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SOMMARIO

PROCEEDINGS OF THE WORKSHOP

DROWNING LANDSCAPES: MULTIDISCIPLINARY APPROACHES TO THE ARCHAEOLOGICAL HERITAGE OF DAM RESERVOIRS

XIII ICAANE Conference

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The following papers are the results of a workshop entitled "Drowning Landscapes: Multidisciplinary Approaches to the Archaeological Heritage of Dam Reservoirs" held during the XIII ICAANE conference in Copenhagen on the 24th of May 2023 and organised by Paola Sconzo, Francesca Simi and Jesper Eidem.

We want to thank all the workshop participants and the scholars who contributed to these proceedings. We are also extremely grateful to the many reviewers who contributed to the quality of the contributions here presented.

THE EDITORS

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SUBMERGED PAST: DAM CONSTRUCTION AND CULTURAL HERITAGE PROTECTION POLICY IN IRAN

Abstract

The Iranian plateau, characterised by its scarcity of water, has seen the development of historical settlements along river valleys and water resources, while nomadic communities have determined their migration routes based on water availability and pastures. Throughout its history, the region has implemented various water management solutions, including dams, qanats, and reservoirs, all contributing to Iran's diverse cultural heritage, with some still in use today.

Since the beginning of modern dam construction in the 1950s, Iran has emerged as one of the largest dam builders in Southwest Asia. However, this extensive dam construction has brought about adverse impacts on historical and cultural sites, landscapes, and intangible heritage. For several decades, there was no specific policy addressing the preservation of cultural heritage within dam projects. Concerns raised by cultural heritage experts eventually led to the mandatory inclusion of cultural and historical impact assessments, along with rescue operations, in the overall scope of construction projects.

Despite recent rescue archaeology efforts, they have not fully met the requirements of safeguarding cultural heritage. This paper scrutinises the existing policies related to dam construction and cultural heritage in Iran, offering suggestions to enhance the integration of cultural heritage considerations into development and dam construction programmes.

Keywords

Cultural heritage, Iran, dam construction, rescue archaeology, heritage management

Introduction

Water in Iran has not only been a crucial factor for the survival and expansion of civilisations throughout history but has also held significant political and cultural importance. Control over water resources has played a pivotal role in the formation of civilisations and conflicts on the Iranian plateau. Consequently, various political powers have consistently integrated water management into their political agendas, recognising it as a strategic and promotional element.

Conversely, life in a water-scarce plateau has given rise to tangible and intangible phenomena associated with the culture of water management, many aspects of which endure to this day. The inscription of Darius the Great (550-486 BCE) on the terrace walls of Persepolis illustrates his plea to Ahuramazda to safeguard the country from hostile armies, drought, and lies. Darius's acknowledgement of water scarcity in the Iranian plateau emphasises that even 2,500 years ago, drought posed a great threat to the land, and attention to water-related issues was integral to the central policies of Persian kings as a political agenda.

Archaeological discoveries from the Lower Palaeolithic era, particularly in sites associated with river terraces and lakeshores, such as the Kashafrud River basin in Razavi Khorasan, northeastern Iran, the Karun, Kargar, Mashkid, and Ladiz Rivers in the south and southeast, Sefidrud River in the North, and Mahabad River in the northwest[1], reveal the profound connection between civilisations and water resources. Significant civilisations, like the Jiroft civilisation along the Halil River (3rd millennium BCE)[2], those in the plains of Khuzestan[3], and settlements on the fringes of the Seimareh River in Lorestan[4], developed in tandem with rivers and water resources (Figure 1). The scarcity of water and recurring droughts, if not effectively addressed, led to extensive population migrations.

In response, communities innovated by constructing qanats (underground irrigation systems), dams, and bunds for water management. These innovative water management practices, including the construction of qanats[5] and bands (dams)[6], many of which exist to this day, were strategic responses to the challenges posed by water scarcity. Historical dams, such as the Achaemenid bridge-dam of "Sang-e Dokhtar" in Dorudzan, the Achaemenid and Sassanian dams in Khuzestan, notably the Shushtar Historical Hydraulic System dating from the 3rd century CE (probably on older bases from the 5th century BCE)[7], and the medieval dams of the Kurit (also Korit/ Koreyt) in Tabas[8], the Teimurid dam of Akhlamad in Mashhad,

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[1] Biglari, Shidrang 2006, 160.
[2] Saatsaz, Rezaei 2023, 4.
[3] *Ibidem,* 4.
[4] Niakan 2018.
[5] Unesco 2016.
[6] Planhol 1988.
[7] Ichhto 2008.
[8] Aminpoor, Asadi, Sadat Bashtani 2020, 19.

