



Palestinian National Authority
Palestinian Water Authority



السلطة الوطنية الفلسطينية
سلطة المياه الفلسطينية



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An Analysis of Water Use, Livelihoods and Local Stakeholders in Palestine



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<p>The SUSMAQ Project The aim of the project is to increase understanding of the sustainable yield of the West Bank and Gaza aquifers under a range of future economic, demographic and land use scenarios, and to evaluate alternative groundwater management options. The project is interdisciplinary, bringing together hydrogeologists and groundwater modellers with economists and policy experts. In this way, hydrogeological understanding can inform, and be informed by, insights from the social sciences. The results of the study will provide support to decision-making at all levels in relation to the sustainable yield of the West Bank and Gaza aquifers.</p> <p>The project runs from November 1999 to October 2004, and is a partnership between the Palestinian Water Authority, University of Newcastle upon Tyne. The project is funded by the United Kingdom Government’s Department for International Development (DfID).</p>	<p>Project Results Dissemination The project disseminates its results through the project website www.ncl.ac.uk/susmaq, newsletters, workshops, technical meetings, publications in conference and scientific journals.</p>
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Acronyms

BGS	British Geological Survey
CWB	Central West bank
DFID	Department for International Development
FAO	Food and Agriculture Organisation of the United Nations
GDP	Gross Domestic Product
GIS	Geographical Information System
GNI	Gross National Income
GS	Gaza Strip
HEPG	Humanitarian Emergency and Policy Group
HH	Household
IMF	International Monetary Fund
JD	Jordanian Dinars
JWU	Jerusalem Water Undertaking
LACC	Local Aid Coordination Committee
MAS	Palestine Economic Policy Research Institute
MCM	Million Cubic Metres
MLG	Ministry of Local Government
MO	Management Options
NGO	Non governmental organisation
NIS	New Israeli Shekels
NWB	North West Bank
OPT	Occupied Palestinian Territories
PARC	Palestinian Agricultural Relief Committees
PCBS	Palestinian Central Bureau of Statistics
PECDAR	Palestinian Economic Council for Development and Reconstruction
PNA	Palestinian National Authority
PWA	Palestinian Water Authority
RWU	Ramallah Water Undertaking
SUSMAQ	Sustainable Management of the West Bank and Gaza Aquifers Project
SWB	South West Bank
SWU	Southern Water Undertaking
UNCTAD	United Nations Conference on Trade and Development
UNSCO	UN Office of the Special Coordinator
US	United States
WB	West Bank
WBGS	West Bank Gaza Strip
WBWD	West Bank Water Department

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Disclaimer

As authors, we are solely responsible for the contents and any errors and omissions herein. The report neither reflects the views nor policies of any contributing organisation nor of DFID. Borders represented in maps produced or reproduced herein do not purport to designate the official boundaries between states or state-entities in the region.

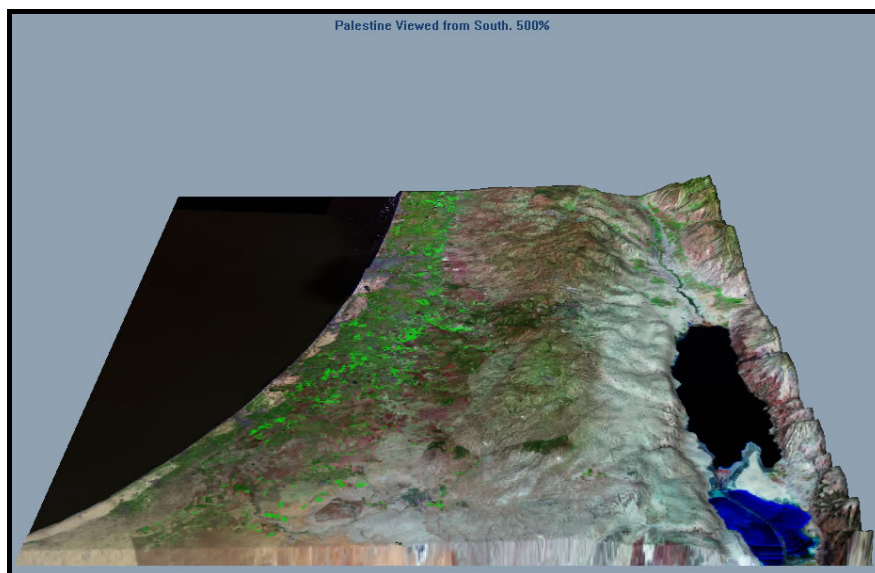


Fig. 1: Digital elevation image of Palestine/Israel showing Jordan Valley, WB mountain ridge and coastal plain (South-North aspect).

