

References

- Abu-Ata, Nathalie. 2005. "Water, Gender and Growth in the MENA Region." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Ahmad, M. 2000. "Water Pricing and Markets in the Near East: Policy Issues and Options." *Water Policy* 2 (3): 229–42.
- Al Abdath al Maghribia*. 2005. No. 2511, Morocco, December 15.
- Alfieri, A. 2006. "Integrated Environmental and Economic Accounting for Water Resources: Draft for Discussion." United Nations Statistics Division, New York.
- Al-Hamdi, M. I. 2000. *Competition for Scarce Groundwater in the Sana'a Plain, Yemen: A Study on the Incentive Systems for Urban and Agricultural Water Use*. Rotterdam: Balkema.
- Allan, A. 2001. *The Middle East Water Question: Hydropolitics and the Global Economy*. London and New York: I.B. Tauris.
- Al Shoura*. 1999. "Taizziyya Bloody Water Dispute." June 20.
- Al Thawra*. 1999. "Tribes in Fatal Dispute Over Land and Water." April 29.
- Arzaghi, M., and V. Henderson. 2002. "Why Countries are Fiscally Decentralizing." Department of Economics, Brown University, Providence, RI.
- AWC (Arab Water Council). 2004. *State of Water in the Arab Region*. Cairo: AWC.

———. 2006. *MENA Regional Report*. Cairo: AWC.

AWC, UNDP (United Nations Development Programme), and CEDARE (Center for Environment and Development for the Arab Region and Europe). 2004. "Status of Integrated Water Resources Management Plans in the Arab Region." Draft Report. Cairo.

Bahamish, A. 2004. "Legal Survey of Existing Traditional Water Rights in the Spate Irrigation Systems of Wadi Zabid and Wadi Tuban." Interim Report. Ministry of Agriculture and Irrigation, Irrigation Improvement Project, Yemen.

Baietti, A., W. Kingdom, and M. van Ginneken. 2006. "Characteristics of Well-Performing Public Water Utilities." Water Supply and Sanitation Working Notes, Note No. 9. World Bank, Washington, DC.

Baroudy, E., A. Abid Lahlou, and B. Attia. 2005. *Managing Water Demand: Policies, Practices, and Lessons from the Middle East and North Africa Forums*. London: IWA Publishing/IDRC.

Bastiaanssen, W. 1998. *Remote Sensing Water Resources Management: The State of the Art*. International Water Management Institute, Colombo, Sri Lanka.

Bayat, A., and E. Denis. 2000. "Who is Afraid of Ashwaiyyat? Urban Change and Politics in Egypt." *Environment and Urbanization* 12 (2): 185–99.

Bazza, M., and M. Ahmad. 2002. "A Comparative Assessment of Links between Irrigation Water Pricing and Irrigation Performance in the Near East." Paper presented at the Conference on Water Policies: Micro and Macro Considerations. Agadir, Morocco, June 15–17.

Becker, G. 1983. "A Theory of Competition among Pressure Groups for Political Influence." *Quarterly Journal of Economics* 98 (3): 371–400.

Benblidia, M. 2005a. "Les Agences de Bassin en Algérie." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.

- . 2005b. “Coopération pour la gestion d’un aquifère international entre l’Algérie, la Tunisie et la Libye.” Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Blackmore, Don, and Chris Perry. *The Economist*, July, unpublished. 2003. Letter to the Editor.
- Blomquist, W. A., A. Dinar, and K. Kemper. 2005. “Comparison of Institutional Arrangements for River Basin Management in Eight Basins.” World Bank Policy Research Working Paper No. 3636, World Bank, Washington, DC.
- BNWP (Bank–Netherlands Water Partnership). 2006. “Modes of Engagement with Public Sector Water Supply and Sanitation in Developing Countries: A Case Study.” Washington DC: World Bank.
- Bouhamidi, R. 2005. “Morocco Water Concessions Case Study.” Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. World Bank, Washington, DC.
- Bou-Zeid, E., and M. El-Fadel. 2002. “Climate Change and Water Resources in the Middle East: A Vulnerability and Adaptation Assessment.” *Journal of Water Resources Planning and Management* 128 (5): 343–55.
- Burchi, S. 2005. “The Interface Between Customary and Statutory Water Rights: A Statutory Perspective.” FAO Legal Papers Online No. 45.
- Bushnak, Adil. 2003. Presentation to the 3rd World Water Forum. Kyoto, Japan.
- Cacho, J. 2003. “The Supermarket ‘Market’ Phenomenon in Developing Countries: Implications for Smallholder Farmers.” *American Journal of Agricultural Economics* 85 (5): 1162–3.
- Cairncross, S. 2003. “Handwashing with Soap: A New Way to Prevent ARIs?” *Tropical Medicine and International Health* 8(8): 677–9.
- Castro, J. E. 2006. “Institutional Development and Political Processes.” Thematic document presented at the 4th World Water Forum, Mexico City, March 16–22.