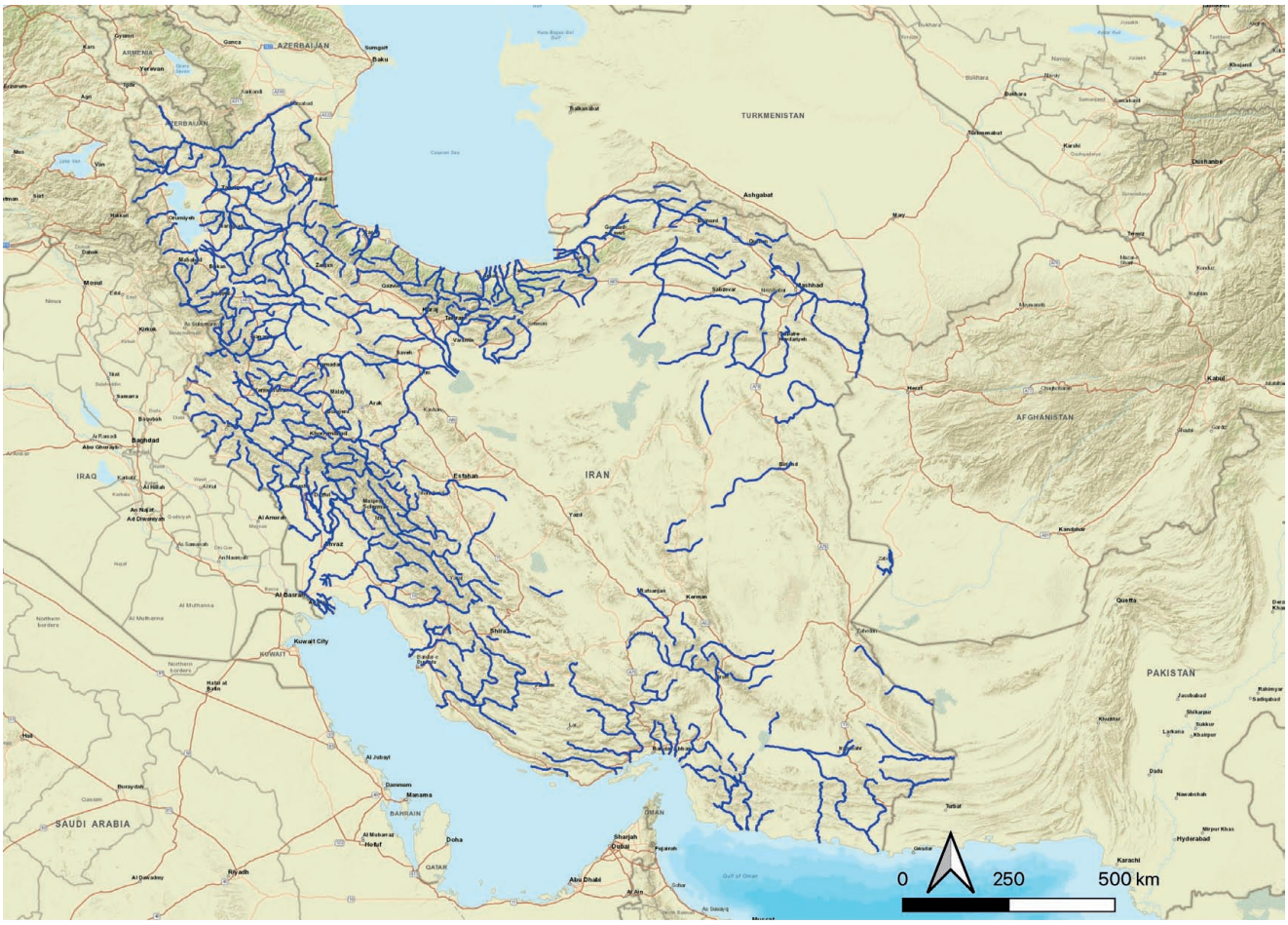

Fig. 1 - International Steering Committee for Global Mapping. Sāzmān-i Naqshah′bardārī-i Kishvar. Rivers, Iran, 2013. [Shapefile]. International Steering Committee for Global Mapping. Retrieved from https://maps.princeton.edu/catalog/stanford-qw969rj4750

Fig. 2 - Karaj (Amir Kabir) Dam featured on the 10 Rials Banknote, 1961. Source: Wikipedia.

Fig. 3 - The medal awarded to the builders of the Mohammad Reza Pahlavi Dam (Dez Dam). The bronze medal awarded to Rajabali Pourfalatoon. Source: Wikipedia.

and the Kebar Dam in Qom (c. 1300 CE)[9], were strategically positioned on the fringes of deserts in Iran. These structures were primarily designed to regulate floods, harness seasonal waters, and prevent water from escaping and going to waste in the arid desert environment.

Dam construction in contemporary Iran

This paper aims to present a comprehensive overview of the impact of dam construction policies on Iran's cultural heritage during modern times, particularly focusing on the period from the rule of Mohammad Reza Shah Pahlavi (1941-1979) onwards. The initiation of modern dam construction during this era marked its significance as a strategic element in the nation's development programmes. Under the rule of Mohammad Reza Shah and the surge in oil revenues, dam construction became emblematic of progress and development.[10] Images capturing dam construction operations adorned banknotes, stamps, and government medals, symbolising achievements and modern advancements in Iran. Notably, the Kuhrang Tunnel and Karaj Dam (later Amir Kabir Dam) images were recurrently featured in various banknote editions (Figure 2). Mohammad Reza Shah Dam (later renamed Dez Dam) also found its place on government medals awarded to the dam project managers (Figure 3). Albert Lamorisse (1922-1970), the French filmmaker and producer, was commissioned to create the documentary "The Lovers' Wind," focusing on the landscape of Iran and showcasing its historical monuments, villages, and cities, as well as development and modernisation. After he completed filming, government officials summoned him back, citing his neglect of Iran's modern and industrial facets. They requested he finalise his film by incorporating elements showcasing Iran's progress, particularly in dam construction. While attempting to capture footage of the Karaj Dam, his aircraft crashed into the reservoir, leading to his tragic death.[11] "The Lovers' Wind" combines Iranian cultural heritage with the narrative of the nation's modernisation, especially highlighting dam construction as a central aspect of Iran's development. This emphasis not only aligns with Western economic interests by presenting these dams as hallmarks of progress but also utilises the timeless essence of poetry to forge a reimagined narrative of Iran's history. This story places the Shah's modernisation projects at the core of Iran's identity, thus reinforcing the Pahlavi's legitimacy through a harmonious blend of ancient prestige and modern accomplishments.[12]

Several dams were constructed during Mohammad Reza Shah's reign, including Shah Ismail Dam on the Anarbar River (construction started in 1954), Dez Dam on the Dez River (construction started in 1959), Ekbatan Dam (formerly Shahnaz) on the Abshineh River (construction started in 1954), Karaj or Amir Kabir Dam on the Karaj River (1961), Voshmgir Dam on the Gorgan River (construction started in 1964), Karun 1 or Shahid Abbaspour Dam on the Karun River (construction started in 1965), Dam on the Zarriné-Rud River (1967), Sefidrud or Manjil Dam on the Qezel Ozan River (1967), Latian Dam on the Jajrood River (1967), Zayandehrud Dam on the Zayandehrud River (1970), Aras Dam on the Aras River (1971), and Dorudzan Dam on the Kor River (1972).[13]

After the 1979 Islamic Revolution, which marked the end of the Persian monarchy, dam construction retained its significance as a key element in the development and nation-building efforts. Numerous high-ranking government officials viewed dam construction as a vital indicator of the country's progress, often drawing comparisons with the achievements of the Pahlavi era. In an interview with ISNA News Agency, the CEO of the National Water Management Company highlighted that before the 1979 Revolution, 19 operational dams had a total volume of 13 billion cubic meters (25% of the total), providing an annual adjustable water capacity of 14 billion cubic meters. However, this capacity significantly increased to 165 reservoirs with a total volume of approximately 51 billion cubic meters (75% of the total), offering an adjustable water capacity of 37 billion cubic meters by February 2017.[14] According to information from the Ministry of Energy featured in the media, between 2011 and 2017, under the fifth development plan, 48 new dams were brought into operation.[15] Presently, Iran boasts a total of 194 dam reservoirs, with projections indicating that this number will increase to 201 by 2025. As per the International Commission on Large Dams, Iran secured the eleventh global ranking in terms of large dams by the end of 2023, holding the top position in Southwest Asia and North Africa region.[16]

Despite gaining support from many in the energy sector, extensive dam construction has faced significant criticism due to its negative impacts on the environment, water, and soil resources, which are seen as irreparable.[17] The construction of certain dams in Iran has resulted in submerging forests, landscapes, gardens, and farmlands, leading to the loss of vibrant

[9] Pashtun 2007, 43.
[10] Saatsaz 2020, 1764-1765.
[11] Naficy 1979, 229-230.
[12] Watson 2015, 58.
[13] Zolotov, Navayeneyah 1997, 324-325.
[14] Babai 2019.
[15] *Ibidem.*
[16] International Commission On Large Dams 2023.
[17] Heydari, Othman, Noori 2013.

ecosystems. The government's failure to implement watershed management plans to stabilise upstream slopes of the basins has also contributed to a reduced lifespan of dams, caused by the gradual accumulation of sediment in the reservoirs.