To the right is the Red Sea (blue), Dead Sea (black) and River Jordan (above Dead Sea); to the left, the Mediterranean. (© Jon Aldridge)

¹ Tayseir Saker, Mohammed Alagha, Hassan Ladadweh, Osama Ja'fary, Mustafa Khwaja, Walid Musa, Abed Aljabarin, Souad Abukamleh, Salim Karmi and Ghada Faraj.

1 Executive Summary

This report was produced at a time of acute economic and social deprivation in the West Bank (WB) and Gaza Strip (GS)² caused by occupation and Israeli reaction to the second *intifada*. The findings presented should be understood in this context. In spite of the acute situation in which the research was carried out the authors believe that the results may help future Palestinian water managers from national down to local levels by providing new and comparative data on links between water and livelihoods at a local level.

Whilst the situation occasions considerable pessimism, the authors are keen to strike an optimistic note on future development options, including highlighting ways in which effective local water management can be achieved in support of a wide range of household livelihood activities.

Focusing on the micro-level demand for water generated by domestic and small-scale water users, this report is one output of the Management Options (MO) component of the Sustainable Management of the West Bank and Gaza Aquifers Project (SUSMAQ). The project was funded by the UK Department for International Development (DFID) and the current research work was begun in 2003. Most fieldwork was conducted in the mid part of the year. Yasser Shalabi led the research team in Ramallah and Alan Nicol provided overall coordination from the UK. Combining qualitative case-study analysis and a quantitative survey of 2,316 households across the WBGS, the research was complemented by four one-day stakeholder workshops held in the north, central, and southern regions of the WB and in the GS.

Beyond the immediate problems of Israel's occupation a picture emerged of institutional complexity at a local level coupled with important regional differences in the way communities and households managed and made use of water sources. This complexity and regionalism represents a significant management challenge for the Palestinian Water Authority (PWA) and suggests the need for localised management structures to be carefully supported—and regulated—including making allowance for local systems of ownership, management, allocation and tariff systems that reflect local circumstances. This represents a call for more decentralised structures of water management that promote wider stakeholder involvement and are equipped to deal with differing views within communities on management processes given the often heterogeneous nature of these communities. In Bedan, for instance, in the SWB the case study showed how major differences of opinion may exist across a community between different livelihood users; farmers wishing to develop water sources for irrigation in dispute with tourism operators keen to protect existing spring structures and supply mechanisms which helped to draw in visitors.

In so far as the decision support tool (DST) being developed by SUSMAQ helps to articulate options available and the differences between environmental, social and economic sustainability indicators the DST may be able to contribute significantly to articulating options available to users down even to the community level and thereby help to resolve disputes between competing stakeholders. To do so it needs to be informed as much as possible by local experience. The findings of this report therefore feed into SUSMAQ Report # 53 on Evaluation of Socio-economic Basic Indicators for Specific Scenarios.

² Commonly known as the Occupied Palestinian Territories (OPT).

Our conclusions cover two main areas: the relationship between the resource base and user communities, and the institutional structures of management at a local level.

The resource base and user community

Local water sources in most communities provided a key resource for small-scale, household horticulture and other related activities. Most of these activities used non-network sources and relied on local, private initiative to ensure a regular supply of water. Under conditions of closure and restrictions on movement across the WBGs these activities provided an increasingly important feature of livelihood security for households as their income-earning or subsistence activities turned to the use of local natural capital assets. However, these activities still remained relatively insignificant in terms of overall household income, given the low value of the produce and availability of marketing networks.

In many cases where there was some irrigation this was in small gardens averaging just 0.3 dunums³, with regional variation from 0.46 dunums in the CWB to just 0.09 dunums in the GS. Other livelihood occupations and income sources were substantially more important in ensuring household livelihood security ranging from public sector work (21.5% of respondents), to social assistance (28.5%) and private sector work (28.8%). Own cultivation represented a fairly low 13.5%. The regional picture was significant, however, being far higher in the NWB⁴ (22.7%) than in the GS (12.8%), and just 4.3% in the CWB.