- CEDARE (Center for Environment and Development for the Arab Region and Europe). 2005. "Status of Integrated Water Resource Management Plans." CEDARE, Cairo.
- . 2006. *Water Conflicts and Conflict Management Mechanisms in the Middle East and North Africa Region*. Cairo: CEDARE.
- CENESTA (Centre for Sustainable Development). 2003. "Proposal for a Candidate Site of Globally Important Ingenious Agricultural System: Qanat Irrigation Systems." Islamic Republic of Iran.
- Chapagain, A. K., and A. Y. Hoekstra. 2003. "Virtual Water Flows Between Nations in Relation to Trade in Livestock and Livestock Products." Value of Water Research Report Series No. 13, IHE, Delft, the Netherlands.
- Cioffi, A., and C. dell'Aquila. 2004. "The Effects of Trade Policies for Fresh Fruit and Vegetables of the European Union." *Food Policy* 29: 169–85.
- Codron, J.-M., Z. Bouhsina, F. Fort, E. Coudel, and A. Puech. 2004. "Supermarkets in Low-Income Mediterranean Countries: Impacts on Horticulture Systems." *Development Policy Review* 22 (5): 587–602.
- Control Risks Group. 2005. "Political Economy of Water Reforms in Algeria." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Dasgupta, S., H. Wang, and D. Wheeler. 2005. "Disclosure Strategies for Pollution Control." In *The International Yearbook of Environmental and Resource Economics 2005/2006: A Survey of Current Issues* (New Horizons in Environmental Economics), ed. Tom Tietenberg and Henk Folmer. Cheltenham, UK: Edward Elgar.
- de Janvry, A., C. Dutilly, C. Muñoz-Piña, and E. Sadoulet. 2001. "Liberal Reforms and Community Responses in Mexico." In *Communities and Markets in Economic Development*, ed. M. Aoki and Y. Hayami, 318–44. Oxford: Oxford University Press.
- Decker, C. 2004. "Managing Water Losses in Amman's Renovated Network: A Case Study." Paper prepared for the International Water Demand Management Conference, Dead Sea, Jordan, May 30–June 3.

- Doukkali, M. R. 2005. "Water Institutional Reforms in Morocco." *Water Policy* 7 (11): 71–88.
- Doumani, F., A. Bjerde, and L. Kirchner. 2005. "Rural Water Supply, Sanitation and Hygiene." Advisory Note, World Bank, Washington, DC.
- Easter, K. W., M. Rosegrant, and A. Dinar, eds. 1998. *Markets for Water: Potential and Performance*. Norwell, MA: Kluwer Academic Publishers.
- . 1999. "Formal and Informal Markets for Water: Institutions, Performance and Constraints." *The World Bank Research Observer* 14 (1): 99–116.
- Ecology and Environment, Inc. 2003. "Etude du Plan National de Protection de la Qualité des Ressources en Eau." Mission IV. Elaboration du Plan de Protection de la Qualité de l'Eau de la Région Hydraulique de l'Oum Er Rbia. Final Report, Rabat, Morocco.
- Elhadj, Elie. 2005. "Experiments in Achieving Water and Food Self-Sufficiency in the Water Scarce Middle East." PhD thesis, The University of London School of Oriental and African Studies.
- El-Quosy, Dia El Din. 2004. *Wastewater Management and Re-use Assessment for the Mediterranean*. Cairo: CEDARE.
- Esrey, S. 1996. "Water, Waste and Well-Being: A Multi-Country Study." *American Journal of Epidemiology* 143(6): 608–23.
- Falkenmark, M., J. Lundquist, and C. Widstrand. 1989. "Macro-Scale Water Scarcity Requires Micro-Scale Approaches: Aspects of Vulnerability in Semi-Arid Development." *Natural Resources Forum* 13 (4): 258–67.
- FAO AQUASTAT Database. <http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm> (accessed June 12, 2006).
- FAOSTAT Food Balance and Production Database. FAO. <http://faostat.fao.org> (accessed June 12, 2006).
- Faruqui, N. I., A. K. Biswas, and M. J. Bino, eds. 2001. *Water Management in Islam*. New York: United Nations University Press.
- Feitelson, E. 2005. "Political Economy of Groundwater Exploitation: The Israeli Case." *Water Resources Development* 21 (3): 413–23.

