

Article

Syrian Refugees, Water Scarcity, and Dynamic Policies: How Do the New Refugee Discourses Impact Water Governance Debates in Lebanon and Jordan?

Hussam Hussein ^{1,2,*}, Alberto Natta ³, Abed Al Kareem Yehya ⁴ and Baha Hamadna ⁵

¹ Department of Politics and International Relations (DPIR), University of Oxford, Manor Road, Oxford OX1 3UQ, UK

² International Agricultural Policy and Environmental Governance, Faculty of Organic Agricultural Sciences, University of Kassel, 37213 Witzenhausen, Germany

³ United Nations Development Program, Regional Bureau for Arab States, Amman 11194, Jordan; alberto.natta@gmail.com

⁴ Food Security Program, Faculty of Agricultural and Food Sciences, American University of Beirut, Beirut 1103, Lebanon; ay27@aub.edu.lb

⁵ Political Sciences and Public Administration, Faculty of Arts and Sciences, American University of Beirut, Beirut 1103, Lebanon; bah26@mail.aub.edu

* Correspondence: hh.hussam.hussein@gmail.com

Received: 26 November 2019; Accepted: 20 January 2020; Published: 22 January 2020

Abstract: Since the Syrian crisis and the so-called “Arab Spring”, new discourses have been created, sparking the discursive water governance debates around water scarcity and hydropolitics. In Lebanon and Jordan—where most water resources are transboundary, and where most Syrian refugees have flown in—new discourses of climate change and especially of Syrian refugees as exacerbating water scarcity are emerging, shaping water governance debates. The aim of this paper is to engage in comparative discourse analysis about narratives of water crises and refugees in Lebanon and Jordan. This study is novel because of the focus on the new discourse of refugees in relation to water governance debates in both Lebanon and Jordan. This paper finds that in both countries the new discourses of refugees do not replace previous and existing discourses of water crisis and scarcity, but rather they build on and reinforce them. This paper finds that the impact these discourses had on the governance debates is that in Lebanon the resources mobilized focused on humanitarian interventions, while Jordan focused on development projects to strengthen the resilience of its water infrastructure and its overall water governance system.

Keywords: hydropolitics; Lebanon; Jordan; Syrian crisis; water scarcity; discourse analysis

1. Introduction

In the past decade, especially within environmental politics, there is a growing interest in, and concern for, the ways in which discourses are constructed, used and misinterpreted in public political debate about shared water resources [1,2]. There is also renewed interest in discourse theory and discourses’ employment in analyzing how they shape water governance debates [3–5], as previously done in the region [6–8]. This research brings these issues together, and applies them to an original and timely case-study focused on the impact of discourses of refugees on water governance debates in Lebanon and Jordan.

This paper focuses on the discourses and how the issue of refugees and water crisis are understood and represented by decision-makers, rather than considering the “real” impact of refugees on water resources. As discussed in the next section, a discourse is “a shared way of apprehending the world. [...] It enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts,” thus legitimizing knowledge and justifying specific policies [2]. As discourses are a key vehicle to shape people’s understandings and policies, it is necessary to understand how they are constructed and deployed, and the policy solutions they open (or close). This is the core of what discourse theory investigates [9].

Historically, discourses about water resources in Lebanon and Jordan have blamed their neighbors for not respecting international water law and for the unfair sharing of the Jordan River with its riparians [10]. However, since the Syrian crisis, new discourses on refugees are being created, informing and shaping the discursive governance debates around water scarcity [11]. New discourses, especially of Syrian refugees as exacerbating water scarcity, are emerging in Jordan [5,8] and Lebanon [12], shaping water governance debates nationally and regionally [3,13]. These two countries have been selected because they are the two Arab countries hosting most Syrian refugees, and because they are both suffering from a water crisis, as discussed in Section 3.

This study is guided by the following research question: How competing social narratives by and about refugees, water issues and water-policy choices have impacted the governance debates?

2. Materials and Methods

Concerning the methodology used for this research, given the guiding research question and the focus of this study on the new discourses, and on how they relate to the water governance debates, several methods of data collections were needed. In fact, the implementation of this research requires the deployment of different qualitative methods of data collection and different sources, as water is a very sensitive issue in Lebanon and Jordan. The methods of data collection used for this study are:

- (1) A desk-based review of Lebanese and Jordanian newspaper articles from January 2012 until January 2017—newspapers both in the Arabic and English languages have been analyzed, focusing on codes appearing in the titles of the articles referring to “water” and “refugees”—the newspapers selected for this research were the three most read newspapers in both countries; reports, press releases and declarations of the ministries of water and irrigations and of high-level governmental figures; policies and strategies on water released by the relevant ministries in Lebanon and Jordan in the period since the start of the Syrian War (e.g., 2015 Jordan National Water Strategy); academic articles and expert evidence produced by national universities and also internationally by international organizations and international meetings; reports by donors and aid agencies organizations based in Lebanon and Jordan;
- (2) Semi-structured interviews with key figures, including governmental personnel, diplomats, employees of donors’ organizations; local academics and refugees in camps and in host communities (to capture the refugees’ voices and perceptions);
- (3) Observation at public events of how issues of the water crisis and refugees issues are framed and discussed; in fact, one of the authors is Jordanian, one is Lebanese, and the other two are residents in Lebanon and in Jordan; they have been observing how everyday discourses, practices and conversations have been imagining, interpreting and transforming the narratives around water scarcity and refugees. Those data have been analyzed using critical discourse analysis (Fairclough) as a method of data analysis.

More specifically, method 1 was very useful to identify the new discourses, see how they are structured and framed, and by whom. Method 2 has been used to complement method 1 to understand how the new discourses relate to the water governance debates. To implement method 2, the authors have conducted semi-structured interviews to selected key informants working nationally on issues of water governance or involved in such debates, and therefore they are governmental personnel from the Ministry of Water and Irrigation in Jordan and from the Ministry of Water and Energy in Lebanon, academics from the top research centres working on water in the

two countries, including the American University of Beirut (AUB) in Lebanon and the University of Jordan in Jordan; and key donors and aid agencies based in Lebanon and Jordan. The selection of participants was based on the “purposeful sampling” method described by Patton [14] as one of the core distinguishing strategic themes of qualitative inquiry and means. He defined it as “Strategically selecting information-rich cases to study, cases that by their nature and substance will illuminate the inquiry question being investigated”. This entailed the identification and selection of individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest [15]. In order to capture the maximum variation that allows the identification of important common patterns that cut across these variations [16], “heterogeneity sampling” was used in selecting key informants from different categories representing the sectors involved in the field of inquiry; academia, government, international agencies and research institutes. In addition to this, snowball sampling techniques were also employed. The length of the interview on average was between 45 and 60 min. An interview guide was designed following guidelines on qualitative interviewing by Patton [14]. The interview guide was prepared to ensure that the same basic lines of inquiry are pursued with each person interviewed. The interviews remained fairly conversational and situational, and allowed us to build a conversation and to word our questions spontaneously. Based on the main research question a list of sub questions was developed and aimed at exploring different angles of the topic.