Remittance income also showed important regional variation with higher income from abroad in the CWB (19.6%) as opposed to just 4.5% in the GS, the next highest. Reflecting the more ingrained poverty in the GS and the lack of access to income alternatives—for instance the relative lack of small-scale household gardens—social assistance was highest in the GS at 43.8%, next highest in the SWB at 30.1%, down to 22.7% in the NWB and just 10.2% in the CWB. The impact of the *intifada* revealed a sharp decline in income levels overall with the accrual of monthly deficits (income against expenditure) by households of some 3.2% but, in some regions, this was far higher—e.g. 15.4% in the CWB, 12.7% in the SWB, although only 1.41% in the NWB.

There were significant regional variations in sources used according to different levels of network development, hydro-geological conditions and rainfall patterns. Some 82% of households stated that the public network was their main source of domestic water, by far the highest in the CWB (92.3%) and lowest in the SWB (62.9%). Additional main sources were only noted in the SWB where 16.7% stated that rainwater collection (cisterns) or tankers were their main other sources of domestic water (20%), reflecting both network water cost and the limits to network supplies in this region. Only in a few communities visited in the case studies did public network water irrigate crops, most notably in the SWB—Halhoul and Sae'r—and in Dora al-Qara' (CWB).

In the month of July 2003 the recorded average household volume used (for all purposes) was 23.44 m³, from public water, followed by various wells (11.59 m³), rainwater harvesting and tankers (3.8 m³) and springs (1.53 m³). Based on an average household size in the survey of 6.3 persons this works out at some 120 lpcd, though roughly halved for the SWB. Whilst this figure looks relatively high it was for all uses, including livelihood uses, and therefore reflected a 'grey area' of consumption between domestic and household livelihood use which included small gardens and livestock. This will be a key policy issue for future tariff structures and for any PWA attempt to 'enclose' and regulate currently open- or private-access small sources.

³ 1 dunum is the equivalent of 1,000 m², or 0.1 hectares.

⁴ NWB = North West Bank; CWB = Central West Bank; SWB = South West Bank.

At the same time research results suggested that there was relatively little suppressed demand for agricultural water, with a far higher proportion of respondents stating that they would primarily put any additional water supplied to domestic use (22.2%), though varying significantly by region (lower in the NWB (11.7%) than in the SWB (32.9%) and GS (29.5%)). Future usage in irrigated agriculture was a preference for just 2.6% of households in the SWB, the highest figure overall. This may relate to the cost of network water as well as to the relatively low proportion of the population interested in expanding current agricultural activities. At the same time, given the ‘grey area’ noted above it could also be put to other livelihood uses including cottage industries and small-scale horticulture.

In household expenditure, the average sum spent on public network water each month varied widely. Calculating public network water use by monthly cost, it appeared that the CWB and SWB households were paying some NIS 4.72 and NIS 4.15 respectively per cubic metre, the NWB NIS 3.99 and GS households just NIS 1.05, against a national average of NIS 2.6. These figures need further verification, but the spread indicates broadly different pricing indicators available to consumers which would affect future usage in a variety of income-earning activities, including tendencies towards using substantial quantities of network water to be used in agriculture.

Aside from the water equation, an additional factor affecting future development of agriculture is the continued fragmentation of land holdings. The survey revealed that 40% of respondents had agricultural land holdings of just 4 dunums yet the amount irrigated was just 10% of that illustrating the low-level of irrigated agriculture and relatively small size of available holdings. Total holdings varied between an average of just over eight dunums in the NWB to just 1,14 dunums in the GS and 2.76 dunums in the CWB (against a WB average of 5.45 dunums). In some case studies examined land fragmentation had occurred to such an extent that small plots became virtually unviable and so were given up to larger scale farmers within families who would then introduce economies of scale and irrigate from public network water. Dora Al-Qara’ was one such example in the CWB where this situation had caused knock-on problems of over-demand on the public network which had affected supplies to households within the community. This neatly illustrated the complexity of local livelihoods, land and water management issues.

