

Orontes River Basin: Downstream Challenges and Prospects for Cooperation

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1 Introduction

The Middle East is one of the most water scarce regions of the world. This is why water issues have - among other factors - influenced the countries' relationship. Turkey, which is considered a relatively water-abundant country if compared with her southern neighbours, had not considered water as a major foreign policy issue until the 1960s. Following Turkey's initiation of water development projects on the Euphrates and Tigris Rivers in mid-1970s and during the 1980s, transboundary water issues emerged as a Turkish foreign policy concern, particularly in her relations with Syria.

The Orontes River, which is called "Asi" and "Nahr al-Asi" in Turkish and Arabic respectively, is among the controversial waters that Ankara and Damascus had been arguing about. It passes through three countries' territories, i.e. Lebanon (upstream), Syria (midstream) and Turkey (downstream) where it discharges into the Mediterranean Sea. While Lebanon and Syria have settled their issues on water allocation, Turkey and Syria have yet to find a consensus.

Both countries have yet to agree on the status of the rivers concerned. The official Turkish argument is that rivers which cut across Turkey are "transboundary" waters over which Turkey claims sovereign rights while emphasising the principle of "equitable utilization". Syria, on the other hand, puts forward the argument that these are "international rivers" the waters of which should be "shared".

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This rhetoric coupled with other political issues such as Syria's territorial claims over Hatay (a southern province of Turkey) and Syria's support of the terrorist organization PKK (Partia Karkeren Kurdistan- Kurdistan Workers' Party) against which Turkey has been fighting for a long time, subsequently led to a long-term hostile atmosphere (see Turan in this volume).

Because of Syria's policy of harbouring the Kurdistan Worker's Party (PKK), the two countries' relations have been very tense. The 1990s witnessed a serious crisis between Turkey and Syria: it reached a breaking point in 1996 when Ankara decided to suspend all official relations with Damascus, following Syria's refusal to expel the PKK leader Abdullah Ocalan, after Turkey's official request to do so. However, Syria's support of the PKK which had almost brought the two states to the edge of war, started to change in 1998 with the signing of the Adana Security Protocol. Bashar Assad's ascension to presidency in 2000 can be regarded as the beginning of a relatively peaceful period between these two neighbours. Since then, although the two countries have not launched fully fledged cooperation regarding water issues, they have achieved significant cooperation in agriculture, transportation, energy, health and environment. Thus, the positive atmosphere which began with the presidency of young Assad also enabled some progress regarding the solution of the water problem. A joint dam project which is planned to be built on the Orontes River by the two countries indicates the countries' rapprochement concerning water.

2 Hydro-geographical features of the Orontes River

Rising in Lebanon in the springs of Labweh near the city of Baalbek in the northern part of the Bekaa Valley, the Orontes flows in a northerly direction, parallel to the coast and the Lebanon and anti-Lebanon Mountains, enters Syrian territory near the town of Hermel and drains into the Qattaneh reservoir. It then passes through the cities of Homs and Hamah, and crosses the fertile Al-Ghab region. As it forms the Turkish-Syrian border for 31km, it flows into Turkey and discharges into the Mediterranean Sea in the Turkish province of Hatay. Out of its total length of 448km, 35km are in Lebanon, 325km in Syria, and 88km in Turkey (Arisoy and Turkoglu 1998).¹ The catchment area covers 37,900 square kilometers of which 49.94 percent lie in Turkey, 44.32 percent in Syria and 5.74 percent in Lebanon (TFDD 2002). The Afrin River which is the major tributary of the Orontes, and the Karasu River rise in the northern part of the basin, namely in the Akcadag, Karadag and Sof mountains in Turkey. While the Karasu flows through Turkish territory and forms the border between Turkey and Syria for a short distance, the Afrin crosses Syrian territory before it re-enters Turkey and flows into Lake Amik (see map).

¹According to Bazza and Najib, its total length is 485km, of which 336km are within Syria (2003, 7).

The three rivers – Orontes, Afrin, Karasu – have an estimated combined mean annual discharge potential of 2.4 billion cubic meters (BCM). When the Orontes River enters Turkey it has a yearly potential of 1.4 BCM, the potential of Karasu is 0.4 BCM/year, and the annual discharge rate of the Afrin River is 0.6 BCM/year (Fakioglu 2010).