As summarized in Table 1, the questions that have been asked during the semi-structured interviews included: how did the Syrian War impact water demand and supply in the country? How did the government and water ministry face the implications of the Syrian crisis? What are the impacts of the Syrian refugees on water resources in the country? What new policies and strategies are needed, or what needs to be changed, in order to account for the increased population following the wave of Syrian refugees? What are the fundamental reasons and causes behind the water crisis in the country? Those were only starting questions to begin the conversation during the interviews, as we decided to conduct semi-structured interviews, allowing for follow up questions according to the answers received and on how the conversation unfolded.

Table 1. Starting questions for the semi-structured interviews.

Starting questions for the semi-structured interviews
How did the Syrian War impact water demand and supply in the country?
How did the government and water ministry face the implications of the Syrian crisis?
What are the impacts of the Syrian refugees on water resources in the country?
What new policies and strategies are needed?
What needs to be changed, in order to account for the increased population following the wave of Syrian refugees?
What are the fundamental reasons and causes behind the water crisis in the country?

3. Theoretical Framework for A Discursive Comparative Study Research

This study is informed by the theory and method of discourse analysis. Dryzek [17] emphasizes that environmental issues can be framed in different ways, each constituting a discourse, and each opening a different set of solutions and policy options [17]. However, discourses in the policy agenda-setting stage may or may not result in actual policy choices and governance outcomes; nevertheless, they play an important role in opening up the policy options available. Dominant discourses—which are the discourses that reach more people outside of those creating them, and therefore the ones that have more space in public and mainstream channels—are powerful and can shape policies, driving towards and opening specific solutions [18]. “The implicit purpose of these competing ideologies [discourses] is not just to convince but to control; better stated, they aim to control by convincing” [19]. In fact, as shown by Feitelson [20], Mehta [21] and Edwards [22], discourses can be constructed and deployed to shape people’s understanding of water issues opening policy-solutions and driving towards which policies should be adopted [20–22].

A discourse is “a shared way of apprehending the world. [...] It enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts,” thus legitimizing knowledge and justifying specific policies [2]. Being that discourses are the key vehicle to shape people’s understandings and policies, it is very important to investigate how they are constructed, deployed, and the policy solutions they open (or close). This is the core of what discourse theory investigates [10].

To conduct the analysis for this study, we have used two theoretical lenses, the first of which is Fairclough’s Framework of Critical Discourse Analysis (CDA), which is used in order to identify and analyze the discourses [10]. We then benefited from the theories of Comparative Approach to conduct the comparison between the Lebanon and Jordan cases. As required by the Comparative Approach theories, in Section 3.1. we provide background information on Lebanon and Jordan, useful to operationalize the intended comparison in Section 4.

Fairclough’s framework is central to operationalize the study of discourses and the relation between texts, discursive practice and social practice. Fairclough’s three-dimensional framework shows that social practice is based on and constrains discursive practice, which is based upon texts. According to Fairclough [10], the first dimension is represented by the text, which is the spoken or written text itself like a report or declaration; the second dimension is the discursive practice, which is the production and interpretation of such text; and the third dimension is the social practice, which is the context (social, political and economic) in which also the first two dimensions are situated, as well as the implications of the discursive practice on the social world [10].

The Comparative Approach theories draw from Pennings et al. [23]. In their handbook titled “Doing research in political science: An introduction to comparative methods and statistics” they elaborate on how to conduct comparative research, emphasizing the necessity of building a strong research design and methodology for successful comparative studies [23]. In line with their book and with the research question of this paper, this study adopts two cases—Lebanon and Jordan—at two-time intervals—2010 (pre-Syrian crisis) and 2012–2017 (period of the Syrian crisis), meaning we adopt a closed universe of the discourse comparative approach type. This approach of the ‘few’ cases alternative does usually take into account time such as be it before/after an event—like war or economic crisis—like for the case of this study in relation to the Syrian War. As underlined by Ragin [24] in the theoretical literature of Comparative Approach research, “few(er) Cases Research Design is seen as a ‘focused comparison’ which is directly derived from the Research Question under review”. As pointed out by Pennings et al. [23], the choice of the cases is very important, especially because they need to be relevant, with features of the core subjects directly linked in the different cases selected, more or less a ‘closed shop’. In order to conduct successful comparative research studies, we also need to identify, for the purpose of this paper and in line with Pennings et al. [23], a set of indicators for operationalizing the comparative aspect of this study. To this extent, we will focus on the following aspects:

- (1) What are the water resources and the institutional framework in Lebanon and Jordan?
- (2) What discourses were dominant in the water governance debates in Lebanon and Jordan concerning water crisis before the Syrian War?
- (3) What discourses are dominant in the water governance debates in Lebanon and Jordan concerning water crisis after the Syrian War?

4. Technical Background Information on the Two Cases

Concerning the first aspect of our analysis, which according to our theoretical comparative framework focuses on identifying the water resources and the institutional framework in Lebanon and Jordan, this section aims at shading some light and in providing the background information to understand the situation in the two countries and the cases considered.