After the Iran-Iraq war of 1980-1988, Iran entered a period known as the 'Reconstruction Era' to repair war-related destruction and develop necessary infrastructures. The first Five-year Development Plan was approved and enacted by the Islamic Consultative Assembly in 1989, continuing the five-year development and urbanisation plans initiated earlier. These plans placed a strong emphasis on the development and expansion of water storage facilities for urban and rural consumption, electricity generation, agricultural irrigation, and industrial water supply. In this context, dam construction emerged as a key operational method to attain the aforementioned goals.

The law of the First Economic, Social, and Cultural Development Plan of the Islamic Republic of Iran, enacted in 1990, stipulated that "to maximise the utilisation of the country's water and power resources, the government is authorised to fund the construction of Karun 3, Karun 4, Karkheh, and Gavoshan dams, up to a limit of three billion (3,000,000,000) US dollars through long-term credit contracts".[18]

In the 1994 law of the second development plan, the construction of Karun 3, Karun 4, Karkheh, and Gavoshan dams was mandated.[19] In the third law, the government was obliged to construct multiple small and large dams through various feasible means with the goal of securing water resources.[20] Under the fourth development law, watershed management operations were mandated for implementation in areas where dams were under construction and in those already built.[21] Additionally, under the fifth development law of 2011, the government was mandated to expand the main and subsidiary networks of irrigation and drainage in the vicinity of constructed dams.[22] In the sixth programme law of 2017, ten percent of the annual budget of the National Development Fund was allocated to provide facilities for non-governmental investors in the agricultural sector, complementary industries within this sector, environmental issues related to agriculture and natural resources, as well as the construction of diversion dams and small dams.[23] In the seventh development plan approved in 2023 and in its eighth chapter, special emphasis has been placed on establishing an integrated water resource management system. This section requests the Ministry of Energy to coordinate with other ministries, including the Ministry of Cultural Heritage, Tourism, and Handicrafts, as well as the Department of Environment, to protect and manage wetlands and prevent unauthorised water withdrawals. However, in the chapter related to Cultural Heritage, Tourism, and Handicrafts, there is no mention of the need for coordination of other ministries with the Ministry of Cultural Heritage regarding development projects such as dam construction, leaving this issue unaddressed.[24]

Dam construction and risks to cultural and natural heritage

Despite the perceived benefits of dam construction, such as bolstering water reserves, generating electricity, expanding farmland, and enhancing fishery and water-related industries, there are significant concerns about the adverse political, social, cultural, and environmental impacts.[25]

Dam construction poses a critical strategic and political issue, historically centred around water preservation and management. This is evident in the regional significance of water, illustrated by disputes like those arising from the Helmand Dam in Afghanistan, which have underscored the strategic value of water in relations with the neighbouring country, Iran.[26]

Iran's shift to a province-based water resources management system has also increased competition over water retention within territories, notably in large basins like Karkheh and Sefidrud. This competition, driven by local and regional political motives, mirrors global conflicts over transboundary basins, potentially leading to significant socioeconomic and environmental impacts on interconnected societies and escalating further conflicts.[27]

The construction of dams brings substantial risks to cultural and natural heritage as well. In Iran, a country with a rich history of civilisations that flourished in valleys and along rivers, the building of dams has led to the submersion of archaeological sites and forced abandonment of villages with historical or prehistoric roots. These sites and settlements are emblematic of traditional knowledge tied to their geographical locations. Their abandonment not only leads to the degradation of tangible cultural heritage but also erodes intangible cultural aspects, such as knowledge of nature, traditional water management practices, and construction skills.[28]

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[18] The Islamic Consultative Assembly 1990.
[19] The Islamic Consultative Assembly 1994.
[20] The Islamic Consultative Assembly 2000.
[21] The Islamic Consultative Assembly 2004.
[22] The Islamic Consultative Assembly 2011.
[23] The Islamic Consultative Assembly 2017.
[24] The Islamic Consultative Assembly 2023.
[25] Marchetti, Zaina 2020.
[26] Abidi 1977; Aman 2016.
[27] Torabi *et alii* 2024, 245-246.
[28] Motevallian 2017; Malek Hosayni, Mirakzadeh, Lioutas 2017.

This trend exacerbates the decline of rural communities in Iran, as official statistics show an increasing shift towards urbanisation. Driven by the search for stable employment, improved living conditions, and access to urban amenities, rural populations migrate towards cities. As analysed by Fathi, urbanisation in Iran has been on the rise over the last fifty years, with the urban population exceeding two-thirds of the total population in 2011. Projections suggest that urbanisation will continue, potentially reaching 85% by 2050.[29] This shift is further fuelled by dam construction, which not only threatens natural and cultural landscapes that have witnessed millennia of human-nature coexistence but also prompts rural migration by altering climates and ecosystems.

The threat to Iran's cultural and natural heritage from dam construction is not new but has become more pronounced with recent projects. Instances like the Sivand Dam and the Seimareh Dam, completed in recent years, highlight the ongoing risk to ancient civilisations and settlements submerged in dam reservoirs. Older dams, built five or six decades ago, have yet to be fully evaluated for their impact on cultural heritage, leaving a gap in understanding the full extent of their consequences.

Cultural heritage institutional response and rescue initiatives

Early modern dams, such as Golpayegan, Amir Kabir in Karaj, Sefidroud, Dez, and Aras, lack comprehensive studies and published surveys regarding the destruction and submersion of cultural heritage during their construction and impoundment. The absence of historical documentation at the time of their construction further compounds our limited knowledge. Golpayegan Dam, considered Iran's first modern dam, had studies initiated in 1944, with construction commencing in 1947 and concluding in 1957.[30] This construction phase took place within the first decades after the 1930 enactment of the Antiquities Preservation Law. During this period, the Ministry of Culture and the Antiquities Administration concentrated on the identification and registration of key archaeological sites. However, their attention was confined to a relatively small number of significant sites, leaving many other areas within dam project zones unattended due to resource constraints. Additionally, civil society organisations dedicated to protecting cultural heritage were not well-established across the country.