3 Water resources development in the riparian countries

The water of the Orontes River and its tributaries are intensively used in all riparian countries for irrigation purposes, domestic water supply and to service industry. However, the main strain on water resources comes from Syria's and Turkey's unilateral development plans to expand irrigated areas, and from Syria discharging untreated industrial and domestic wastewater into the river making downstream use problematic. Figure 1 shows a map of the Orontes River, its main tributaries and selected dams, and Table 1 provides an overview of the context for cooperation on the river.

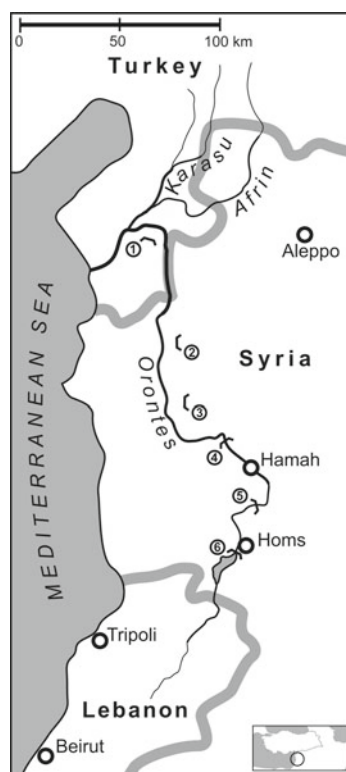


Fig. 1 Map of the Orontes River with its main tributaries, and selected dams

- (1) Yarseli Dam (5) Al Rastan Dam
- (2) Zeizoun Dam (6) Qattaneh Dam
- (3) Afamia Dam
- (4) Mahardeh Dam

Table 1 Cooperational context in the Orontes RiverOrontes basin area: 37,900 km²; mean annual discharge 2.8 BCM

Riparian Position	Basin area (percent of total) Contribution to annual discharge	Main water uses
Lebanon	2,175 km ² (6 percent)	Domestic water supply, irrigation, hydropower
Upstream	0.3 BCM (11 percent)	
Syria	16,797 km ² (44 percent)	Domestic water supply, irrigation, hydropower
mid-stream	1.2 BCM (43 percent)	
Turkey	18,972 km ² (50 percent)	Domestic water supply, irrigation, hydropower, flood control
Downstream	1.3 BCM (46 percent)	

Agreements and covered issues

Turkey - Syria	1939 – demarcation of the Thalweg of the rivers as the border 2004 – Free Trade Agreement 2004 – start of planning joint dam project 2007 – Turkish Energy Minister, Syrian Water Works Minister and Iraqi Water Resources Minister met in January and agreed to conduct periodic meetings of the Joint Technical Committee 2007 – JTC met in May 2008 – JTC met in January 2009 – 23-24 December, Turkey and Syria signed at the first meeting of the High-Level Strategic Cooperation Council in Damascus the Memorandum of Understanding related to construction of the joint (Friendship) dam 2008/09 – installation of two modernized flow measuring stations in Syria by Turkey to facture early warning
Syria - Lebanon	1994 - allocation of water (80 MCM/year for Lebanon)

Unsettled issues

Quantity	No agreement between Syria and Turkey on water allocation, and no joint contingency plan (Syrian Zeizoun dam break in 2002)
Quality	Not addressed

Lebanon

Lebanon, which has a typically Mediterranean climate with heavy winter rains and dry and arid conditions during the rest of the year, is in a relatively favourable position as far as rainfall and water resources are concerned. However, water is not available during the dry summer months. Lebanon's main sources of irrigation waters are the Litani River and the Litani-Awali water resource system, not the Orontes. In fact, Lebanon uses relatively little water for irrigation from the Orontes. Country-wide, 87,500 hectares are irrigated with surface water (as of 1993), of which about 11,500 hectares are located in Northern Lebanon.² According to the bilateral agreement signed in 1994 between Lebanon and Syria concerning the

²Detailed data on water uses from the Orontes river are not available.

sharing of Orontes' waters, Lebanon's annual share amounts to 80 million cubic meters (MCM) out of 420 (or 510) MCM.³

Lebanon plans to build a multi-purpose dam on the Orontes River, the project's objectives being as follows: (i) to supply water to the cities of Hermel and Baalbek; (ii) to provide irrigation water for 6,100 hectares of land; (iii) to construct the Asi Dam to irrigate land in the Bekaa Valley, and (iv) to install a hydropower plant. Syria objected to the project at the beginning, but later conceded. However, it has still not been implemented due to a lack of finance (Canatan 2003, 11-12).