Lebanon is relatively rich with water resources compared to the Arab region’s countries, although technically below the 1000 million cubic meter (MCM) per capita per year threshold of water scarcity. In 2012, the World Bank estimated 1200 MCM/capita per year for Lebanon [25]; then the ministry of energy and water (MOEW) showed that the water per capita has decreased to 839

MCM/capita per year in 2015—when considering the renewable water resources. According to the estimates of Food and Agriculture Organization of the United Nations (2017) for available renewable water for Lebanon, in 2017 it was of 789 m³ per capita per year [26]. The yearly rainfall average in Lebanon varies between 800 and 1000 mm [27]. Lebanon has 40 rivers, which constitute the surface water resources, estimated at 2.2 billion cubic meter (BCM). The longest river is the Litani, with an average flow of about 750 MCM and about 170 km long. The Ibrahim River is another important river. Rivers of transboundary nature include: The Orontes river—it flows from Lebanon to Syria and then to Turkey; the Hasbani river; and the el Kebir River, shared with Syria. Minor rivers can also be found on the Mediterranean coastal area. Pollution by municipal waste and wastewater is a major bottleneck for securing national water needs from these surface water resources. In general, water demands by sector can be summarized as 61% of the water supply goes to agriculture, 30% for municipal use and 9% for industry [28]. Nevertheless, Lebanon secures its water needs from its groundwater resources—estimated at 0.5 BCM by MOEW. The two main aquifer systems in Lebanon are the Keserwan Limestone Formation and the Sannine – Maameltein Limestone Formation. Aquifers in Lebanon are now over-exploited beyond their safe yield, causing not only a decrease in quantity, but also of salinity increase—and therefore of decreased quality—especially of the coastal aquifers. In addition, non-conventional water resources are not widespread in Lebanon. For instance, minor availability of wastewater treatment, while desalination is also still limited, and currently conducted mainly by the private sector.

Lebanese water resources are managed by the following actors: The Ministry of Energy and Water (MOEW) and the respective departments the of the Directorate of Hydraulic and Electrical Resources, and the Directorate of Exploitation. The latter is responsible for the regional water establishments, which oversee water supply, wastewater management and irrigation all over the country. The Litani River Authority (LRA) has extended authority, as it manages water supply at the largest river. Other governmental institutions house units that are responsible for water governance. It is also worth mentioning that the Ministry of Agriculture houses a unit responsible for the water tariffing system; the Ministry of Public Health has a unit responsible for the water quality standards in the potable water on the market; another unit at the Ministry of the Environment looks after environmental standards and pollution. The municipalities, a part of the Ministry of the Interior, are responsible for urban wastewater networks. Finally, yet importantly, the Council for Development and Reconstruction, the Council of the South and the Central Fund for the Displaced, are broadly speaking responsible for reconstruction, and therefore they may be involved in the restoration of water management infrastructures. Eid-Sabbagh [6] has explained that more actors are involved in the legislative process, including the parliament, council of ministers, the prime minister's office, the high council for privatization, the relevant parliamentary sub-committees, the ministry of finance, of foreign affairs, and the public recruitment council, should also be seen as relevant actors of the water management sector in Lebanon [29].

When it comes to the water resources in Jordan, according to the Ministry of Water and Irrigation, most of the Jordanian territory receives less than 50 mm per year in rainfalls, making Jordan a country with arid climatic conditions and limited water resources. According to the estimates of FAO [30] for available renewable water for Jordan, it was 70 m³ per capita per year. Jordan has 15 major surface water catchment areas, 12 major groundwater basins, and three rivers—the Zarqa, the Yarmouk and the Jordan—of which only the first one is not of transboundary nature. More than 50% of water usages in Jordan are mainly pumped from the groundwater, and most water supply goes to agriculture (although there has been a swift increase in the domestic water sector demand). However, groundwater is the main resource for domestic fresh water in Jordan. Nevertheless, what is ultimately starting to attract more attention is that groundwater resources are over-pumped beyond their safe yield, negatively impacting the quantity and quality of the renewable groundwaters. So overall, the situation in Jordan is that the surface water resources have low water quality, and the Yarmouk and the Jordan rivers are shared with neighboring countries, binding the Jordanian usage to the existing bilateral agreements, while the groundwater resources are being over pumped, and their water quality and quantity is degrading.

Concerning the institutions involved in the Jordanian water sector, there are several players—both national and international, public and private sectors. Nevertheless, the official institutions in the country are: The Ministry of Water and Irrigation (MWI), the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA). The MWI was established in 1988 and is the main public water institution in Jordan. Its main responsibilities are at the policymaking level. The MWI responsibilities include outlining the country's water strategy, creating the national master plan for water use, preparing water studies, as well as monitoring water resources. The WAJ, which operates under the MWI, is responsible for the operational management of water resources and the organization of water supply and wastewater treatment in the country. Therefore, this means that the WAJ is responsible for managing groundwater resources by controlling groundwater pumping licences and permits. The WAJ is not responsible for the Jordan Valley area (and therefore is mainly responsible for the Highlands). The JVA operates under the MWI and is responsible for the development of the Jordan Valley area, including the protection of all water resources in the valley (where the Jordan River flows).

5. Results

5.1. Lebanon: From Focusing on Israel to Emphasizing Refugees

This section aims at capturing the discourse in Lebanon generated by the influx of refugees in relation to the water sector by applying Fairclough's Critical Discourse Analysis (CDA) Framework. Lebanon has been suffering from severe water crisis. This water crisis, as recently shown by several scholars, can be traced to many reasons including climate change, government mismanagement of water resources, and conflict with Israel. Moreover, Lebanon is hosting 947,063 registered Syrian refugees [31], and about 500,000 unregistered Syrian refugees [32]. It hosts the highest number of refugees per capita worldwide (according to United Nations High Commissioner for Refugees (UNHCR)) 173 refugees per 1000 inhabitant); more than one-fourth of the population living in Lebanon is Syrian [32]. As for the Beqaa region, the population of Lebanese and Syrians is now roughly the same. Most displaced Syrians—about 341,408—live with Lebanese host communities, mostly in Baalbeck and the Upper Litani River Basin [31].

Concerning the second aspect of our analysis, which according to our theoretical comparative framework, focuses on identifying what discourses are dominant in the water governance debates in Lebanon concerning the water crisis after the Syrian War; we found that the mainstream dominant discourse we have registered in interviews with academics from institutions based in Lebanon and in the public declarations of governmental officials, shows a narrative that focuses on population growth, especially due to the sudden influx of refugees. This is what Fairclough would call the discursive practice, as this is the discourse present in public declarations, and in private conversations and interviews [10]. The textual dimension of this discourse appears in donors' reports, governmental press releases and academic articles on the topic. According to this discourse, the population growth resulted in an increased water demand, which reduced the availability of adequate water to the local residents of Lebanon. As mentioned by Lebanese scholars in "the Guardian", "Lebanon, which has many rivers and water sources, is water-rich compared to Jordan, Israel or much of Syria. But the amount of renewable water available in the country has dropped from more than 1000 cubic metres a year per person—considered the threshold of water poverty—to around 700 m³ per person since the refugees arrived" [33]. In our interviews, it emerged that the current belief is that although many of the refugee communities in Lebanon have minimal access to water, the cumulative effect created by their large number has led to overexploiting the country's water resources. Interviewees argued that as an illustration, in informal tented settlements the demand on water resources was increased due to larger reliance on trucked water obtained from unregulated and illegal pumping from surface and subsurface sources and illegal network tapping. This intensified demand for water has increased competition over available water resources in the Beqaa in particular, and the Lebanon in general.