- Feitelson, E., and U. Shamir, eds. Forthcoming. *Water for Dry Land*. Washington, DC: Resources for the Future Press.
- Fischhendler, I. Forthcoming. "The Politics of Water Allocation in Israel." In *Water for Dry Land*, ed. E. Feitelson and U. Shamir. Washington, DC: Resources for the Future Press.
- Fraile, I. 2006. "Water Management in Spain." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Fraser, C., and S. Restrepo Estrada. 1996. *Communication for Rural Development in Mexico in Good Times and in Bad*. FAO: Rome.
- Friesen, C., and W. Scheumann. 2001. "Institutional Arrangements for Land Drainage in Developing Countries." Working Paper 28, International Water Management Institute, Colombo, Sri Lanka.
- Gleick, P., ed. 1993. *Water in Crisis*. New York: Oxford University Press.
- . 1996. "Basic Water Requirements for Human Activities: Meeting Basic Needs." *International Water* 21 (2): 83–92.
- Global Water Intelligence. 2004. *Tariffs: Half Way There*. Oxford, UK: Global Water Intelligence.
- Government of Libya. 2005. "Libyan National Economic Strategy: Agricultural Competitiveness Assessment." Draft Report. Tripoli.
- GTZ (German Agency for Technical Cooperation). 2005. "Project Concept Document for Management of Water Resources in Irrigated Agriculture in Jordan." GTZ, Eschborn.
- Gurria, A., and P. Van Hofwegen. 2006. *Task Force on Financing Water for All*. World Water Council. Marseilles.
- Haddadin, M. 2002. "Water Issues in the Middle East: Challenges and Opportunities." *Water Policy* 4 (3): 205–22.
- Hamdane, A. 2002. "Irrigation Water Pricing Policy in Tunisia." FAO, Regional Office for the Near East, Cairo, Egypt.

- Hodgson, S. 2004. "Land and Water—The Rights Interface." Livelihood Support Programme Working Paper 10, FAO, Rome.
- Hoekstra, A. Y., and P. Q. Hung. 2002. "Virtual Water Trade: A Quantification of Virtual Water Flows between Nations in Relation to International Crop Trade." Value of Water Research Report Series No. 11, IHE, Delft, the Netherlands.
- Human Rights Watch. 2003. "The Iraqi Government Assault on the Marsh Arabs." A Human Rights Watch Briefing Paper. Available at <http://www.hrw.org/backgrounders/mena/marsharabs1.htm>.
- Humpal, D., and K. Jacques. 2003. "Draft Report on Bumpers and Import Sensitivity Analysis for Moroccan Table Olives and Olive Oil." Prepared for USAID.
- IBNET database. <http://www.ib-net.org/en/search/index.php?L=3&S=1> (accessed May 2005).
- ICID (International Commission on Irrigation and Drainage) database. http://www.icid.org/imp_data.pdf (accessed January 2006).
- ICOLD (International Commission on Large Dams). 2003. World Register of Dams. Paris.
- IDB (Islamic Development Bank). 2005. "Managing Water Resources and Enhancing Cooperation in IDB Member Countries." Occasional Paper No. 11. Jeddah: IDB.
- IFRC (International Federation of Red Cross and Red Crescent Societies). 1996. "Kingdom of Morocco: Floods." Preliminary Appeal No 02/96. IFRC, Geneva.
- IJHD (International Journal of Hydropower and Dams). 2005. *World Atlas and Industry Guide*. Surrey, United Kingdom: Aqua-Media International.
- India, Ministry of Rural Development. n.d. "Sector Reforms—Community Participation in Rural Water Supply Program." Department of Drinking Water Supply. Available at <http://ddws.nic.in/Data/SecRef/REFORMS.htm>.

