhan Hidroelektrik Tesisleri," 12.
45. "Haberler" *Arkitekt*, no. 249–252 (1952), 159, and İşmen, "Seyhan Hidroelektrik Tesisleri," 11.
46. Thornburg, *Turkey and Economic Appraisal*, 217–222.
47. Presidential Archives of Turkey Republican Archive Section (RA hereafter), 30-01-0-0/88-551-1 (August 1951).
48. "Turkey Names Engineers: Selects Frederic R. Harris For Hydraulic Power" (*New York Times*, September 2, 1950).
49. (RA) 30-18-1-2/128-18-10 (March 7, 1952).
50. "World Bank Loan Agreement: Legal ISC Files, Turkey – Seyhan Project : Loan 0063."
51. Ibid., 12.
52. "Seyhan barajının finansmanı için Milletlerarası İmar ve Kalkınma Bankası ile akdedilen 18 Haziran 1952 tarihli Anlaşma ve Eklerinin onanması hakkında kanun tasarısı ve Geçici Komisyon Raporu". *TBMM Tutanak Dergisi*, 9th Term, 3rd Legislation Year, Vol. 16 (June 20, 1952): 373–376.
53. "Haberler" *Arkitekt*, no. 249–252. (1952), 158.
54. "World Bank, "Turkey – Seyhan River Multipurpose Project (English)."
55. "Seyhan Barajı Hidroelektrik santralinde enerji üretilmesi, bunun istihlâk merkezlerine nakli ve toptan satışına dair imtiyaz Sözleşmesi" Cabinet Decision no. 4/1017 (June 25, 1953) *Resmi Gazete*, no.8563: (November 21, 1953), 7622–7624.
56. "U. S. Concern Gets Turkish Dam Job: Morrison – Knudsen Awarded" (*New York Times*, Jul 6, 1953). *The New York Times* underlined financial interest of local people as:

> In a country where state direction and operation of basic industries has been accepted for more than a generation, the Seyhan development is an interesting illustration of the extent to which United States ideas of equity financing have taken hold even in a project to which United States aid has not made any direct contribution.

57. Tanyeli, "1950'lerden Bu Yana," 238–239.
58. Wilson, *Beyond Anıtkabir*, 89.
59. Aslanoğlu, *Erken Cumhuriyet Dönemi*, 283–285.
60. Orhon, "Hirfanlı Barajı ve Hidroelektrik Tesisleri," 40.
61. Yavaş, "Demirköprü Barajı Tesisleri," 22.
62. Buldam, "Sarıyar Barajı," 14.
63. Similar to General Directorate of State Highways (KGM), DSİ was structured by following their American precedent and the first technical documents were adapted by the foreign consultants. See Ünsal, *İnşaatçıların Tarihi*, 104–105.
64. Üsdiken, "Transferring American Models," 316–330.
65. "Muayyen ve Muvakkat Müddetli Hizmetlerde Çalışacak Yevmiyeli Personel Yönetmeliği" Cabinet Decision no 4/10195. (April 15, 1958). The regulation was amended and updated several times in the following years.
66. Ural and Ungan, *Large Dams in Turkey*, 53. See also (RA) 30-1-0-0/74-467-10 (March 27, 1948). This file reports the interest of International Morrison-Knudsen Inc.'s interest for project development along with TAMS. The drafters of the report recommended Morrison-Knudsen for the project development due to their prior experience and reliability in similar projects.
67. İşmen, "Seyhan Hidroelektrik Tesisleri," 11 and "Where History Walked," 4.
68. Wilson, "Machine-Age Iconography," 471.
69. For its foundation and early projects of Morrison Knudsen Inc., see. Wilson and Taylor, *The Earth Changers*, 35–37.
70. "Builders Abroad: Ambassadors with Bulldozers" (*Time*, May 3, 1954).
71. Garanti Construction was taken over by Koç Holding in 1976 and German Hochtief in 1987 and British Balfour Beatty. The company's name changed and became Garanti Koza Construction Co. It is still one of the active property developers in Turkey. For a brief account on company profile; see company official website: http://www.garantikoza.com/hakkimizda/. Accessed April 24, 2019.
72. "Seyhan Barajının Temel Atma Töreni Bugün Yapılacak" (*Cumhuriyet*, October 25, 1953); "Seyhan Barajının İnşaatına Başlandı" (*Cumhuriyet*, October 26, 1953), and "Seyhan Barajının Temel Atma Töreni Dün Yapıldı" (*Milliyet*, October 26, 1953).
73. "Refaha Doğru Yeni Bir Adım" (*Cumhuriyet*, October 26, 1953).
74. Sarpkaya, "Seyhan Barajı," 49–50.
75. The control and supervision of the construction was handled by experienced engineers: They were B.G. Falkner, Morrison-Garanti's resident partner and project manager; Harold E. Buckert, a veteran Morrison-Knudsen dam builder; Ali Orhon was resident engineer for the Ministry of Public Works and W.B. Carr was resident engineer for Knapp-Tippetts-Abbett-McCarthy, engineering consultant to the ministry. "Seyhan Dam Rises in Modern Turkey" *The Em Kayan* 13, no. 10 (December 1954), 3–5 and "Where History Walked", 3–5.
76. "Seyhan Dam at halfway in Turkey" *The Em Kayan* 14, no. 3 (May 1955), 3–5.