During this time, Iran faced a marked lack of indigenous archaeologists, with the University of Tehran hosting the only archaeology department in the country. This shortage resulted in a dearth of professionals capable of carrying out archaeological surveys. In reaction to the continuous involvement of international archaeologists, the Iranian parliament saw the necessity for founding national archaeological bodies. Consequently, the 1940s saw the inception of the archaeology department at Tehran University. Only later, the government began awarding scholarships to archaeology students, which by the mid-1960s allowed the department to evolve into an academically robust entity staffed by experts educated in European and American universities.[31]

Analysing the statistics of registered buildings and sites on the National Heritage List highlights the evolving pace of documenting Iranian cultural heritage sites.[32] Between 1941 and 1961, a mere 89 cultural heritage sites were included on the list. The absence of a comprehensive list of cultural heritage sites from the 1940s to the 1960s contributes to the limited knowledge about the areas threatened by dam construction during that period, including the impact of Golpayegan and other early modern dams. The number of registered sites now stands at nearly thirty-five thousand, with the former head of Iran's Cultural Heritage Organisation, Seyyed Mohammad Beheshti, estimating there are over a million historical properties across Iran.[33]

Initiated in 1964 and finalised in 1972, the Darius the Great Dam (Dorudzan), situated on the Kor River in Fars Province approximately fifty kilometres northwest of Persepolis, was constructed to generate electrical power, manage floodwaters, and provide irrigation for downstream areas covering 1,100 km².[34] In close proximity to the modern dam stood the ancient Sang-e-Dokhtar dam dating back to the Achaemenid period. Shiraz University, formerly known as Pahlavi University, led a rescue operation, co-funded by Engineer Khalil Talighani, who generously allocated budgetary resources for the removal and reconstruction of the principal monument.[35] Talighani was a founder of Goodrich company in Iran. In a letter to Mehrdad Pahlbod, the then Minister of Art and Culture, he proposed a plan for a rescue operation at Dorudzan and offered a cheque of 300,000 Rials on behalf of Goodrich shareholders to support the operation.[36] The studies and relocation of the historical bridge-dam of Sang-e-Dokhtar was successfully executed by the Italian IsMEO (Italian Institute for the Middle and the Far East). This small ancient bridge dam was relocated from its original position on the eastern bank of the Kor River and was reconstructed at a new site,

[29] Fathi 2015.
[30] Noorbakhsh 2016.
[31] Papoli Yazdi, Garazhian 2012, 25.
[32] Pazooki, Shadmehr 2005.
[33] Beheshti 2001.
[34] Naderi 2020, 1554.
[35] Nicol 1970, 245.
[36] Talighani 1965, 51.

approximately three kilometres downstream in the same river valley, directly across from the modern Darius the Great Dam. The decision to relocate the bridge was prompted by the rising water level, aimed at preserving this historic structure. Examination of its blocks uncovered similarities to the Achaemenid technique employed at Persepolis.[37]

The expansive Marvdasht Plain, housing these ancient sites and monuments, stands as one of the oldest historical regions in Iran. Limited knowledge exists regarding land use in this area during ancient times, but the presence of numerous prehistoric mounds suggests a history of one of the longest and continuous habitation areas in this part of the world.[38]This plain, celebrated for its fertility and agricultural advancement facilitated by irrigation systems, stands out as one of the locations where some of the earliest historical dams on the Kor River in the Iranian Plateau were built. Four major dams (*bands*) on the Kor River in this region, tracing their origins to pre-Islamic times, played a crucial role in the primary irrigation of the Marvdasht Plain. All of them, except one, continued to be operational until the early 1970s. The historical dam that fell out of use was subsequently replaced by the Darius the Great Dam in the 1960s.[39] The dam was located near the village of Dorudzan, where the standalone historical dam in Ramjerd district existed. The water from this historical dam supplied agriculture around Persepolis.

As discussed by Marsden, the Dariush the Great Dam was initially designed and implemented to exert control over substantial portions of the Marvdasht Plain and the Ramjerd district, placing them under the jurisdiction of the government and large cooperative-affiliated companies. This initiative led to notable changes in traditional systems of water distribution, agriculture, ownership, and settlement within the region. The construction of dams triggered modifications in the irrigation management system, attracting significant attention from governmental agricultural agencies. Marvdasht experienced a rapid transformation, evolving from a small settlement into a sizable town.[40] Traditional settlements in the Marvdasht plain were typically fortified villages characterised by high mud brick square enclosures and towers. Additionally, scattered semi-subterranean stone enclosures served as the basis for the seasonal dwellings of pastoral nomads who utilised the plain during the winter.[41]

Personal efforts by Talighani to persuade the Ministry of Culture and Art and secure funding for rescue operations represent one of the earliest instances of such projects during the era of modern dam construction in Iran. During the Pahlavi era, Iran focused heavily on its ancient history, particularly the Achaemenid and Sassanian periods, highlighted by events like the 1971 Celebration of the 2,500th Anniversary of the Founding of the Persian Empire.[42] However, this period lacked an official, consistent policy to protect and salvage ancient sites amid development and dam construction projects.

After the 1979 Islamic Revolution, and even during the Iran-Iraq War (1980-1988), dam construction continued, although it gained tremendous momentum with the end of the war and the beginning of the 'Reconstruction Era'. In 1985, the Iranian Cultural Heritage Organisation (ICHO) was formed by merging several organisations, including the National Organisation for the Protection of Ancient Monuments, the Centre for Archaeological Research of Iran, the Museums Department, the Centre for Anthropology, and other organisations. The new organisation took on the responsibility of protecting, educating, and introducing Iranian cultural heritage, covering all historical and cultural periods.[43]

The Charter Law of the ICHO was approved by the Islamic Consultative Assembly in 1988, marking a significant step in the preservation of cultural heritage. The formal establishment of this organisation expanded cultural heritage activities, making it a crucial step in safeguarding heritage. Relying on its charter, the ICHO effectively participated in decisions related to the protection of historical and cultural heritage. In the section related to cultural heritage in the Islamic Penal Code, legal provisions supporting cultural heritage were enacted to prevent the destruction of cultural heritage, with various punishments specified according to the crimes committed, such as looting and intentional destruction.[44] Section J of Article 156 of the Third Development Plan mandated executive departments to "cooperate in the protection of historical and cultural structures and the prevention of their change of use".[45] This legal provision highlighted the importance of cultural heritage and its governance.

As large-scale projects progressed, potential threats and damages to historical sites increased. Therefore, Section J of Article 114 of the Fourth Development Plan mandated that the executive department carry out "identification and documentation of historical-cultural properties within the geographical area of the project" under the supervision and approval of the Cultural Heritage and Tourism Organisation.[46] This legal provision granted the ICHO the authority to oversee all large-scale projects to prevent potential negative consequences.

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[37] Ismeo 1973, 423.
[38] Frye 1984, 26.
[39] Kortum 1976, 105; Marsden 1981, 104.
[40] Marsden 1981, 87.
[41] *Ibidem*, 100.
[42] Abdi 2001.
[43] Samadi Rendi 1997, 2-9.
[44] *Ibidem*, 13-15.
[45] The Islamic Consultative Assembly 2000.
[46] The Islamic Consultative Assembly 2004.