Institutional arrangements

The institutional arrangements surrounding land and water management across the territories were extremely diverse, both in the number and type of stakeholders involved and in the way resources were managed and allocated, ranging from individual usage to communities of users. This diversity of existing arrangements suggested the need for localised and stakeholder-informed processes but within a national framework which could incorporate diverse local interests yet help to provide guidance on compliance with national policy, water laws and regulatory frameworks.

The primary institutional variation was in structures of ownership. These varied from individual to community and municipal control, and in some cases private owners were under contract to provide from private wells to municipal users (for instance in Abasan al-Kabira east of Khan Younis in the GS). Generally resource owners controlled distribution and tariffs, frequently under unwritten rules between extended families. Where extensive fragmentation of land had taken place within these families the local management picture had become particularly complex and dynamic—changing as land plots exchanged hands within and between families. There was almost unanimous agreement amongst key informants that fees could not be imposed on water use from such sources as this would infringe private property ‘title’. In fact tariff structures and the imposition of fees is likely to be a major area of future contestation between local management entities—whether private farmers supplying from wells, local cooperatives or shareholder associations—and municipalities or village councils and the PWA. Stepped tariffs, rates per volume or their approximate ‘pump hour

equivalent' varied widely across the WBGs from NIS 2-7 a cubic metre. Sometimes though not always, rates varied according to usage with lower rates for domestic use and higher for agricultural use.

Some local management structures had mechanisms to respond to shortage, introducing new systems of irrigation 'minutes', for instance, such as used by Wadi Al-Fara' Council (NWB), which gave priority to domestic needs in the first instance. However, there was also evidence that some private owners used periods of shortage to exploit demand by raising tariffs causing resentment at a local level. This would again suggest the need for a national framework which supported local communities whilst helping to guide managers of the resource without unduly imposing rules and norms established and agreed nationally. Clearly there is something of a tightrope to be walked here, but certainly effective stakeholder meetings such as those organised under this research showed the value of local dialogue about such issues. Finding ways of formalising such meetings would be an important step forwards.

One of the most effective processes that stakeholder-driven management could advance is the role of women in small-scale irrigated agriculture, a finding which emerged strongly from the case studies. Key informants noted that not only did women perform the bulk of agricultural work in communities such as Falamia (NWB) (up to 30% of the labour force in the sector), as men had previously worked in Israel, but that in villages such as Artas (SWB) many women cultivated and marketed their own produce (parsley, mint, radishes, etc) in towns including Jerusalem and Bethlehem. In some cases this was in response to demand—such as in Batir (SWB)—where Israeli demand for organic Palestinian produce had prompted increased investment in greenhouses and drip irrigation as well. However, it was noted in some case studies, that one negative impact of the second *intifada* had been to diminish the role played by women as men returned to—and took control again over—commercial agricultural production in some cases.

Spring sharing arrangements in particular varied greatly, and could be measured in pump hours of water supplied, irrigation 'days' or by water allocations according to land holdings. Sometimes there would be a combination of allocation mechanisms. In many cases these arrangements were in unwritten agreements between extended families making regulation and control not simply a management issue but a highly localised political issue as well. In other cases the systems were large-scale and formalised, with hundreds of farmers involved in the Ein as-Sultan cooperative in Jericho, for example. Here the relationship was particularly complex because of linkage to Municipal supply, complex methods of distribution based on land title and use and the fact that new investment to improve management of the resource (shifting from open channels to piped water) was begin to challenge the vested interests of more powerful farmers within the cooperative.

Stakeholder meetings across the WBGs revealed a range of management concerns including the need to improve existing PWA management, which was generally regarded as poorly coordinated, overly centralised and lacking key managerial and technical capacity within local authorities (both municipalities and councils). At user-level key concerns included inadequate and outdated networks and irrigation distribution systems, as well as a lack of a regulatory authority to deal with illegal connections. Stakeholders called for greater leadership on strategy and policy, improved institutional clarity on overlapping roles and responsibilities between water sector institutions and improved coordination outside the water sector. A unified pricing policy and stricter regulatory environment would serve more efficient and effective management of the resource and control of wastewater discharge from Israeli settlements should be a priority in vulnerable areas. Overall the need to link management approaches to other sectors and poverty reduction initiatives should become a key feature of future resource development.