Syria

Syria has heavily developed surface (and ground) water resources in the Orontes basin where annual rainfall ranges between 300 and 800mm, and annual evaporation between 1,200 and 2,000mm. Unlike the rest of the country, harnessing the water of the Orontes started during the French Mandate (1930s) and was given further impetus with Decree No.3 of 1972, which initiated the construction of multipurpose dams. In the 1950s, Syria started to systemically drain the Al-Ghab marshes in order to open up land for irrigation. The Orontes River bed was enlarged and deepened, and dams were built to regulate the flow of the river and to provide water for irrigation. The Al-Ghab Project was carried out between 1958 and 1967 and covered 46,000 hectares. The project was considered very important for Syria's economy, as it allowed the further settlement of farmers in the region.

According to a World Bank study (World Bank 2001), the Orontes provides 20 percent of Syria's total estimated water use volume (and 8 percent of Syria's overall water supply) and ranks second to the Euphrates River (Daoudy 2006, 44). The same study notes that water use per sector from the Orontes is as follows: agriculture 82 percent, domestic water supply 8 percent and industry 10 percent.

Targeting at food security, the opening up of land for irrigation has been a means to achieve it, and policies have prioritized water allocation for agriculture. Figures given by Daoudy show that in the early 2000s, agriculture (not only in the Orontes basin) received more than 90 percent, dropped to 80 percent during a severe drought lasting from 1999 to 2000, and recovered to 89 percent from 2000 onward until 2006 (Daoudy 2006, 42).

Syria has built a number of dams on the Orontes River with a total storage capacity of 736 MCM, such as the Al-Rastan Dam, the Qattaneh reservoir, the Mahardeh Dam, the Afamia dams and the Zeizoun Dam. The large Homs-Hama canal which starts from the Qattaneh reservoir provides water for 23,000 hectares of land; the Mahardeh reservoir supplies water to the Asharneh plain, and the Rastan reservoir irrigates areas in the Asharneh and Al-Ghab plains. After completion, the

³The FAO Aquastat Database estimates surface water flow to Syria at 510 MCM/year through the Orontes River and the bordering El Kebir river (FAO Aquastat 2008).

Afamia, Zeizoun and Kastoun dams will provide water for another 72,000 hectares. However, it is said that the cumulated reservoir capacities still do not satisfy demand, and groundwater is pumped for irrigating another 20,000 hectares.⁴

Turkey

In the early 1940s, the Amik Lake had a few natural drainage canals and consequently fields and nearby villages were frequently flooded. Hence, in the early 1970s - through the drainage and land reclamation works of the General Directorate of State Hydraulic Works (DSI) – by draining of the Amik Lake, the Amik Plain developed into a significant agriculture asset in the region. However, shortcomings in the drainage works undertaken in the 1970s resulted in continuous flooding.

There are twelve development projects in the Turkish part of the Orontes basin including its tributaries, four of which are in operation, two under construction and six in the investigation phase. The projects are designed to regulate the flow of the river and its tributaries in order to provide water for irrigation, domestic needs, to generate hydropower and to protect land and settlements from floods (Kibaroglu et al. 2005).

The projects in operation irrigate 14,067 hectares of land and produce 17.0 GWh/year of energy with a capacity of 3.30 MW. The projects currently under construction will irrigate 8,019 hectares and provide 0.95 MCM/year of drinking water. The planned projects will irrigate 77,489 hectares, protect 20,000 hectares of land from floods, provide 36.43 MCM drinking water per year, and, with an installed capacity of 1.60 MW, produce about 62.77 GWh/year. If the projects under construction and in planning are implemented, the total irrigated area will cover 99,575 hectares, 180 GWh/year of energy will be produced, 37 MCM/year drinking water will be provided, and 20,000 hectares will be protected from floods.