- INPIM (International Network on Participatory Irrigation Management). 2005. "Aflaj Irrigation Systems." INPIM Newsletter No. 12. Washington, DC. Available at <http://www.inpim.org/leftlinks/FAQ/Newsletters/N12/n12a9>.
- Iran Water Management Company. 2006. "The Statistics of Water Supply Projects, Main Irrigation Network and Hydropower Plants." Tehran, Iran.
- Islamic Republic of Afghanistan. Ministry of Energy and Water. 2005. "Regional cooperation on the energy and water sector." Concept paper.
- IWMI (International Water Management Institute). 1999. Podium Policy Dialogue Model.
- Johnson, S. H. 1997. "Irrigation Management Transfer in Mexico: A Strategy to Achieve Irrigation District Sustainability." Research Report No.16, International Irrigation Management Institute, Colombo, Sri Lanka.
- Kähkönen, S. 1999. "Does Social Capital Matter in Water and Sanitation Delivery? A Review of the Literature." Social Capital Initiative Working Paper No. 9, World Bank, Washington, DC.
- Kaufmann, D., A. Kraay, and P. Zoido-Lobaton. 1999. "Governance Matters." Policy Research Working Paper No. 2196, World Bank, Washington, DC.
- Kayyal, Mohamad K., and S. Khaled. 2006. "Comparative Study for Selection and Replacement of Water Meters in Syria." Damascus Water Supply and Sanitation Authority Report to the Ministry of Housing and Construction, Syrian Arabic Republic.
- Kemper, K., A. Dinar, and W. Blomquist. 2005. *Institutional and Policy Analysis of River Basin Management Decentralization*. Washington, DC: World Bank.
- Ketti, D. 2002. *The Transformation of Governance*. Baltimore: Johns Hopkins Press.
- Kingdom of Saudi Arabia. 2004. "A Glimpse of the Water Projects in the Kingdom of Saudi Arabia." Ministry of Water and Electricity, Riyadh.

- Komives, K., V. Foster, J. Halpern, and Q. Wodon. 2005. *Water, Electricity, and the Poor: Who Benefits from Utility Subsidies?* Washington, DC: World Bank.
- Krishna, R., and S. M. A. Salman. 1999. "International Groundwater Law and the World Bank Policy for Projects on Transboundary Groundwater." In *Groundwater: Legal and Policy Perspectives, Proceedings of a World Bank Seminar*, ed. S. Salman, 183–4. Washington, DC: World Bank.
- Kuwait Ministry of Energy and Water. 2003. "Statistical Yearbook." Kuwait City, Kuwait.
- Kydd, J., and S. Thoyer. 1992. "Structural Adjustment and Moroccan Agriculture: An Assessment of the Reforms in the Sugar and Cereal Sectors." Working Paper No. 70, OECD Development Centre, Paris.
- Lichtenthaler, Gerhard. 2003. *Political Ecology and the Role of Water: Environment, Society and Economy in Northern Yemen*. Hants, UK: Ashgate Publishing.
- Lipchin, C. D., R. Antonius, K. Rishmawi, A. Afanah, R. Orthofer, and J. Trottier. 2004. "Public Perceptions and Attitudes towards the Declining Water Level of the Dead Sea Basin: A Multi-Cultural Analysis." Paper presented at Palestinian and Israeli Environmental Narratives, York University, Toronto, December 5–8.
- Llamas, M. R., and P. Martinez-Santos. 2005. "Intensive Groundwater Use: Silent Revolution and Potential Source of Conflicts." *Journal of Water Resources Planning and Management* 131 (5): 337–41.
- Lofgren, H., R. Doukkali, H. Serghini, and S. Robinson. 1997. "Rural Development in Morocco: Alternative Scenarios to the Year 2000." Discussion Paper No. 17, IFPRI, Washington, DC.
- Macoun, A., and H. El Naser. 1999. "Groundwater Resources Management in Jordan: Policy and Regulatory Issues." In *Groundwater: Legal and Policy Perspectives, Proceedings of a World Bank Seminar*, ed. S. Salman, 105–11. Washington, DC: World Bank.
- Malkawi, S. 2003. "Water Authority of Jordan." Jordan Country Paper presented at the Regional Consultation to Review National Priorities and Action Plans for Wastewater Re-use and Management, Amman, October 20–22.

- Mariño, M., and K. Kemper. 1999. "Institutional Frameworks in Successful Water Markets: Brazil, Spain, and Colorado, USA." World Bank Technical Paper No. 427, World Bank, Washington, DC.
- Maroc MATEE (Ministère chargé de l'Aménagement du Territoire, de l'Eau et de l'Environnement). 2004. *L'Agence du Bassin Hydraulique de l'Oum-Er Rbia, Pour une gestion intégrée, rationnelle et un développement durable des ressources en eau*. Beni Millal, Morocco.
- Meinzen-Dick, R., and B. R. Bruns. 2000. *Negotiating Water Rights*. Warwickshire, UK: ITDG Publishing.
- METAP (Mediterranean Environmental Technical Assistance Program) country profiles database. <http://www.metap.org> (accessed January 2006).
- Ministry of Water and Electricity, Saudi Arabia. 2004. "A Glimpse of the Water Projects in the Kingdom of Saudi Arabia." Riyadh.
- Moench, M. 2002. "Water and the Potential for Social Instability: Livelihoods, Migration and the Building of Society." *Natural Resources Forum* 26 (3): 195–204.
- Mohamed, A. S. 2000. *Water Demand Management: Approach, Experience, and Application to Egypt*. Amsterdam: Delft University Press.
- Morocco. 2006. *50 years of Human Development. Perspectives to 2025*. Available at <http://www.rdh50.ma/Fr/index.asp>.
- Muaz, S. 2004. "The Impact of Euro-Mediterranean Partnership on the Agricultural Sectors of Jordan, Palestine, Syria, Lebanon and Egypt (The Case of Horticultural Exports to EU Markets)." FEMISE Research No. FEM21-03, Royal Scientific Society, Jordan.
- Murakami, M. 1995. *Managing Water for Peace in the Middle East*. Tokyo: United Nations University Press.
- Nile Basin States (Council of Ministers of Water Affairs of the Nile Basin States). 1999. "Policy Guidelines for the Nile River Basin Strategic Action Program." Available at <http://www.africanwater.org/Nile-TACPolicyGuidelines.html>.
- North, D. C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