During the initial years of the activities of the ICHO, coinciding with the Iran-Iraq War, several large dams were under construction. In 1987, the construction of the Baroon Dam posed a threat to the Dzordzor Chapel, built in the 14th century and located in the Qarasu River Valley in West Azerbaijan province of Iran. In collaboration with the Ministry of Energy and the Armenian Diocese of Iranian Azerbaijan, the ICHO relocated the chapel to a new location, 110 metres further up, and reconstructed it 600 metres away from its original location, saving it from submersion in the dam reservoir. Subsequently, in 2008, this chapel was registered as a World Heritage Site alongside other Armenian monastic ensembles in the north-west of Iran.[47]

The construction of dams and water transfer projects threatened numerous historical sites, particularly those linked to traditional water systems. As a countermeasure, the Ministry of Energy established the 'Iranian Water National Museum' in Tehran in 1995, dedicated to the research and preservation of these culturally significant sites.[48] The institution's purpose was to study, document, and preserve cultural heritage associated with water, including ancient water-related structures, qanats, and irrigation networks. It aimed to raise public awareness, preserve and restore water-related heritage, and transmit valuable knowledge to future generations.

Following the establishment of the ICHO and the enactment of the Islamic Penal Code and the Third and Fourth Development Plans, cultural heritage preservation did not adhere to a consistent pattern and pace. During the implementation of the Fourth Plan, there was relatively more cooperation among government agencies, and the supervision of heritage in large project implementations was more pronounced than in the subsequent years. In contrast to the Third and Fourth Plans, the Fifth Development Plan saw a decrease in the prominence and scope of the cultural heritage issue. While the ICHO continued to oversee large-scale projects as mandated by Section J of Article 114 of the Fourth Plan[49], its oversight was confined and primarily focused on dam construction projects.

The restructuring of the ICHO and its managerial structure had a significant impact on its heritage oversight mission. In 2003, the Iran Tourism Organisation and the ICHO merged[50], and within two years, the Handicrafts Organisation also joined this unified entity.[51] This consolidation resulted in the formation of Iran's Cultural Heritage, Handicrafts, and Tourism Organisation (ICHHTO), expanding its organisational structure. Previously, the ICHO was part of the Ministry of Science and later the Ministry of Culture and Islamic Guidance. Through integration with these organisations, it gained independence from the Ministry of Culture and Islamic Guidance, becoming an autonomous institution under the direct supervision of the President of the Islamic Republic. In 2019, the ICHHTO was further elevated to the status of the Ministry of Cultural Heritage, Tourism, and Handicrafts (MCTH)[52].

The ICHO, in its original form before merging and evolving into a ministry, functioned primarily as a research institution. This status afforded the organisation certain advantages, such as budgets not bound by the regulations governing executive government agencies, resembling the budgetary autonomy seen in universities. Moreover, individuals with higher education credentials contributed to the organisation's academic staff. However, with the amalgamation of the Iran Tourism and Handicrafts Organisations, the organisation's expansive structure underwent a transformation, shifting its emphasis from a research-oriented entity to an executive one. In response to this change, the Research Institute of Cultural Heritage and Tourism was established. This institute now oversees various research centres, with academic staff actively engaged in research activities. Notably, the Iranian Centre for Archaeological Research (ICAR)[53] operates within this framework, focusing on the rescue and preservation of sites impacted by large-scale development projects and dams.

When ICAR was established, its primary interactions and challenges were closely linked to the Ministry of Energy, particularly within the context of dam construction. The initial expectation was for ICAR, in collaboration with the Research Centre for Historical Buildings and Fabrics, to formulate comprehensive rescue and preservation programmes as one of its mandates. These programmes were envisioned to involve a thorough assessment and documentation of endangered sites before approving development projects, as well as the execution of salvage and rescue operations where necessary. However, an unexpected trend emerged as ICAR consistently engaged in negotiations on behalf of the Ministry of Cultural Heritage, Tourism, and Handicrafts (MCTH) with the Ministry of Energy and other entities. Consequently, ICAR gradually transformed into the representative of MCTH with full authority in these matters.

As a result, the overall goal of ICAR shifted and narrowed, focusing primarily on the identification, documentation, and rescue operations of sites within the scope of large development projects and dams. Unfortunately, these rescue efforts, often initiated late in the dam construction process or near completion, mainly involved documenting, preserving, and relo-

[47] ICHHTO 2007.
[48] https://iwnm.wrm.ir/?l=EN
[49] The Islamic Consultative Assembly 2004.
[50] MCTH 2024.
[51] Iran's Supreme Administrative Council 2006.
[52] MCTH 2024.
[53] https://icar.richt.ir/richt

cating movable artefacts to museum repositories. The historical and natural landscapes, as well as monuments and sites themselves, were not the main focus of these operations. This approach led the research institute to approve most dam construction projects under the condition that the project executor covers the costs of identification, documentation, and rescue operations.

This practice, repeated over time, resulted in ICAR's dependency on financial resources from ministries, particularly the Ministry of Energy. Changes in management and fluctuations in MCTH's budgets in recent years further intensified ICAR's reliance on the financial resources of the Ministry of Energy and its associated rescue and salvage programmes. This reliance, however, hindered its supervisory role with veto power in large dam construction projects that could potentially cause irreparable damage to archaeological sites, as rescue operations in approved projects could generate income.

It is crucial to note that, despite being a developing country with rapid urbanisation and infrastructure development, Iran lacks a commercial archaeological structure and cultural resource management (CRM). While commercial archaeology is not contradictory to existing laws, in practice, archaeological excavations and surveys have predominantly been monopolised by the MCTH or specific higher education institutions. This shortfall has compelled ICAR to engage in salvage and rescue operations in development projects to address pressing needs.

Although conducted salvage and rescue missions have led to the discovery of remarkable archaeological sites and the rescue of some artefacts, the narrow focus on rescuing movable objects, the absence of a coherent policy, and the lack of scientific and technical solutions for preserving non-movable heritage sites, coupled with the neglect of intangible aspects of endangered heritage, continue to overshadow the overall objectives of such efforts.

Despite a significant portion of Iranian archaeology over the past three decades being dedicated to rescue operations conducted hastily due to the accelerated growth of dam constructions, precise statistics and scientific data on rescue excavations have not been published. Public understanding of these rescue operations typically stems from a limited number of studies published by involved archaeologists or from media reports. Without detailed information on rescue and salvage operations, a thorough assessment of their success remains challenging.

In this context, while rescue archaeology in Iran has followed a global trend, especially in Southwest Asia, of aligning with infrastructure modernisation programmes that prioritise river basins, it has transformed archaeologists into development consultants. This transformation has also led to a greater focus on heritage preservation legislation, as well as some contributions to academic and scientific research.[54]

However, rescue archaeology in Iran has fallen short of elevating archaeology and cultural heritage as integral components of development plans for addressing regional planning challenges. This shortfall is attributed to its often narrow perspective, limited scope, and lack of a comprehensive strategy. Rescue archaeology in Iran aligns with global practices, notably following UNESCO's shift in focus after the extensive Nubian monument rescue operations, affected by the Aswan High Dam Project in Egypt, which were launched in 1960 and concluded in 1980. This shift emphasises the preservation of tangible sites over the implementation of a vigorous research programme. Often, this approach overlooks the cultural practices and needs of local communities in areas affected by dam construction.[55] UNESCO's approach, which prioritised the physical integrity of monuments, groups of buildings, and sites, has led archaeology at UNESCO to pivot away from its traditional focus on excavation and contextual analysis towards an almost exclusive focus on monument conservation since the 1960s. This transition, favouring technical support over comprehensive field research, has exacerbated the divide between a technocratic approach and the pursuit of sustainable development objectives[56] – a trend that has been increasingly observed in Iranian archaeology as well.