The negative impact of refugees on the water sector is seen, in this narrative, as having two components: on quantity and another on the quality of water resources. In fact, the Lebanon Environmental Assessment of the Syrian Conflict and Priority interventions (EASC) divides the impacts of refugees on water resources into two main items categories: quality and quantity. Regarding water resources, the biggest impact studied and emphasized by the Lebanese Ministry of Water and Energy is the depletion of water resources. According to the EASC, the refugees' main sources of water are the public water network, wells and public reservoirs, which would increase the stresses on water resources in general and on groundwater in particular. Studies included in the EASC have also confirmed the depletion of water from both surface and groundwater sources. For instance, according to the Litani River Authority (LRA), the basin of the river has witnessed, and is still witnessing, a decrease in the water volume since the start of the Syrian Conflict. Moreover, the large demand on water supply has led to notable pressures on coastal aquifers in Lebanon. The second impact concerns water quality deterioration [20]. According to several studies by the EASC, the bacteriological quality of water in some areas showed ten times higher levels of contamination than the World Health Organization (WHO) guidelines [34]. According to a study "Assessing the Contribution of Demographic Growth, Climate Change and the Refugee Crisis on Seawater Intrusion in the Tripoli Aquifer", seawater intrusion will be noticed as it would move forward inland, leading to salinization of the aquifer. This is said to be mainly due to climate change and the high demand of water caused by the influx of the Syrian refugees [35].

Concerning the third aspect of our analysis which focuses on identifying which discourses were dominant in the water governance debates in Lebanon concerning water crisis before the Syrian War, our interviews indicated that the Lebanese governments' discourse often addressed the topic of the water crisis as a national security issue, specifically emphasizing that the issue of water scarcity in the country was linked to transboundary water governance, especially with the State of Israel. This was mainly done with the help of two discourses. The first one was the water diversion theory which was broadly presented in the news, governmental publications and speeches for many years. As shown by Amery, this theory claims that Israel dug a tunnel linking the Litani River to its borders during 1982–1984 [36]. Although this argument was later retracted by the Lebanese government, it was accepted by the people for many years, and the government has used it to distract the public and justify most issues concerning water [37]. The second discourse concerns the damages regarding the infrastructure of the water sector inflicted by Israel during the several Israeli–Lebanese wars. This narrative was used repeatedly by the Lebanese government to redirect public attention from government mismanagement and inefficient policies to external factors [22].

The current discourses often emphasize the link between the influx of the Syrian refugees and the dysfunctional water sector. There has been an abundance of stories in television, newspapers, political parties' speeches and conferences during the last eight years in Lebanon [36]. For instance, in an interview with "the Guardian", the general director of hydraulics and electrical resources at the Ministry of Energy and Water of Lebanon stated: "because of the Syrians, a water balance that should have been negative in 2030 is negative now,". "We were organized to fulfil water demand management for about 4.5 million (people). We were not ready to deal with the one-and-a-half to two million extras that have come already" [37]. Although the influx of Syrian refugees is a main constituent of the failure of the water sector, it has shed light on the real factors underlying water security and scarcity issues and changed governmental discourses. These factors include: The overexploitation of groundwater due to the high demand, the severe depletion of the water table across the country, salt water intrusion in coastal areas, and the deterioration of the quality of the available water [38]. From this, it emerges that the discourse of refugees has altered the Lebanese government narratives about the malfunctions and failures of the water sector from a regional blame-model to a domestic blame-model, shaping in this way the debates on water governance in the country [39].

These shift in the state water narrative perceivable the government response to the refugee influx, which is expressed in the "Lebanon Crisis Response Plan (LCRP)" developed with its international and national partners. In the water sector section, the LCRP notes that "In the wake of

the crisis, the focus necessarily switched from resource management to emergency relief to address the needs of an extra 1.5 million displaced Syrians dispersed in hosting communities” [31]. The plan’s core strategies and operations concerned the water sector crisis in many aspects, informing in this way the water governance agenda, options and debates in the country. In addition, UNHCR has worked with the Water Establishment and municipalities to ensure continuous access to safe water at a household level and basic sanitation facilities [40–43].

Concluding this part, it appears that the water discourse in Lebanon is essentially politically driven, and can evolve with changing conditions such as election and internal political considerations.

The narrative of Lebanese politicians regarding the Syrian refugees changed drastically in 2016, and in the lead-up to the 2018 parliamentary elections, fueling rising tensions and framing refugees as the cause of unemployment and instability [44]. For instance, according to the Daily Star, a Lebanese MP blamed the Syrian refugees in the Beqaa Valley for the increased pollution of the Litani River. During a news conference, he affirmed that wastewater from the Syrian refugee camps was one of the main causes leading to the river’s pollution stating that “this pollution has increased with the presence of the Syrian refugee camps in huge numbers on the banks of the river in West Beqaa,” [45]. This narrative especially intensified after the parliamentary elections, as many politicians including the speaker of the Lebanese parliament repeatedly demanded the return of the Syrian refugees to Syria. They appealed for Arab help to facilitate the return of refugees and to pressure the Syrian government into taking them [46]. The UNHCR reports that after the parliamentary elections, host communities’ demand to force refugees’ return to Syria was amplified, shaping the governance debates and narratives in the country. Currently, many Lebanese municipalities, with the help of local police, tightened their restrictions on Syrian refugees [47].

5.2. Jordan: A Multifaceted Refugees’ Narrative

The second case study considers the Hashemite Kingdom of Jordan because it is said to be the second most water scarce country in the world; and because since the start of the conflict in Syria in 2011, Jordan has opened its borders to waves of Syrian refugees. In fact, it is currently hosting 655,000 refugees registered with UNHCR [48], although the Jordanian government estimates that the number of Syrian refugees is higher, and usually refers to 1.4 million Syrians in the country, which also includes the number of Syrians that were living in the country prior to the crisis and those not registered with UNHCR.