- Odeh, N. 2005. "Historical Role of Water in Settlement and Institutional Structure in the Middle East and North Africa Region." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Ohlsson, L., and A. R. Turton. 1999. "The Turning of a Screw: Social Resource Scarcity as a Bottleneck in Adaptation to Water Scarcity." Occasional Paper Series, School of Oriental and African Studies Water Study Group, University of London.
- Olson, M. 1984. *The Rise and Decline of Nations*. New Haven: Yale University Press.
- Owaygen, M., M. Sarraf, and B. Larsen. 2005. "Cost of Environmental Degradation in the Hashemite Kingdom of Jordan." Unpublished METAP Report, Washington, DC. Summary available at <http://www.metap.org/files/COED/Country%20Profiles/COED%20Jordan%20profile%20June%2019.pdf>.
- Pearce, F. 2004. *Keepers of the Spring: Reclaiming Our Water in an Age of Globalization*. Washington, DC: Island Press.
- Perry, C. J. 1996. "Alternative Approach to Costs Sharing for Water Services to Agriculture in Egypt." Research Report No. 2, International Irrigation Management Institute, Colombo, Sri Lanka.
- . 2001. "Charging for Irrigation Water: The Issues and Options, with a Case Study from Iran." IWMI Research Report No. H 27766, IWMI, Colombo, Sri Lanka.
- Pohlmeier, L. 2005. "Egypt—Agricultural Cooperatives—An Overview." Unpublished, independent consultant for GTZ, Cairo, Egypt.
- Radwan, S., and J. L. Reiffers. 2003. "The Impact of Agricultural Liberalization in the Context of the Euro-Mediterranean Partnership." FEMISE report, Cairo and Marseilles. Available at <http://www.femise.org/PDF/femise-agri-gb.pdf>.
- Ravallion, M., and M. Lokshin. 2004. "Gainers and Losers from Trade Reform in Morocco." World Bank Policy Research Working Paper 3368, World Bank, Washington, DC.

- Reisner, M. 1986. *Cadillac Desert: The American West and its Disappearing Water*. New York: Penguin Books.
- République Algérienne Démocratique et Populaire. Ministère de l'Aménagement du Territoire et de l'Environnement, 2002. *Plan National d'Actions pour l'Environnement et le Développement Durable*. Algiers.
- Roe, T., A. Dinar, Y. Tsur, and X. Diao. 2005. "Feedback Links between Economy-Wide and Farm-Level Policies: With Application to Irrigation Water Management in Morocco." *Journal of Policy Modeling* 27 (8): 905–28.
- Rogers, P. 2002. *Water Governance in Latin America and the Caribbean*. Washington, DC: Inter-American Development Bank.
- Rogers, P., and P. Lydon. 1994. *Water in the Arab World: Perspectives and Prognoses*. Cambridge, MA: Harvard University Press.
- Royaume du Maroc, MATEE (Ministère de l'Aménagement du Territoire, de l'Eau et de l'Environnement). 2004. *Le Secteur de l'Eau en Chiffres*. Rabat, Morocco.
- Royaume du Maroc. n.d. *Secrétariat d'Etat Chargé de L'Eau, Missions, Réalisations et Acquis*. Rabat, Morocco.
- Ruta, G. 2005. "Deep Wells and Shallow Savings: The Economic Aspect of Groundwater Depletion in MENA Countries." Background paper to *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.
- Rygg, D. S. 2005. "Guardians of the Wells: Water, Property and Power in Amman." Masters thesis, Center for Development and the Environment, University of Oslo.
- Salami, H., and E. Pishbahar. 2001. "Changes in the Pattern of Comparative Advantage of Iranian Agricultural Products: An Empirical Analysis Based on the Revealed Comparative Advantage Indices." *Journal of Agricultural Economics and Development* 34: 67–100 (in Farsi).
- Sarraf, M. 2004. "Assessing the Costs of Environmental Degradation in the Middle East and North Africa Region." Environment Strategy Notes No. 9, World Bank, Washington, DC.