Examples of dam construction and rescue operations

The adverse impact of dam construction on cultural heritage has triggered significant social protests, particularly highlighted by the case of the Sivand Dam, completed in 2007, and located near the World Heritage site of Pasargadae in the Bolaghi Gorge.[57] The project, initially planned in 1970, experienced interruptions, with construction starting in 1992, pausing for further planning, and resuming in 2003 without consulting the then ICHO.[58] The water diversion plan for the Sivand Dam generated substantial social issues, eliciting sensitive reactions and campaigns from media outlets, cultural heritage activists, and professionals.[59] Heritage activism in Iran gained significant momentum in the 21st century, notably due to disputes surrounding the Sivand Dam's construction.[60]

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[54] Olson, Luke 2023, 15.
[55] Meskell 2018, 4.
[56] *Ibidem*, 4.
[57] Jones, Mozaffari, Jasper 2017, 6-8.
[58] *Ibidem.*
[59] Shamoradi, Abdollahzadeh, Mozaffari 2014.
[60] Mozaffari 2019, 179.

This activism showcases how heritage debates have played out across multiple media platforms, with new media like blogs and websites becoming key channels for activist communication.[61] Besides worries about the potential flooding of notable Achaemenid locations, including the Tomb of Cyrus the Great and the Royal Road, there were also concerns regarding the inundation of ancient settlements, cemeteries, iron-smelting sites, and water canals.[62] Doubts regarding the government's commitment to preserving pre-Islamic cultural heritage emerged, influenced by early post-revolutionary attitudes toward such heritage.[63]

Elevated groundwater levels in the region raised concerns about Pasargadae and the tomb of Cyrus the Great post-water diversion. Loss of historical villages, cultural landscapes, and disruption of Qashqai tribes' passage through the Bolaghi Gorge were also troubling. Environmental damage and potential hazards like earthquakes heightened sensitivity.

In response, petitions and public protests, even warning about the potential submergence of Persepolis, nearly 50 km away, took place in front of ministries and the Parliament. UNESCO and Iran called on international archaeologists, leading to several teams from countries like France, Germany, Italy, Japan, and Poland visiting the area.[64] During the rescue operations, archaeologists from Japan and Iran, under the leadership of Tsuneki and Zeidi, conducted explorations of caves and rock shelters. These sites covered a period transitioning from the Epipalaeolithic to the Early Neolithic.[65] Additional rescue archaeology activities in the Bolaghi Gorge revealed evidence of Achaemenid presence across multiple sites. Findings encompassed rural settlements, small pavilions, fortified structures, and rock-carved canals. These discoveries have offered unmatched perspectives on the rural landscape of the Achaemenid heartland.[66]However, limited time prevented a comprehensive salvage operation, and they could only conduct emergency work. This episode marked the emergence of 'rescue archaeology' as a common term in the Ministry of Energy and ICAR literature.

The Seimareh Dam archaeological rescue project in Ilam province, western Iran, exemplifies extensive rescue operations that yielded remarkable discoveries but fell short in salvaging numerous archaeological sites within the flooded area. This project, conducted prior to the construction of the Seimareh Dam, contributed to the resurgence of research into Iran's Neolithic period. This work included the excavation of the Early Neolithic site of East Chia Sabz by a team of Iranian archaeologists under the leadership of H. Darabi.[67]

The Seimareh Valley, part of Iran's historically rich landscape, hosts archaeological sites spanning prehistory to the Achaemenid, Parthian, Sassanian, and Islamic periods. The construction of a 180-meter-high concrete dam in this valley began in 2006, with the permit to fill the dam reservoir issued in 2011. The resulting lake, extending over 45 km and covering an area of 63.7 km2, boasts the capacity to generate an annual energy of 673 gigawatt-hours.[68] Despite initial dam studies in 1990, no comprehensive archaeological surveys or rescue operations were conducted or planned at that time. Rescue activities began in 2007, leading to the discovery of more than 103 archaeological sites in the Seimareh Valley, notably the Barz Ghavaleh/Qavaleh site, a significant Sassanian site in Lorestan, western Iran.[69] The subsequent selection of sites focused on those requiring urgent survey and documentation, yielding crucial insights into prehistoric, historical, and ancient periods. Following a two-year hiatus, archaeological research resumed in collaboration between the Research Institute of Cultural Heritage and Tourism and the Ministry of Energy until late 2013.[70] In late 2014, an Italian team, headed by the University of Naples, collaborated with ICAR on the archaeological site of Lelar Central in the Seimareh Dam region.[71]

While initial excavations at the Seimareh Dam uncovered 103 sites, it is believed that the true number exceeds this estimate. The identification and excavation of additional sites were hindered by several factors, such as unsuitable timing, resource shortages, and the pressing necessity to complete operations prior to the filling of the dam's reservoir.[72]After the water level receded, an opportunity for further excavation emerged. The excavation seasons produced diverse findings, including architectural remains, pottery pieces, stuccos, and glass artefacts. Unfortunately, a significant portion of the plaster and stucco decorations found within the architectural remains was lost due to submergence.[73] The rushed rescue excavations at the Seimareh Dam were inadequate and only uncovered a small portion of the extensive heritage of this vast site. Numerous significant sites, including the Sasanian Palace of Qaleh Guri in Ramavand, drowned in the dam lake. Despite assurances that dam filling would be postponed until the end of excavations, water impoundment began midway through the process, compelling archaeolo-

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[61] *Ibidem,* 188.
[62] Helwing, Seyedin 2009, 1.
[63] Rouhani 2009; Tabasi 2022, 2.
[64] Jones, Mozaffari, Jasper 2017, 13.
[65] Matthews, Fazeli Nashli 2022, 55.
[66] Atayi, Boucharlat 2009; Askari Chaverdi, Callieri 2016; Matthews, Fazeli Nashli 2022, 473.
[67] Matthews, Fazeli Nashli 2022, 55.
[68] Niakan 2016, ش.
[69] Hourshid, Mousavi Haji 2015, 106.
[70] Niakan 2016, ش.
[71] Genito, Niakan 2016, 319.
[72] Seyyedin Boroojeni 2016, 5.
[73] Hassanpoor 2016, 263.