However, Turkish authorities argue that these plans cannot be realized with the amount of water they currently receive from Syria: “Syria has been making use of 90 percent of the total flow which reaches an annual average of 1.2 BCM at the border. Out of this total capacity, only a meagre amount of 120 MCM enters Turkey, after it has been heavily used by Syria. This amount will further decrease to the range of 25 MCM if the planned reservoirs of Ziezoun and Kastoun in Syria are built and start operation” (Ministry of Foreign Affairs 1996). The Syrian irrigation schemes referred to are the Hama-Homs (20,000 hectares) and the Al-Ghab (70,000 hectares). Furthermore, Syria might be able to satisfy its drinking water and hydro-power demands with the Jisr el Shugur Embankment, the Al-Rastan, Mahardan, Zeizoun and Kastoun dams on the Orontes.

⁴All figures either related to irrigated area, storage capacity, overall water availability and use, have to be taken with care.

4 Status of cooperation

So far, conflicts over the use of the Orontes' waters occurred between Turkey (downstream) and Syria (midstream). From the Turkish point of view, the present challenge to cooperation stem from agricultural water demand and planned irrigation projects in both countries, and from the quality of water when it enters Turkey. The chronological record of bilateral cooperation between the riparian countries reads as follows:

On 19 May 1939, Turkey and Syria signed the *Final Protocol to Determine Syria-Hatay Border Limitation* which stipulated that the waters of the rivers (i.e. Orontes, Karasu and Afrin), where they constitute the boundary between Syria and Turkey, will be utilised in an equal manner. The Thalweg lines⁵ of the rivers should demarcate the Turkish-Syrian border (Inan 1994) but no specifications were made on how to use the rivers' waters.

In 1950, Syria approached the World Bank to obtain funding for the Al-Ghab Project. An agreement was signed between the two parties in the same year. The World Bank assumed that water usage in the Orontes river basin would not be jeopardised as a result of the project, and that the control of winter floods would be beneficial for all riparians, while the summer flow would provide enough water to irrigate all areas in the region. However, the World Bank also considered the concerns of the Turkish side and organised a meeting between Turkish and Syrian experts in Syria. On this occasion, the Turkish representatives claimed that Turkey would face frequent floods during construction, and that the project would leave no water for Turkey during irrigation seasons.

In 1962, Syria assigned the development of the Orontes River project to the Dutch company Netherlands Engineering Consultants NEDECO. According to Caponera (1993), the plan was drafted without taking Turkish needs into consideration. During a meeting between the engineers of the two riparian states, the Turkish delegation offered a draft protocol which stated that a river basin development plan for the whole basin should be developed to include measures to mitigate flood hazards, to study the feasibility of a dam on the border to irrigate the Amik Plateau and to install flood warning systems in the basin. However, the meeting ended without agreement.

In the same year, a Syrian-Lebanese joint committee was established to deal with the Orontes. The committee in question allocated 100 MCM/year for Hermel and Ka'a regions in Lebanon. However, in a meeting which was held later in 1968, the committee decided to re-consider the annual water needs of both countries. As a result, Syria offered to build a complex of dams and embankments within her borders in order to facilitate Lebanon's water management. Although Syria and Lebanon decided in 1972 to annually allocate 80 MCM to Lebanon, this agreement never became operative (Salha 1995). However, on 20 September 1994 *Bilateral Agreement Concerning the Usage and Sharing of the Waters of the Al-Asi River*

⁵Thalweg is the line following the lowest part of a valley, whether under water or not.

(*Orontes*) between the Syrian Arab Republic and the Lebanese Republic, 80 MCM/year were earmarked for Lebanon (Ministry of Foreign Affairs 1996). Its major points are:

- Both countries agreed to consider the Orontes River as “common waters”
- The headspring of the river and the boundaries of the headspring area were defined together with the average annual discharge (403 and 420 MCM)
- Lebanon’s annual share of the river is 80 and Syria’s 340 MCM/year
- It was agreed that in case the annual discharge of the river falls below 400 MCM, Lebanon’s share will be proportionally reduced
- The control and management of the river’s flow within Lebanese territory was assigned to a technical committee to be formed by both countries
- The management of the headspring and the tributaries of the river within Lebanese territory would be under the responsibility of both countries, although it was to be financed by Syria only. The supervision of the parties’ commitment to the agreement was to be left to a joint arbitrary committee. In cases in which this committee fails to solve any conflict, the problem would be transferred to a higher committee to be established then
- All the artesian wells and facilities existent on the Lebanese part of the river basin as of 24 September 1994 would be counted. Syria would be notified about any further installations and related usage, and the amount of water used from these wells would be reduced from Lebanon’s share of 80 MCM (Canatan 2003, 82).