- Sarraf, M., L. Björn, and M. Owaygen. 2004. "Cost of Environmental Degradation: The Case of Lebanon and Tunisia." Environment Department Paper No. 97, World Bank, Washington, DC.
- Schiffler, M. 1998. *The Economics of Groundwater Management in Arid Countries: Theory, International Experience and a Case Study of Jordan*. GDI Book Series No. 11. London: Frank Cass Publishers.
- Shepherd, A. 2005. "The Implications of Supermarket Development for Horticultural Farmers and Traditional Marketing Systems in Asia." Rome, FAO.
- Shiklomanov, I. 1993. "World Fresh Water Resources." In *Water in Crisis*, ed. P. Gleick, 13–24. New York: Oxford University Press.
- Stone and Webster, Inc. 2004. "The Hashemite Kingdom of Jordan: Assessment of Options for the Regulatory Reform of the Water and Wastewater Sector. Sector Review and Restructuring Options Report." Submitted to the Ministry of Water and Irrigation, Government of Jordan, and the World Bank. Stone and Webster, Inc., Boston.
- Strzepek, K., G. Yohe, R. Tol, and M. Rosegrant. 2004. "Determining the Insurance Value of the High Aswan Dam for the Egyptian Economy." International Food Policy Research Institute, Washington, DC.
- Tal, S. 2006. "Sustainability in Water Sector Management in Israel." Presentation by the Israeli Water Commissioner to the World Bank, March.
- Tunisia Ministry of Agriculture and Hydraulic Resources. 2006. Presentation to a Seminar on Integrated Water Resource Management. Rabat, Morocco. January.
- Tunisie MAERH (Ministère de l'Agriculture, de l'Environnement et des Ressources Hydrauliques). 2001. *Etude d'Evaluation technico-économique du programme national d'économie d'eau en irrigation*. Tunis, Tunisia.
- . 2005. *Rapport d'avancement du PISEAU*. Unpublished, Tunis, Tunisia.
- Tynan, N., and W. Kingdom. 2002. "A Water Scorecard." World Bank Viewpoint Note 242, World Bank, Washington, DC.

- UN (United Nations). 2003. *World Urbanization Prospects*. United Nations Secretariat, Department of Economic and Social Affairs, Population Division, New York.
- UNESCO-IHP (United Nations Educational, Scientific and Cultural Organization, International Hydrological Programme). 2005. *Non-Renewable Groundwater Resources: A Guidebook on Socially-Sustainable Management for Water Policy-Makers*. Paris: UNESCO.
- UNESCWA (United Nations Economic and Social Commission for Western Asia). 2001. *A Study on the Evaluation of Environmental Impact Assessment Legislation in Selected ESCWA Countries*. Beirut: ESCWA.
- UNICEF-WHO (United Nations Childrens Fund and World Health Organization) database. http://www.unicef.org/statistics/index_24304.html (accessed April 12, 2006).
- USAID (United States Agency for International Development) and PWA (Palestinian Water Authority). 2003. "West Bank Integrated Water Resources Management Plan." Ramallah, West Bank.
- USDA (United States Department of Agriculture) database. <http://www.ers.usda.gov/db/wto/AMS-database> (accessed March 2006).
- U.S. Energy Information Administration database. <http://tonto.eia.doe.gov/dnav/pet/hist/wtotopecw.htm> (accessed March 21, 2006).
- Water Watch. 2006. "Historic Groundwater Abstractions at National Scale in the Kingdom of Saudi Arabia: An Independent Remote Sensing Investigation." Final Report, Wageningen, the Netherlands.
- Wichelns, D. 2005. "The Virtual Water Metaphor Enhances Policy Discussions Regarding Scarce Resources." *Water International* 30 (4): 428–37.
- Williamson, O. 1979. "Transaction Cost Economics: The Governance of Contractual Relationships." *Journal of Law and Economics* 22 (2): 233–61.
- Wolf, Aaron, ed. 2002. *Conflict Prevention and Resolution in Water Systems*. Cheltenham, UK: Elgar.
- WHO (World Health Organization). 2003. *The World Health Report 2003: Shaping the Future*. Geneva: WHO.