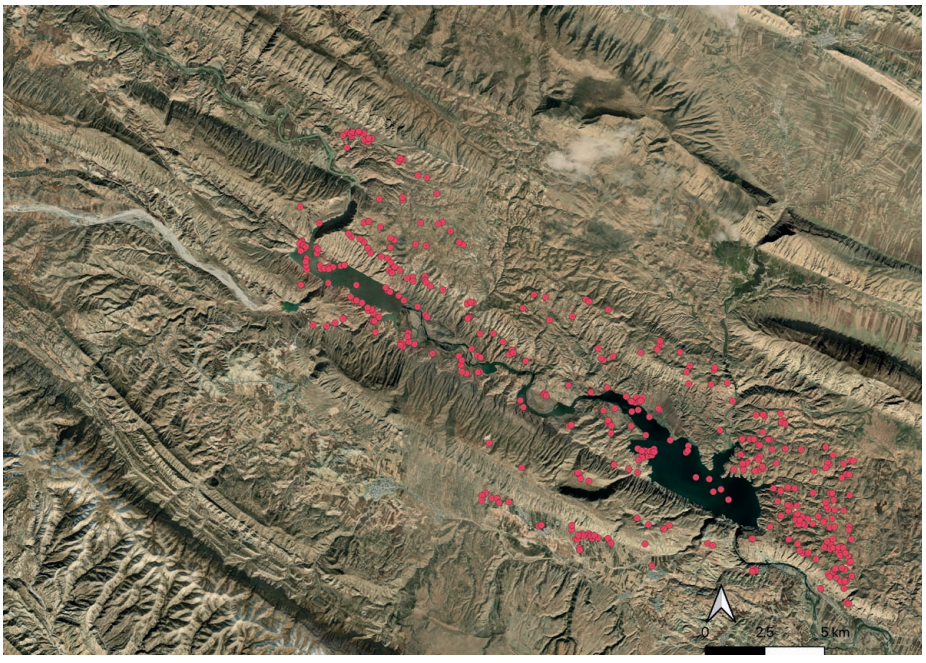

Fig. 4 - The potential heritage sites identified in the Seimareh Dam area, recorded in the EAMENA Database. https://database.eamena.org/

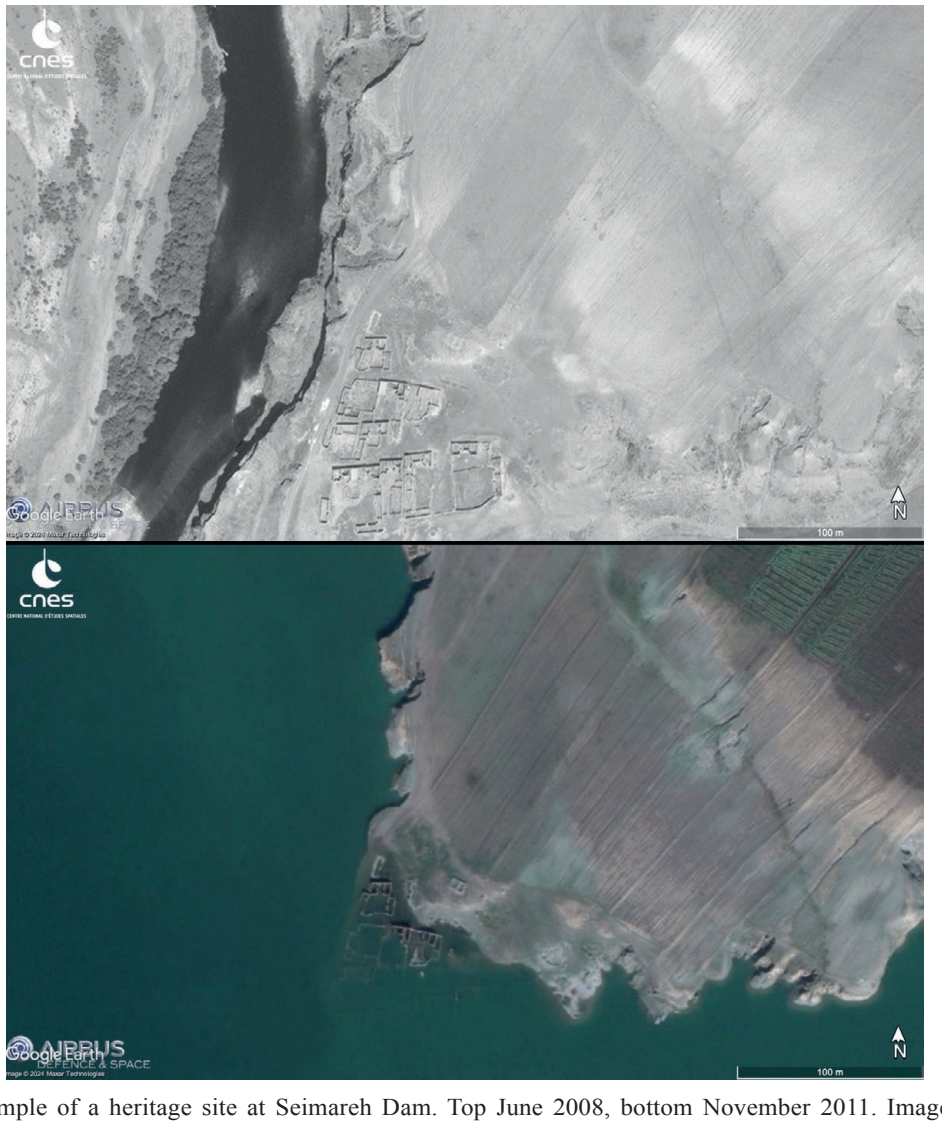

Fig. 5 - An example of a heritage site at Seimareh Dam. Top June 2008, bottom November 2011. Images © Google Earth.

gists to abandon the site. Hasanpoor, one of the archaeologists who excavated in this area, later told the media that a Sasanian city discovered alongside the palace also went underwater. Prehistoric caves dating back 12,000 years and some Neolithic sites were submerged as well.[74]

The submergence of natural landscapes, farms, orchards, and villages, followed by the forced migration of local people, has been another negative impact of this project, which has not yet received significant attention from cultural and social perspectives.[75]

Remote sensing is a highly effective technique for identifying and documenting endangered sites in dam construction and development projects, particularly for conducting rapid surveys over large areas. In Southwest Asia, remote sensing techniques have been used to examine the impacts of dam construction on cultural heritage[76] and to quantify the archaeological evidence within dam reservoir basins before dam construction.[77] In Iranian archaeology as well, some limited research has employed remote sensing methods to examine the impact of environmental changes on cultural heritage[78], to interpret the environmental characteristics of ancient landscapes[79], and also to assess various risks and damages that archaeological sites face.[80] Our analysis of diverse rescue archaeology initiatives and the corresponding published research shows that in Iran, the application of remote sensing techniques in rescue archaeology, particularly at an organisational level, is infrequent. Consequently, these techniques have not yet become significant in the emergency surveying of large areas at risk of flooding from dam projects.