Concerning the second aspect of our analysis, which according to our theoretical comparative framework focuses on identifying what discourses are dominant in the water governance debates concerning the water crisis after the Syrian conflict, we found that the Jordanian government’s general discourse on refugees underlines that catering for their needs and ensuring their access to key public services, including health, education, municipal services and water, has impacted heavily on Jordan’s finances and ability to deliver quality services for all [49]. The Jordanian government has also calculated that the direct cost of the Syria crisis on Jordan is around USD 10.2 billion since 2011 [49]. While there are different views on the extent of the impact of the Syrian refugees on water resources, interviews showed that governmental discourses emphasize that, especially since the Syrian refugees crisis, groundwater depletion is accelerating due to over-pumping beyond the aquifers’ safe yield, and the water tables are dropping precipitously. For the interviewees, as water levels decline, salinity rises, negatively impacting the quality of the shrinking groundwater resources.

In the Jordanian discourses, the Syrian crisis is seen as an additional pressure to the scarce water resources of Jordan, and refugee demands layer over long-standing challenges of scant supply, unsustainable management, and out-of-date infrastructure. Over the past years, large-scale investments—deeper wells, bigger pipelines, dams’ construction—have bought Jordan time [50].

Yet, by reading the Jordanian newspapers and listening to Jordanian policy makers, the impact of the Syrian crisis seems to have sped up the clock [51]. As a result, by analyzing governmental declarations in national newspapers and strategies since 2011, we have identified one governmental narrative about refugees in relation to water resources, and one main implication on the water governance debate. This is the discursive practice of Fairclough’s Critical Discourse Analysis

Framework, and it originates from the textual dimension which in this case is represented by press releases of the MWI, academic articles on the topic, and in particular governmental reports and documents, such as the updated version of the National Water Strategy published in 2015, and donors' reports on the topic [4,5].

The first discourse underlines that the Syrian refugees have increased the water demand in the country, therefore contributing to and exacerbating water scarcity in Jordan. In fact, in October 2014 the then Minister of Water and Irrigation (MWI) Hazem Nasser said that Jordan had borne the burden of hundreds of thousands of Syrian refugees, stressing in a statement e-mailed to The Jordan Times that the influx of refugees caused water demand to increase by 40 per cent in the north, 10 per cent in Karak in the south and by more than 20 per cent of the Kingdom's average water demand [52]. In a similar statement earlier in the year, the Minister had also clearly identified how such impact had negatively affected the national projects and strategies. "We are operating the Disi Water Conveyance Project at 92 per cent of its capacity, which is a figure we planned to reach in three to four years," he noted. The Disi canal project connects the Disi Aquifer, which is shared between Jordan and Saudi Arabia, to the Greater Amman region. Through this canal, water is being pumped for a distance of around 325 km, and it has been operating since July 2013, aiming at providing drinking water to the capital, where most of the water demand is concentrated. He underscored that hosting thousands of Syrian refugees "ruined" the ministry's strategies and plans, which were replaced by "emergency plans" formulated every summer [53]. In fact, he underlined that the plans of how to use the Disi water changed, from serving the demands of the capital to also serving the Zaatari refugee camp and to the northern districts, where refugees are mainly concentrated. This means that the Disi water is being over-exploited, and will last for a shorter period than the one initially planned for.

While some light variations can be noted in such discourse over the past years, depending on the political circumstances, the overall message of this narrative has remained the same over the years. This can be noticed even recently from the statement by the former Minister of Water and Irrigation, Ali Ghezawi: "The Syrian exodus has fatigued us. Despite all efforts to explore new water resources, the gap between supply and demand remains substantial" [54]. The emphasis of this discourse is often placed on the refugees' influx as an external factor that increases the demand of water, but that also negatively affects the supply. In fact, the Jordan Response Plan 2018–2020 notes for instance that "non-revenue water is as high as 50%–70% in the hard-affected governorates by the crisis, mainly due to the poor condition of the networks as a result of extreme pumping pressure arising out of the increased demand on water. Water and sanitation vulnerabilities have increased because of the refugee crisis, [...] the water demand increased by 40% in Northern governorates [...], and the frequency of the water supply in some locations reduced from once a week to once every four weeks, resulting in a daily per capita share 50% less than the standard" [49].

The second element of the first discourse is that Syrian refugees are wasting the Jordanian water resources because of their different lifestyle when it comes to water use. Interviews showed that whereas Jordanians have rationed water since the 1980s, refugees from comparatively water-rich Syria lack the basic habits of water saving and conservation. Jordanian families wash clothes and do dishes, quickly shower, and store enough to get through the week. Refugees arriving in Jordan do not always quickly adjust, and many lack basic habits of conservation [50]. For this reason, several development agencies (e.g., the United Nations International Children's Emergency Fund (UNICEF), Gesellschaft für Internationale Zusammenarbeit (GIZ)) have launched awareness campaigns and projects to enhance water conservation strategies, in collaboration with the MWI.

Concerning the reflections of this discourse in the water governance debate, the use of the refugee narrative appears to be a leverage to call for support from the international community: in 2014 the Jordanian government in partnership with the United Nations (UN) and the broader donor and NGO community developed the first response plan. The National Resilience Plan, and especially the following Jordan Response Plans, were short to medium-term strategies to address the impact of the Syria crisis both from humanitarian and resilience perspectives. On average, every year from 2014 to 2018 the Jordanian government requested around \$ 240 million for a total of about \$ 1.2 billion for