- World Bank. 1994. *A Strategy for Managing Water in the Middle East and North Africa*. Directions in Development, Washington, DC: World Bank.
- . 2000. *Urban Water and Sanitation in the Middle East and North Africa Region: The Way Forward*. Washington, DC: World Bank.
- . 2001. “Egypt: Toward Agricultural Competitiveness in the 21st Century, an Agricultural Export-Oriented Strategy.” Report No. 23405, World Bank, Washington, DC.
- . 2002a. “Arab Republic of Egypt: Cost Assessment of Environmental Degradation.” Report 25175-EGT, World Bank, Washington, DC.
- . 2002b. “Iran, Urban Water and Sanitation Sector Note.” Unpublished draft. Washington, DC.
- . 2003a. *Better Governance for Economic Development in the Middle East and North Africa: Enhancing Inclusiveness and Accountability*. Washington, DC: World Bank.
- . 2003b. “Kingdom of Morocco: Cost Assessment of Environmental Degradation.” Report No. 25992-MOR, World Bank, Washington, DC.
- . 2003c. “Republic of Lebanon: Policy Note on Irrigation Sector Sustainability.” Policy Note No. 28766, World Bank, Washington, DC.
- . 2003d. *Trade, Investment and Development in the Middle East and North Africa: Engaging with the World*. Washington, DC: World Bank.
- . 2004a. Country Policy and Institutional Assessment Database (accessed October, 2005).
- . 2004b. *Country Water Resources Assistance Strategy for the Islamic Republic of Iran*. World Bank, Washington, DC.
- . 2004c. “Kingdom of Morocco Poverty Report: Strengthening Policy by Identifying the Geographic Dimension of Poverty.” Report No. 28223-MOR. Washington, DC: World Bank.
- . 2004d. “Kingdom of Morocco: Recent Economic Developments in Infrastructure.” Report No. 29634-MOR, World Bank, Washington, DC.

- . 2004e. “Kingdom of Saudi Arabia: Assessment of the Current Water Resources Management Situation.” Unpublished manuscript, Rural Development Water and Environment Department, Middle East and North Africa Region, World Bank, Washington, DC.
- . 2004f. *Little Data Book*. Washington, DC: World Bank.
- . 2004g. “Royaume du Maroc. Secteur de l’Eau et de l’Assainissement.” Note de Politique Sectorielle. Report No. 29994-MOR. World Bank, Washington, DC.
- . 2004h. “Syrian Arab Republic. Cost Assessment of Environmental Degradation.” Final Report, World Bank, Washington, DC.
- . 2004i. “Tunisia Country Environmental Analysis.” Report No. 25566, World Bank, Washington, DC.
- . 2004j. “Wastewater Treatment and Reuse in the West Bank and Gaza.” Water, Environment, Social and Rural Development Department Policy Note, World Bank, Washington, DC.
- . 2004k. “République de Djibouti Secteur de l’Eau: Note de Politique Sectorielle.” Report No. 29187-DJ, World Bank, Washington, DC.
- . 2005a. “Arab Republic of Egypt Country Environmental Analysis.” World Bank, Washington, DC.
- . 2005b. “Cost-Effectiveness and Equity in Egypt’s Water Sector. Egypt Public Expenditure Review.” Draft, Rural Development, Water and Environment Department, Middle East and North Africa Region, World Bank, Washington, DC.
- . 2005c. “Framework to Manage Hydrology for Restoring/Maintaining Mesopotamian Marshlands in Iraq.” World Bank, Washington, DC.
- . 2005d. “Gaza Emergency Water Project.” Report No. T7657-WBZ, World Bank, Washington, DC.
- . 2005e. “Islamic Republic of Iran: Cost Assessment of Environmental Degradation.” Report No. 32043-IR, World Bank, Washington, DC.

- . 2005f. “Islamic Republic of Iran: Rural Water Supply and Sanitation Strategy Note.” Unpublished, Rural Development, Water and Environment Department, Middle East North Africa Region, World Bank, Washington, DC.
- . 2005g. “Project Appraisal Document on a Proposed Loan in the Amount of €3.1 million (US\$38.03 million equivalent) to the Société Nationale d’Exploitation et de Distribution des Eaux (national public water supply utility) with the Guarantee of the Republic of Tunisia for an Urban Water Supply Project.” Report No. 33397-TN, World Bank, Washington, DC.
- . 2005h. “Rural Water Supply and Sanitation in the Middle East and North Africa Region.” Advocacy paper, unpublished, World Bank, Washington, DC.
- . 2005i. “Stocktaking of Water Resource Management Issues in Iraq.” World Bank, Washington, DC.
- . 2005j. “Tunisia: Agricultural Sector Review Mission.” Unpublished, Rural Development, Water and Environment Department, World Bank, Washington, DC.
- . 2005k. “Turkey: Policy and Investment Priorities for Agriculture and Rural Development.” Draft, World Bank, Washington, DC.
- . 2005l. “A Water Sector Assessment Report on the Countries of the Cooperation Council of the Arab States of the Gulf.” Report No. 32539-MNA, World Bank, Washington, DC.
- . 2005m. “Republic of Yemen: Country Water Resource Assistance Strategy.” Report No. 31779-YEM. World Bank, Washington, DC.
- . 2005n. World Development Indicators. World Bank, Washington, DC.
- . 2006a. “Financial and Economic Analysis of the Agricultural Sector for the Kingdom of Saudi Arabia: the Water Perspective.” Draft, Rural Development, Environment and Water Department, Middle East and North Africa Region, World Bank, Washington, DC.
- . 2006b. “Implementation Completion Report (TF-22443) on a Trust Fund Credit in the Amount of US\$21 Million to the West Bank