The Endangered Archaeology in the Middle East and North Africa (EAMENA) project, hosted at the University of Oxford and in collaboration with the Universities of Durham and Leicester in the UK, utilises open-access satellite imagery and the web-based Arches database (https://database.eamena.org) to document endangered heritage sites across 20 countries from Afghanistan and Iran to Mauritania in the MENA region. The project has documented around 400 sites in the vicinity of the Seimareh Dam, showcasing the substantial potential of this methodology for creating accessible records of at-risk archaeological sites (Figure 4). Alarmingly, some of these recorded sites have now become submerged under the dam's reservoir (Figure 5).

The compilation of the dataset adheres to the EAMENA project's structured approach to identify and catalogue endangered archaeological sites. This process extensively employs open-access remote sensing data, predominantly from Google Earth satellite imagery, collected over time from providers, such as CNES/Airbus and Landsat/Copernicus, as well as published research and records. To ensure thorough coverage, the project area is systematically divided into grid squares, each measuring approximately 0.25 degrees by latitude and longitude, equivalent to about 25 by 27 kilometres. This gridding technique facilitates the systematic visual inspection of satellite images for each grid, enabling the detection and documentation of changes to heritage places, notably for areas impacted by the Seimareh Dam, analysed using Google Earth's historical imagery feature from 2008 to 2020.

All collected data is catalogued in the EAMENA database, which employs various resource models to detail heritage places, built components, bibliographic entries, and comprehensive condition assessments. Now in its fourth iteration, the EAMENA database serves as an advanced online geospatial platform hosted on the Arches platform. This open-source software is developed by the Getty Conservation Institute and the World Monuments Fund.

By applying the FAIR principles[81] to its online database, EAMENA enhances data management through the use of unique resource identifiers (making the data Findable), enabling open access (ensuring it is Accessible), and ensuring compliance with ontologies (making it Interoperable), which collectively make cultural heritage data shareable and Reusable.[82] The EAMENA database thus promotes collaboration, supports large-scale analysis, and aids in informed decision-making by improving data accessibility and reuse.

Discussion and conclusion

The extensive dam construction in Iran, particularly from the 1950s onwards, has catalysed a complex interplay between development objectives and the preservation of cultural heritage. This intersection presents both challenges and opportunities for enhancing the legislative framework and practices surrounding heritage conservation in the context of dam projects. Despite efforts by Iranian institutions such as ICAR, ICHHTO, and MCTH, significant gaps remain in integrating cultural heritage considerations effectively into dam construction policies and operations.

While recent developments in Iran's legal framework, such as the enactment of laws mandating the inclusion of cultural and historical impact assessments in development projects, represent progress,

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[74] Hassanpoor 2024.
[75] Seyyedin Boroojeni 2016, 5.
[76] Marchetti *et alii* 2019.
[77] Zaina, Tapete 2022.
[78] Rouhani, Huet 2024.
[79] Mortazavi, Mosapour Negari, Khosravi 2015.
[80] Zaina, Nabati Mazloumi 2021.
[81] https://www.go-fair.org/fair-principles/ (Accessed 08 April 2024)
[82] Rouhani, Huet 2024, 2.

there is still considerable room for enhancement. Legislation should explicitly require the integration of cultural heritage preservation into the lifecycle of dam projects, from planning and design to implementation. This integration could include mandating comprehensive cultural heritage impact assessments before project approval, establishing clear protocols for rescue archaeology, and ensuring adequate funding and resources for these activities. Furthermore, policies should facilitate the establishment of interdisciplinary teams comprising archaeologists, ecologists, engineers, and social scientists to ensure a holistic assessment and management of projects.

One of the critical shortcomings identified is the reactive nature of cultural heritage preservation efforts, often initiated in the later stages of dam construction. This approach has resulted in rushed and sometimes inadequate rescue operations, leading to the irreversible loss of both tangible and intangible heritage. The discussion underscores the necessity of embedding cultural heritage considerations into the early planning phases of dam projects, advocating for a proactive and integrated approach.

There is a need for a stronger research agenda that not only focuses on emergency rescue operations but also invests in understanding the broader impacts of dam construction on cultural landscapes. Incorporating heritage in sustainable development plans emerges as a pivotal strategy. This involves considering cultural heritage as an integral component of the environmental impact assessments (EIAs) for dams, ensuring that heritage preservation is not an afterthought but a fundamental consideration from the project's inception.

Intangible cultural heritage, including traditional knowledge systems and practices, is often inextricably linked with the physical landscape. The submergence of landscapes due to dam construction risks erasing these vital cultural narratives and identities. Highlighting the importance of intangible and living heritage, the paper advocates for a more inclusive approach to stakeholder consultation. The current approach, primarily focused on physical rescue operations, often overlooks the multifaceted impacts of dam projects on cultural landscapes and the social fabric of affected communities. This oversight calls for a broader, more holistic framework that encompasses not only the preservation of physical sites and artefacts but also the safeguarding of intangible cultural heritage and the well-being of local communities. Engaging local communities and stakeholders in the planning of dam projects is crucial. This engagement should aim to understand and incorporate their needs, values, cultures, and knowledge, particularly in relation to traditional water management systems and practices, into dam construction and heritage preservation efforts.

The advancement in remote sensing, online databases, and GIS technologies offers unprecedented opportunities for the identification, documentation, and monitoring of heritage sites. The adoption of these technologies should be accelerated and integrated into a national strategy for cultural heritage preservation in the context of development projects. This strategy could involve the creation of a centralised, accessible digital repository of heritage sites, incorporating both tangible and intangible aspects. Such a repository would not only facilitate the planning and implementation of dam construction projects but also enhance public awareness and education on Iran's cultural heritage.

Addressing the challenges posed by dam construction to cultural heritage preservation requires building institutional and professional capacity within Iran. This involves not only training in advanced archaeological and conservation techniques but also in project management, community engagement, and impact assessment methodologies. Establishing partnerships with international organisations, academic institutions, and NGOs could facilitate knowledge exchange and capacity building, offering Iranian professionals exposure to global best practices in heritage preservation.

In reimagining the approach to dam construction and cultural heritage preservation in Iran, it is clear that a shift towards more integrated, participatory, and technologically enabled practices is necessary. By embedding cultural heritage considerations into the DNA of development projects, engaging local communities as active stakeholders, and leveraging modern technologies for heritage documentation, Iran can navigate the path towards sustainable development that honours and preserves its rich cultural heritage. This comprehensive approach not only addresses the immediate impacts of dam construction on cultural heritage but also contributes to the long-term resilience and sustainability of Iran's cultural landscapes and communities.

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Farhad Nazari (1975-2024) passed away during the final stages of preparing this article. He dedicated over 20 years of his career to researching and actively protecting cultural heritage in Iran, both as a researcher and a heritage professional. RIP.

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