the water sector alone (Data was extracted from the individual Water, Sanitation and Hygiene Program (WASH) sectoral financial needs of the National Response Plan (2014–2016), replaced and followed by the Jordan Response Plans (2015; 2016–2018; 2017–2019; 2018–2020). The plans can be found on the website of the Jordan Response Platform for the Syria Crisis). Government officials continuously exerted pressure on donors—by using the refugees’ discourse—to bridge the funding gap, noting that otherwise refugees’ and local communities’ needs would not be met, thereby risking worsening humanitarian and living conditions. At the National Conference on Water and Sanitation organized by the MWI and UNICEF in 2015 for instance, the then Minister Nasser stressed that “if the required funds (\$750 million for 2015–2017) are not secured, there will be a negative impact on Syrian refugees’ health, security and environment” [55]. Such discourse was reinforced in 2018 by Minister Ghezawi, who expressed on several occasions his dismay over the international community’s “low level of response, below the needed level” to Jordan’s challenging water situation [54]. The refugees discourse also further emerged in the updated version of the National Water Strategy of Jordan in 2015, informing and shaping the water governance debates in the country [55–57]. Moreover, another important recent implication on the water governance debate has been the switch of priorities to ensure water security in the country: from the Disi project (now completed) and a regional Red Sea—Dead Sea project with Israel and Palestine, to a desalination plant in Aqaba and a Jordan National Water Carrier (without a regional dimension, also due to the latest political relations between Israel and Jordan, which have deteriorated in the past two years). While in the past donors were attracted by the regional dimension of the project and they would have not considered a Jordan-only project, Jordan is now emphasizing that this project is needed to meet the water demand of all refugees and Jordanian citizens in the country. As such, desalinizing water would benefit the refugees as well, making the project more appealing to the donor community.

Concerning the third aspect of our analysis, which according to our theoretical comparative framework focuses on identifying what discourses were dominant in the water governance debates concerning the water crisis before the Syrian conflict, we found in the interviews to academics and governmental personnel that they had as their main textual dimension the previous National Water Strategy of 2008 “Water for Life”, and as main discursive dimensions: population growth due to refugees from Palestine, Lebanon and Iraq; low precipitation; transboundary nature of water resources and treaties not always respected. Moreover, donor reports and interviews to academics and donors showed also a discourse emphasizing water mismanagement, with particular focus on non-revenue water, leakages, water theft and an inefficient agricultural sector [4,5].

6. Discussion: Comparative Analysis

As summarized in Table 2, the findings that stemmed out from the above analysis portray a very similar picture of the new refugee discourses in the water governance sectors of Lebanon and Jordan, although some differences exist. The analysis is informed by the theoretical framework and analysis done in the previous section, which deployed critical discourse analysis to identify and distill the different discourses concerning Syrian refugees and the water crisis in Lebanon and Jordan, and how these discourses relate to the water governance debates in the two countries. Such country comparison can be undertaken from the following main perspectives, which are also summarized in the table below.

First, both Lebanon and Jordan are similar in how they have both been facing a water crisis, according to the governmental declarations, reports and newspapers reporting. Moreover, they are the two Arab countries hosting most Syrian refugees. Discursively, Lebanese and Jordanian governments’ discourses attempted to emphasize the link between water scarcity and the influx of Syrian refugees.

Second, in Lebanon the discourses mainly revolve around the pressure that the wave of refugees placed upon existing resources and infrastructure, further affecting water quality and quantity. There is, however, a recognition that a critical issue for Lebanon is also the inefficient and poorly maintained systems and networks and management of its water resources sector [44]. The discourses in Jordan seem instead more multifaceted. While also in this case the predominant point is on the increased

water demand and the pressure on strained systems, discourse around the nonefficient and sustainable water use by Syrian refugees also emerged.

Third, both Lebanon and Jordan developed discourses on the effect of refugees' influx on water-related issues to exercise pressure on the international community in a quest for additional financial support. In both cases, the national response plans to the Syria crisis, the LCRP and the JRP respectively, constituted the main resource mobilization tools by the governments. In Lebanon, the resources mobilized under the LCRP were mainly directed towards UN agencies or implementing partners with an almost exclusively humanitarian angle. In the case of Jordan instead, according to interviews to donor organizations based in Amman and to employees of the MWI, the government has been looking to mobilize funding to also strengthen the resilience of its water infrastructure and its overall water governance system.

Fourth, in both countries the new discourses of refugees do not replace previous and existing discourses of water crisis and scarcity, but rather they build on them or co-exist with them, opening new policies solutions, policy agenda-options and ideas for the water governance debates and arenas.

Table 2. Similarities and differences Lebanon and Jordan.

Similarities	Differences
Both Lebanon and Jordan are seen as facing a water crisis	Discourses in Lebanon: focus on the pressure that the refugees placed on existing resources and infrastructure. Recognition of the inefficient and poorly maintained water systems and networks and management. Discourses in Jordan: increased water demand and pressure on strained systems, discourse around the nonefficient and sustainable water use by Syrian refugees also emerged.
Lebanon and Jordan are the countries hosting the most Syrian refugees in the Arab World.	
Both governments' discourses emphasize the link between water scarcity and the influx of Syrian refugees	
Impact on water governance: in Lebanon the resources mobilized focused on humanitarian interventions, while Jordan focused on development projects to strengthen the resilience of its water infrastructure and its overall water governance system.	
In both countries the new discourses of refugees build on and reinforce the pre-existing discourses of water scarcity.	

7. Conclusions

This research analyzed the impact of the discourses of refugees on water governance debates in Lebanon and Jordan. This paper showed that since the onset of the Syrian crisis, new discourses emphasizing how Syrian refugees exacerbated water scarcity have been developed and have gained prominence in governmental declarations and national mass media.

These discourses have informed the water governance debates in the two countries. At the same time, it helped the two governments to seek for international support and donors' aid in order to face the "water crisis" due to the refugees' arrivals. Nevertheless, this study only focused on the impact of Syrian refugees from a discursive perspective, and their relation to the water governance debates

and discourses. Therefore, future research should analyze the impact of refugees on water resources in the two countries, and on water governance outcomes, and compare the findings with the discourses emerged from this article, thereby allowing a discourse-reality check. Another limitation of this study is that it focused on the new discourses concerning refugees and the impacts of the Syrian war; however, new discourses of climate change are also discussed in water governance debates, and therefore a limitation of this study is its focus on the former rather than on the latter. Also, given the findings and results of this study, future research could investigate the implications of the climate change discourses on water governance debates, as well as the pros and cons of shaping governance debates towards mobilizing funding for humanitarian versus development interventions in areas.

Author Contributions: All authors contributed, to different extent, to the design, data collection, analysis, and drafting of this paper. All authors have read and agreed to the published version of the manuscript.

Funding: This publication was also made possible in part through the support received by the first author from the Arab Council of the Social Sciences (ACSS) with Funding from the Carnegie Corporation of New York for the postdoctoral fellowship program (Cycle 4). The first author is also grateful to the Council for British Research in the Levant (CBRL) for the research grant received. The views expressed are solely the responsibility of the authors.