77. "Seyhan Dam Embarkment Topped out in Turkey" *The Em Kayan* 15, no. 2 (April 1956), 16–17. Moreover, Ural and Ungan reported that steel penstocks and surge tanks were manufactured and erected by Voest of Austria, turbines by Voith of Germany, generators by Siemens of Germany, transformers by Le Material Electrique of France and transmission lines by Elin of Austria. See Ural and Ungan, *Large Dams in Turkey*, 53.
78. Ural and Ungan, *Large Dams in Turkey*, 52–53.
79. Skidmore, Owings and Merrill (SOM) and its partner Gordon Bunshaft were known for their role in the design of the Hilton Hotel in Istanbul but they were already known by the Turkish government before that. The report was submitted to the Ministry of Public Works in December 1951. This survey had carried out in connection with the Technical Assistance Program of the Economic Cooperation Administration (ECA). The objective was to report to the Ministry of Public Works of the Republic of Turkey on the nature of the problems existing in these fields needing government attention, and to make recommendations for action that could be taken by the government both as to future investigations and appropriate future activities in these fields. Three members of the company, Gordon Bunshaft, G. L. Schmauder and David H. Hughes arrived in Turkey on 22 April 1951, and began work with the officials of the Department of Construction and Planning of the Ministry of Public Works. See Skidmore, Owings & Merrill, *Construction, Town Planning,* 22–23.
80. Tanyeli, "1950'lerden Bu Yana," 238.
81. World Bank, "Turkey – Seyhan Project," 14–15.
82. Göle, *Mühendisler ve İdeoloji*, 9, 84–85.
83. Skidmore, Owings & Merrill. *Construction, Town Planning*, 22–23.
84. Turgut, ed. *Süleyman Demirel: Bir Ömür Suyun Peşinde*, 24.
85. Turgut, *Demirel'in Dünyası*, 109.
86. Süleyman Demirel was already familiar with the Seyhan Dam project. He was in Adana in 1951 when the project developer company was conducting site analyses. He studied engineering calculations of Demirköprü, Kemer and Hirfanlı dams in 1953. For his engineering career at DSİ see Turgut, *Güniz Sokağı*, 41–47 and Turgut, ed. *Süleyman Demirel: Bir Ömür Suyun Peşinde*, 26–32. When he was in the United States with the Eisenhower Scholarship, he worked in the Bureau of Reclamation and was engaged with Morrison Knudsen Inc. during this period. After return to Turkey, he worked as local representative of this company for a while. After his illustrious rise in politics in a short time, he was frequently called as 'Morrison Süleyman' by his opponents to refer to his close relation with American companies and government.
87. "Seyhan Dam Dedication" *The Em Kayan* 15, no. 4 (June 1956), 27.
88. Some of the headlines are: "Bayar ve Menderes'i Karşılamak Üzere Hummalı Bir Faaliyet Başladı" (*Yeni Adana*, April 4, 1956); "Bayar ve Menderes'i Karşılamak İçin Hummalı Faaliyet Devam Ediyor" (*Yeni Adana*, April 6, 1956); "Seyhan Barajının Açılış Töreni Yarın Yapılacak; Tören için Sarfedilen Yüzbinlerce Lira Halkımız Arasında Üzüntü Yarattı." (*Yeni Adana*, April 7, 1956); and "Seyhan Barajı Dün Büyük Bir Törenle Açıldı: Menderes Belediye Önünde Yaptığı Konuşmada Muhalefet ve Basına Mutad Hücumlarda Bulundu." (*Yeni Adana*, April 9, 1956).
89. Some of the headlines were "İktidar'ın Hamleleri Semere Vermeye Başladı: Seyhan Barajı ve Birecik Köprüsü Nisan Başında Hizmete Girecek" (*Vatandaş,*

March 24, 1956); "Demokrat İktidarın Eserleri Hizmete Girmeye Başlamıştır", "Önümüzdeki On Gün İçinde Birçok Tesisin Açılışı Yapılacak" (*Vatandaş,* March 31, 1956); "Memleketimiz Çukurova'nın Büyük Gününe Hazırlanıyor: Mebuslarımızın Büyük Eseri Görebilmeleri İçin Meclis Tatil Yaptı." (*Vatandaş,* April 5, 1956); "Adana Tarihi Güne Yaklaşmanın Sevinci İçinde Yüzüyor" (*Vatandaş,* April 6, 1956); "Seyhan Barajı ve Santrali Memleketimize Hayırlı Olsun" "Türkiye Muazzam Bir İktisadi Kalkınma İçinde Bulunuyor" (*Vatandaş,* April 8, 1956); and "Çukurova Dün İki Bayramı Birden Kutladı" (*Vatandaş,* April 9, 1956).

90. "President's Memo: 60,000 attend Turkish Dam Celebration" *The Em Kayan* 15, no. 3 (May 1956), 1, and "Seyhan Barajı Dün Büyük Törenle Açıldı" (*Cumhuriyet*, April 9, 1956).
91. "Seyhan Barajı Bugün Açılıyor" (*Milliyet*, April 8, 1956); "Seyhan Barajı Muazzam Bir Törenle Açıldı" (*Milliyet*, April 9, 1956); and "Seyhan Barajı Dün Büyük Törenle Açıldı" (*Cumhuriyet*, April 9, 1956).
92. Keznep Kezer's article focuses on early republican period developments in Munzur Valley of Turkey, which exemplifies a remarkable case that demonstrates the dominance of human intervention over the nature by means of implementing comprehensive public works projects by the modern state apparatus. See Kezer, "Spatializing Difference," 507–527.

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