Turkish bureaucrats and the Turkish public alike reacted critically to this agreement because downstream Turkey was excluded, and were neither notified nor consulted (Salha 1995).

Negotiations between Turkey and Syria were more complicated than the relations between Syria and Lebanon for the following reasons:

Since the start of negotiations between Turkey, Syria and Iraq under the mandate of the Joint Technical Committee in the early 1980s, Turkey and Syria adopted conflicting strategies with regard to the subject of negotiation (see Kibaroglu and Scheumann in this volume). While Turkey insisted that negotiations would encompass all regional transboundary waters including the Orontes, the Euphrates and the Tigris, Syria refused to formally discuss the Orontes River with Turkey. Since Syria claimed the Turkish province of Hatay – through which the Orontes River flows and discharges into the Mediterranean – as Syrian territory,⁶ Syria regarded the Orontes River as a ‘national river’ which flows on Syrian territory and drains into the Mediterranean Sea without crossing Turkey. Any negotiation would have been tantamount to acknowledging Turkey’s sovereignty over the Hatay region.

However, since the signing of the Adana Security Protocol between Turkey and Syria in October 1998, there have been a number of promising mutual official visits

⁶Until recently, Syria claimed the former Ottoman sub-province of Alexandretta (presently the Turkish province of Hatay) as Syrian territory. Hatay appeared as part of Syria on all official Syrian maps, and consequently the Orontes River was regarded as an internal affair of Syria.

which indicate an improved bilateral dialogue and a new trust in the region (Scheumann 2003; Altunisik and Tur 2006). As a result of this rather recent rapprochement, the two riparians have further improved their economic relations and have signed the first Free Trade Agreement on 22 December 2004 which actually recognizes state boundaries (Sagsen 2006). During the official visit of the Syrian President Bashar Assad to Turkey in 2004 (the first visit ever made by a Syrian president), the two countries recognized the borders of each other with the *Agreement on Avoidance of Double Taxation and Agreement on Reciprocal Promotion and Protection of Investment* (FERB 2004). These trade agreements with corresponding assurances to open Syrian trade missions in Hatay were considered to imply de facto recognition of the current border. Turkish authorities interpret the signing of the Free Trade Agreement as Syria's acknowledgment and recognition of Turkey's borders including the province of Hatay. A Turkish diplomatic source said that Damascus lifted its reservations to signing the trade deal after an "accord" was reached on affirming Turkey's sovereignty in the southern province of Hatay, formerly Alexandretta, to which Syria had claims.⁷

Syrian Information Minister Mahdi Dakhil-Allah expects to double the size of bilateral trade which currently stands at around US\$1 billion annually. Better trade ties with Syria would open up the Arab markets for Turkey (FTA 2004). Furthermore, there has been considerable progress about the possibility of opening a Syrian consulate in Gaziantep, a Turkish province in southeast Anatolia.

During Erdogan's visit to Syria in 2004, the press recorded that the Turkish Prime Minister indicated his cooperation, and promised technical assistance to the Syrian Prime Minister Otari. He further proposed a joint dam project to be built on the Orontes River, on which both sides reached a concord.⁸ The purpose of this dam would be to provide water to irrigate 20,000 hectares in Turkey and 10,000 hectares in Syria, to produce hydropower for Turkish and Syrian needs and to improve flood control (Sen and Celik 2004; Radikal 2004). It was agreed that a joint technical delegation would be formed to study the technical issues pertaining to the construction of the joint dam. A Turkish-Syrian delegation visited the Orontes basin in Syria to examine the topographical and geological characteristics of the region as well as the places likely to be affected by the dam's construction (DSI 2005). As a result of these studies, certain sites have been identified for the construction of the dam (DSI 2006).