Acknowledgments: The authors are grateful to Anders Jägerskog for his supervision and feedback on earlier versions of this paper. This paper was made possible by an initiative in 2019 of the Center for Mediterranean Integration (CMI) in support of its Mediterranean Youth for Water Network (MedYWat), which facilitated supervision and collaborative works of young water professionals in the Mediterranean region.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer: The views expressed by the authors are their own and do not represent the views of the institutions they are affiliated with.

References

1. Hartmann, B. Rethinking climate refugees and climate conflict: Rhetoric, reality and the politics of policy discourse. *J. Int. Dev.* **2010**, *22*, 233–246.
2. Dryzek, J.S. *The Politics of the Earth: Environmental Discourses*; Oxford University Press: Oxônia, UK, 2013.
3. Hissen, N.; Conway, D.; Goulden, M.C. Evolving Discourses on Water Resource Management and Climate Change in the Equatorial Nile Basin. *J. Environ. Dev.* **2017**, *26*, 186–213.
4. Hussein, H. Yarmouk, Jordan, and Disi basins: Examining the impact of the discourse of water scarcity in Jordan on transboundary water governance. *Mediterr. Politi.* **2018**, *24*, 269–289.
5. Hussein, H. Lifting the veil: Unpacking the discourse of water scarcity in Jordan. *Environ. Sci. Policy* **2018**, *89*, 385–392.
6. Eid-Sabbagh, K. P. (2015). A political economy of water in Lebanon: water resource management, infrastructure production, and the International Development Complex (Doctoral dissertation, SOAS, University of London).
7. Weinthal, E., Zawahri, N., & Sowers, J. (2015). Securitizing water, climate, and migration in Israel, Jordan, and Syria. *International Environmental Agreements: Politics, Law and Economics*, *15*(3), 293–307.
8. Hommes, L., Boelens, R., & Maat, H. (2016). Contested hydrosocial territories and disputed water governance: Struggles and competing claims over the Ilisu Dam development in southeastern Turkey. *Geoforum*, *71*, 9–20.
9. Zeitoun, M.; Eid-Sabbagh, K.; Talhami, M. The Influence of Narratives on Negotiations and Resolution of the Upper Jordan River Conflict. *Int. Negot.* **2013**, *18*, 293–322.
10. Fairclough, N. *Critical Discourse Analysis: The Critical Study of Language*; Routledge: London, UK, 2013.
11. Müller, M.F.; Yoon, J.; Gorelick, S.M.; Avisse, N.; Tilmant, A. Impact of the Syrian refugee crisis on land use and transboundary freshwater resources. *Proc. Natl. Acad. Sci. USA* **2016**, *113*, 14932–14937.
12. El-Fadel, M.; Ghanimeh, S.; Maroun, R.; Alameddine, I. Climate change and temperature rise: Implications on food- and water-borne diseases. *Sci. Total. Environ.* **2012**, *437*, 15–21.
13. Earle, A.; Cascao, A.E.; Hansson, S.; Jägerskog, A.; Swain, A.; Öjendal, J. *Transboundary Water Management and the Climate Change Debate*; Informa UK Limited: London, UK, 2015;.

14. Patton, M.Q. *Qualitative Research & Evaluation Methods Integrating Theory and Practice*, 4th ed.; SAGE Publications, Inc.: Thousand Oaks, CA, USA, 2014.
15. Creswell, J.W.; Clark, V.L.P. *Designing and Conducting Mixed Methods Research*; SAGE Publications, Inc.: Thousand Oaks, CA, USA, 2011.
16. Palinkas, L.A.; Horwitz, S.M.; Green, C.A.; Wisdom, J.P.; Duan, N.; Hoagwood, K. Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Adm. Policy Ment. Heal. Ment. Heal. Serv. Res.* **2015**, *42*, 533–544.
17. Dryzek, J.S. The Politics of the Earth: Environmental Discourses. *Hum. Ecol. Rev.* **1998**, *5*, 65.
18. Hajer, M.A. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*; Oxford University Press: Oxônia, UK, 1995.
19. Scott, J.C. *Weapons of the Weak: Everyday Forms of Peasant Resistance*; Yale University Press: New Haven, CT, USA, 2008.
20. Feitelson, E. Implications of shifts in the Israeli water discourse for Israeli-Palestinian water negotiations. *Politi. Geogr.* **2002**, *21*, 293–318.
21. Mehta, L. *The Politics and Poetics of Water: The Naturalisation of Scarcity in Western India*; Orient Blackswan: Hyderabad/Telangana, India, 2005.
22. Edwards, G.A.S. Shifting Constructions of Scarcity and the Neoliberalization of Australian Water Governance. *Environ. Plan. A Econ. Space* **2013**, *45*, 1873–1890.
23. Pennings, P.; Keman, H.; Kleinnijenhuis, J. *The Comparative Approach: Theory and Method. Meaning and Use of the Comparative Method: Research Design*; SAGE Publications, Inc.: Thousand Oaks, CA, USA, 1999.
24. Ragin, C. C. (1994). Introduction to qualitative comparative analysis. The comparative political economy of the welfare state, 299, 300–9.
25. World Bank Group. *Country Water Sector Assistance Strategy (2012–2016)*; World Bank Group: Washington D.C., USA, 2012.
26. Food and agriculture organization (FAO). *Aquastat, Country profile: Lebanon*; FAO: Rome, Italy, 2017.
27. Eid-Sabbagh, K.P. A Political Economy of Water in Lebanon: Water Resource Management, Infrastructure Production, and the International Development Complex. Ph.D. Thesis, University of London, London, UK, 2015.
28. United Nations Development Program (UNDP). National Guideline for Rainwater Harvesting Systems. 2016. Available online: <https://www.undp.org/content/dam/lebanon/docs/Energy%20and%20Environment/Publications/RWHG.pdf> (accessed on 11 January 2019).
29. Ministry of Energy and Water (MOEW). 2015. Available online: <http://www.energyandwater.gov.lb/ar/details/100028/> (accessed on 11 January 2019).
30. Food and Agriculture Organization (FAO). *Aquastat Country Profile: Jordan*; FAO: Rome, Italy, 2017.
31. Lebanese Crisis Response Plan (LCRP). 2017–2020. Available online: https://reliefweb.int/sites/reliefweb.int/files/resources/2017_2020_LCRP_ENG-1.pdf (accessed on 11 January 2019).
32. United Nations High Commissioner for Refugees (UNHCR), Syria Regional Refugee Response. 2019. Available online: <https://data2.unhcr.org/en/situations/syria/location/71> (accessed on 14 January 2019).
33. Vidal, J. Water Supplies in Syria Deteriorating Fast Due to Conflict, Experts Warn. The Guardian. 2016. Available online: <https://www.theguardian.com/environment/2016/sep/07/water-supplies-in-syria-deteriorating-fast-due-to-conflict-experts-warn> (accessed on 11 January 2019).
34. Lebanese Ministry of Environment (MOE). Environmental assessment of the Syrian conflict EASC & priority interventions. 2014. Available online: <http://www.undp.org/content/dam/lebanon/docs/Energy%20and%20Environment/Publications/EASC-WEB.pdf> (accessed on 11 January 2019).
35. Kalaoun, O.; Jazar, M.; Al Bitar, A. Assessing the Contribution of Demographic Growth, Climate Change, and the Refugee Crisis on Seawater Intrusion in the Tripoli Aquifer. *Water* **2018**, *10*, 973.
36. Amery, H. A Popular Theory of Water Diversion from Lebanon: Toward Public Participation for Peace. In *Water in the Middle East: A Geography of Peace*; University of Texas Press: Austin, TX, USA, 2010.
37. Walnycki, A. Five Fundamentals to Keep Lebanon's Water Flowing. In *International Institute for Environment and Development*; 2017. Available online: <https://www.ied.org/five-fundamentals-keep-lebanon-water-flowing> (accessed on 11 March 2019).
38. The guardian 2015. Available online: <https://www.theguardian.com/global-development/2015/may/26/syrian-refugees-lebanon-shatila-camp-hell-water> (accessed on 5 January 2020).