Future developments

Future sectoral development will inevitably be affected by the broader socio-economic direction Palestine takes, not least in terms of the political feasibility of different management options. The current relationship to the resource base and institutional arrangements in place point to certain future directions for policy development, which are outlined below.

There are few simple ‘agricultural communities’ in Palestine. A complex and diversified livelihoods picture emerges connected to well-established resource management environments, particularly in areas with many smaller-scale farms. Longer-term resource management decisions will be dominated by the trade-offs between individual decisions on livelihood options available—whether, for instance, produce and goods can be marketed in Israel or elsewhere and/or people export their own labour power or find employment in different local sectors—and Israeli and Palestinian government actions on the other. Whether Israeli border controls provide incentive or note to migrate for employment and/or whether the incentives, subsidies and policies of the PNA (or future Palestinian State) push or pull people out of or into different livelihood occupations within the WBGs. One of the key issues emerging with respect to agriculture which is of major future importance to the sector’s development is the age-occupation of the sector, which has come to be dominated predominantly by the elderly as revealed in many of our case study locations.

What form the sector takes will also be affected by a range of non-water factors such as market access and extension support. At present, for instance, whilst there is a rise in numbers engaged in agriculture, the commercial sector is suffering hugely from lack of market access. Towns such as Sae’r in the SWB display households with a wide variety of livelihood occupations driven by the slow decline of agriculture in the past 30 years as labour was pulled into the Israeli economy. According to our case study work the sector is now returning to prominence—but as a survival mechanism only. Access to markets is still highly restricted. In other villages such as Beitilo in the CWB, both water and land are available, but a lack of funds for land reclamation means that land is left idle (which has led to attempts by adjoining settlements to encroach). Future decisions on agricultural activity may therefore be guided as much by direct government—or NGO—support to sectoral marketing and investment as they are by the incentives or disincentives which water pricing may provide.

It will be important to see in future how the effect of current forced return to agriculture drives new attempts at innovative approaches to production, marketing and investment, including greater use of water conservation and efficiency measures, or simply is regarded as a stop-gap until the wage labour market becomes available again in Israel (if indeed it does). One important structural shift revealed by the case studies is in the nature of marketing of agricultural produce across Palestine as a result of Israeli closures. Formerly competitive farm produce from the GS was now no longer able to compete in the WB and even within the WB farmers in Artas and Batir stated that Jenin and Tulkarem could no longer compete with local produce, allowing some local farmers to sell more of their produce. In an area such as Jericho, the case studies also showed how farming is not just about local farmer livelihoods but is also connected to intra-WB movement of labour with many farmers across Palestine renting land fed by the Ein as-Sultan spring.

Under the current scenario, with Israel’s continued control over resource access and its suppression of economic development in Palestine, future development options will require that existing assets are managed locally in support of local livelihood activities. But in the longer term this fragmentation in management and use will require consolidation in order to allow decisions taken at a national and sub-national level to provide benefits at scale—i.e. including shifts in sectoral

allocations from agriculture to domestic use of from industry to environmental flows, for instance. As stated earlier this will need to be in tandem with local voice and control over decision making.

The development of more effective, higher-value agricultural activity is possible as shown by the development of 'organic produce' in some communities, but only within the limits of existing resource availability and the constraints imposed by existing interim allocations between Israel and the Palestinians. Whilst export-oriented agriculture (to Israel and the wider region) has good potential, particularly for high-end horticultural products, this sector could also drive the development of agro-manufacturing within Palestine providing for niche markets of high-value organic products, for instance.

At the same time the service sector economy—and in particular the private sector—has the capacity to compete at a regional level and can overcome some of the problems associated with Israeli restrictions by increasing its emphasis on localised services and the development of a knowledge-driven economy, particularly given the high educational levels in Palestine and the surfeit of graduates. The potential exists therefore to create an economy combining the development of high-value agriculture and agro-processing industries with a knowledge-driven service sector. The relationship to the resource base and water in particular, can be tailored to this sectoral development pattern in coming years, including greater attention to environmental protection and conservation to allow the development of environmental capital that can help to support tourism within Palestine⁵.