On December 23 and 24, 2009 Turkey and Syria signed at the first meeting of the High-Level Strategic Cooperation Council in Damascus, 50 agreements including four Memoranda of Understanding related to water. One was the Memorandum of Understanding between the Government of the Republic of Turkey and the Government of the Syrian Arab Republic for the Construction of a Joint Dam on the Orontes River Under the Name "Friendship Dam". According to this, both

⁷Hürriyet Daily News 14 April 2005. <http://www.hurriyetdailynews.com/h.php?news=turkish-syrian-summit-affirms-historic-changes-in-the-region-2005-04-14>. Accessed 15 December 2009.

⁸Hürriyet Daily News 2 January 2005. <http://www.hurriyetdailynews.com/h.php?news=prime-minister-erdogan8217s-return-visit-to-syria-2005-01-02>. Accessed 15 December 2009.

countries will meet the costs of the dam. Although the details of the dam will be ironed out in the feasibility study, its height may reach 15m and its storage capacity about 110 MCM. Of that total, 40 MCM will be used to prevent flooding and the rest for energy production and irrigation. The foundation of the dam will be laid in 2010. As part of the technical cooperation, both sides agreed to install and operate modernised flow measuring stations that serve as early warning mechanisms.

5 Outstanding issues and prospects for cooperation

The present challenge for cooperation between Syria and Turkey on the Orontes' waters stem from conflicting agricultural water demands, planned irrigation projects in both countries and the quality of the water which arrives in Turkey. At present, basic data relating to water resource potential and actual water use in both riparian countries is still contested. An agreement has yet to be reached on how to arrive at water sharing and harmonisation of national development plans. The issue of water quality requires heavy investment in water treatment facilities since, until recently, Syria was virtually without domestic wastewater treatment facilities and untreated wastewater was disposed of directly into rivers (World Bank 2001, 33).⁹ Organic pollution concentrations and levels of ammonia were dangerously high, and the rivers' ecosystem is seriously deteriorated.

It seems that the proposed joint *Orontes Friendship Dam* will materialise. One may hope that the seeds of cooperation observed in the Orontes river basin may pave the way for further confidence-building measures between Turkey and Syria.

Concerns over water quality and nature protection are not addressed at the regional level although the waters reaching the Orontes Delta located in Turkey are heavily polluted. Waste from an oil refinery built in 1957 near the Qattineh reservoir, discharges from a fertilizer factory built in 1976 in the west of the Qattineh reservoir near the city of Homs, wastewater from other industrial complexes, return flows from agricultural lands and the discharge of untreated wastewater from the city of Homs are major contaminating sources. In places where the river is used for domestic needs and irrigation, epidemics such as typhoid, dysentery and cholera have been observed. Near Hamah, where the villagers are dependent on the river to satisfy their water needs, 90 percent of diseases observed are water-borne (Canatan 2003, 28), a fact Syrian authorities and experts are well aware of.¹⁰ Since polluted waters cross the Turkish - Syrian border, Turkish authorities warned Syria via diplomatic channels and demanded the treatment of these waters before they enter Turkish territory (DSI 2006).

⁹Canatan (2003, Annex 6) lists industrial plants which discharge untreated waste water into the Orontes; the list includes e.g. sugar processing industry, plastic, textile, ceramics, concrete, and steel.

¹⁰Yahia Bakour, for instance, the General Director of the Arab Region Center for Agricultural and Developmental Studies and Consultancy (ARCADSAC) (see Bakour 1992)

The Mediterranean Association to Save the Sea Turtles (MEDASSET) has proposed to protect a coastal strip, which includes the Orontes Delta (Turkish territory), as a breeding grounds for the Green Turtle (*Chelonia mydas*). The MEDASSET report to the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats proposed the protection (in particular) of the beaches to the north and south of the mouth of the Orontes River where the highest nesting density can be found (MEDASSET 2003). If supported by Turkish authorities, the MEDASSET initiative may have repercussions for in-stream water flows and on water quality.

A further field of cooperation is the joint development of contingency plans for responding to emergencies and an early warning system in order to notify of either a natural or man-made disaster. One such example is the burst of the Syrian Zeizoun Dam in June 2002. The water held behind the dam (about 70 MCM) not only submerged five Syrian villages and destroyed the livelihood of around 10,000 Syrian people, but flooded some 1,200 hectares of cultivated land in Turkey, and submerged a large area of the town Altinozu (AFP 2002).

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