39. Riachi, R. Beyond Rehashed Policies: Lebanon Must Tackle its Water Crisis Head-On. In *The Lebanese Center for Policy Studies*; 2014. Available online: <https://www.lcps-lebanon.org/featuredArticle.php?id=27> (accessed on 11 January 2019).
40. Baylouny, A.; Klingseis, S. Water Thieves or Political Catalysts? Syrian Refugees in Jordan and Lebanon. *Middle East Policy* **2018**, *25*, 104–123.
41. Minister of Energy and Water (MOEW). 2016. Available online: <http://www.energyandwater.gov.lb/ar/details/99982/> (accessed on 11 January 2019).
42. Ministry of Energy and Water (MOEW). *National Water Sector Strategy: A Right for Every Citizen, a Resource for the Whole Country*; MOEW: Beirut, Lebanon, 2010.
43. Seeliger, L.; Turok, I. Averting a downward spiral: Building resilience in informal urban settlements through adaptive governance. *Environ. Urban.* **2014**, *26*, 184–199.
44. Makdisi, K., Shibli, R., Geha, C., Gündoğar, S., Dark, S. Middle East and North Africa Regional Architecture: Mapping Geopolitical Shifts, Regional Order and Domestic Transformations in working paper No.28. In *Exploring Refugee Movements in the Middle East Regional Context: Responses to the Syrian Crisis in Lebanon and Turkey*; 2018. Available online: http://www.menaraproject.eu/wp-content/uploads/2019/01/menara_wp_28.pdf (accessed on 5 January 2020).
45. The Daily Star. Lebanon MP Blames Syrian Refugees for Litani River Pollution. In *The Daily Star Newspaper—Lebanon*; 2016. Available online: <http://www.dailystar.com.lb/News/Lebanon-News/2016/Jul-19/362851-lebanon-mp-blames-litani-river-pollution-on-syrian-refugees.ashx> (accessed on 11 January 2019).
46. The Daily Star. Berri Appeals for Arab Help on Syrian Refugee Returns. In *The Daily Star Newspaper—Lebanon*; 2019. Retrieved, from <http://www.dailystar.com.lb/News/Lebanon-News/2019/Mar-04/477951-berri-appeals-for-arab-help-on-syrian-refugee-returns.ashx> (accessed on 11 March 2019).
47. United Nation High Commissioner for Refugees (UNHCR). Lebanon Operational Update, January–June 2018—Lebanon. ReliefWeb. 2018. Available online: <https://reliefweb.int/report/lebanon/unhcr-lebanon-operational-update-january-june-2018> (accessed on 11 March 2019).
48. Government of Jordan. *Jordan Response Plan 2018–2020*; Government of Jordan: Amman, Jordan, 2017.
49. Mercy Corps. *Tapped Out: Water Scarcity and Refugee Pressures in Jordan*; Mercy Corps: Amman, Jordan, 2014.
50. Francis, A. *Jordan's Refugee Crisis*; Carnegie Endowment for International Peace: Washington D.C., USA, 2015.
51. Namrouqa, H. Jordan world second water-poorest country. Available online: <http://www.jordantimes.com/news/local/jordan-world%E2%80%99s-second-water-poorest-country?> (accessed on 5 January 2020).
52. Namrouqa, H. Jordan needs \$750m to meet water demand over next three years. Available online: <https://www.jordantimes.com/news/local/jordan-needs-750m-meet-water-demand-over-next-three-years%E2%80%99> (accessed on 5 January 2020).
53. Namrouqa, H. Jordan seeks self-reliance in water sector—Ghezawi. Available online: <http://www.jordantimes.com/news/local/jordan-seeks-self-reliance-water-sector-%E2%80%94-ghezawi> (accessed on 5 January 2020).
54. Namrouqa, H. Only 8% of \$750 million water response plan covered by int'l community. Available online: <http://www.jordantimes.com/news/local/only-8-750-million-water-response-plan-covered-intl-community> (accessed on 5 January 2020).
55. The Jordan Times (JT). Contracted aid for kingdom up in 2017, but grants directed to support budget shrink. Available online: <https://www.jordantimes.com/news/local/contracted-aid-kingdom-2017-grants-directed-support-budget-shrink> (accessed on 5 January 2020).
56. Jordan's Ministry of Water and Irrigation (MWI). *National Water Strategy 2016–2025*; MWI: Amman, Jordan, 2016; p. 30.
57. Malkawi, K. Available online: <https://www.jordantimes.com/news/local/10-year-strategy-aimed-increasing-kingdom%E2%80%99s-water-resources> (accessed on 5 January 2020).



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).