Under a final peace agreement and a viable Palestinian state, the future for water and livelihoods in Palestine is one of complex patterns of demand and supply across a range of sectors, but managed locally with central support. Whilst there is a need to introduce higher value added per 'drop' as a principle, this should not become an overriding concern and the assumptions should not be that higher value is always found outside the agricultural sector. Where water is used in local agricultural production this can be integrated with other sectoral development in manufacturing (processing) industries and in tourism development, but will have to be supported by more effective extension services and government incentives to farmers to introduce more water efficiency savings in crop types and distribution systems.

The challenge for future water managers (and Management Options) in Palestine is perhaps fourfold:

1. To ensure that water is managed locally and is stakeholder-driven in order to ensure local voice in decision making;
2. To focus particular attention on the role of women as water managers, users and decision makers at a local level, and to include them on an equal basis in local management structures;
3. To create appropriate linkage across sectors such that agriculture—and other sectors including manufacturing, tourism and other service industries—are fully integrated within water sector planning and implementation processes in order to enhance added value to water use;
4. To balance the incentives for support to agriculture with disincentives to farmers who continue to produce low-end, highly water-consumptive products and/or add to environmental degradation problems.

⁵ Though rarely mentioned, the preservation of small-scale agriculture in Palestine is an important economic asset in its own right because of its link to the rural landscape of the West Bank which will be of considerable tourism value.

The results of this study may be used to begin to understand more fully the ‘grey area’ of water use in household livelihood activities and the implications for such usage on new directions to be taken in water policy reforms and laws currently. However, this is wholly contingent on a successful peace agreement between Palestine and Israel without which the outlook for the Palestinian economy and the livelihoods of local communities remains bleak.

At best such an outcome would suggest a continuing trend towards lack of institutional development and the continued fragmentation of production and management of the resource. At worst it would lead, as Roy puts it, ‘to a structure that in part is characterised by small production units using local inputs to produce for the domestic market (Roy, 2002).’ This could lock Palestine into an uncompetitive and ultimately dependent economic relationship with Israel and neighbouring countries.

As our report has shown, local level production and marketing is both a gain and a loss for producers—some are able to step in to provide for local markets they had previously been unable to sell to profitably, whilst others suffer complete loss of livelihoods. Whilst local management and stakeholder involvement is to be supported this has to be within a clear national framework for management of the resource linked to development scenarios that make the Palestinian economy and society able to compete economically at a regional and international level. Otherwise the economy will continue to run in ‘survival mode’, with little or no investment and growth, which will almost certainly mean continued degradation of its natural resource base over time and the impoverishment of the population. This is not an option to allow.

2 Introduction

Phase I of the Management Options component (1999-2002), led by the British Geological Survey (BGS), addressed the broad policy parameters facing water management and allocation in a future Palestinian State. A key objective of this phase was to “widen the policy lens through which solutions to the problem of resource scarcity and pressures are viewed, to include the evolving social and economic context from which the structure of water demand emerges” (Calow et al, 2003: 81).

Phase II built on this earlier work and identified and analysed different management options under three socio-economic scenarios:

1. A current state: characterised by the continued status quo;
2. A consolidating state: characterised by the strengthening of more effective national-level institutions, and the development of detailed policy and planning processes; and
3. A future state: under which it is assumed full Palestinian Statehood has emerged and long-term socio-economic stability has been achieved.

Phase II comprised macro and micro subcomponents, the former consisting of demand analysis under these broad socio-economic scenarios and detailed assessment of specific management options⁶, the latter focusing on local-level components of demand generated by domestic and small-scale livelihoods usage. The latter analysis incorporated the views of key local stakeholders on wider institutional issues affecting resource management⁷.

The outcome of the local analysis forms the basis for this report, and was used to assist in identifying key sets of indicators with which to identify socially sustainable management options under the three scenarios (see SUSMAQ Report #60). At a broader level, this report also seeks to inform future policy and institutional development through providing a snapshot of water and livelihoods linkages in the current Palestinian context⁸.



Fig. 2: Research team training, Ramallah (Photo A.Nicol)

⁶ This component was carried out by Miles Burton (Cowi) and Khalil Saleh (PWA).

⁷ See SUSMAQ Report # 53 for full details of the stakeholder consultations.

⁸ Most of the field research was carried out in July/August 2003.



Full report/document is not available online