- and Gaza for the Southern Area Water and Sanitation Improvement Project.” Report No: 35859-GZ, World Bank, Washington, DC.
- . 2006c. “Local Action for Groundwater Management.” Prepared for the 4th World Water Forum, Mexico City, March 16–23.
- . 2006d. “Managing Water Resources to Maximize Sustainable Growth: A Country Water Resources Assistance Strategy for Ethiopia.” Report No. 36000-ET, World Bank, Washington, DC.
- . 2006e. *Maroc: Etude des Flux et Mécanismes de Financement du Secteur de l’Eau, Résultats intermédiaires*. Washington, DC: World Bank.
- . 2006f. “Mexico: Assessment of Policy Interventions in the Water Sector.” Volume I: Policy Report. World Bank, Washington, DC.
- . 2006g. “People’s Democratic Republic of Algeria, Making Best Use of the Oil Windfall with High Standards for Public Investment. A Public Expenditure Review.” Report No. 36270–DZ, Draft, World Bank, Washington, DC.
- . 2006h. “Tamil Nadu Irrigated Agriculture Modernization and Water Resources Management Project.” Concept Note, World Bank, Washington, DC.
- . 2006i. “Tunisia: Agricultural Policy Review.” Report No. 35239-TN, World Bank, Washington, DC.
- . Various years. *World Development Indicators* (WDI) database. Washington, DC: World Bank. Available at <http://www.worldbank.org/data>.
- . Prospects for the Global Economy Database. <http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/DEC/INTPROSPECTS/INTGLBPROSPECTSAPRIL/0,,contentMDK:20423496~menuPK:659053~pagePK:64218948~piPK:64218842~theSitePK:659016,00.html> (accessed June 16, 2006).
- World Bank and BNWP (Bank–Netherlands Water Partnership). 2004. “Seawater and Brackish Water Desalination in the Middle East, North Africa, and Central Asia: A Review of Key Issues and Experi-

ence in Six Countries.” Working Paper No. 33515, World Bank, Washington, DC.

World Bank and FAO (UN Food and Agriculture Organization). 2003. “République Algérienne Démocratique et Populaire: Secteur de l’Eau. Eléments d’une Stratégie Sectorielle.” Draft prepared with participation of the Agence Française de Développement, Washington, DC.

WRI (World Resources Institute) Earthtrends Database. “Water Withdrawals: Percent Used for Agricultural Purposes.” http://earth.trends.wri.org/searchable_db/index.php?theme=2 (accessed November 25, 2005).

Yepes, G., K. Rinskog, and S. Sarkar. 2001. “The High Cost of Intermittent Water Service.” *Journal of Indian Waterworks Association* 33 (2): 167–70.

Index

- access, *56n.2*, 101
 - to improved sanitation facilities, 194
 - to improved water, 194
- accountability, 2, 4, 26, 85, 116, 134, 135
- agriculture, 68
- allocation and services, 132–133
- conflict and, 105
- external, 95–113
- government, xxiii–xxiv
- index, 100, 197
- interest groups and, 60
- internal, 99
- problems, 112
- rules and mechanisms, 121–122
- scarcity, 22–23, 24, 51–55
- water sector, 123–134
- water service providers, xxiii–xxiv
- administration, index of quality of, 197–198
- agencies, functions, 22
- agriculture
 - allocations, *112n.1*
 - high-value, 66
 - policy, 122–123
 - support, 86
 - trade, 9–10
 - transformation, 61–69
 - value-added, GDP and, 68
 - water withdrawals, 11–13, 51, 196
- Algeria, 160–161
 - budget, 118
 - costs, 111–112
 - dams and irrigation, 105, 106
 - water organizations, 43, 44
 - water service position, 161
- allocation, 99
 - essential steps, 26
 - flexible, 21, 23, 124–126
 - negotiation, 124–125
- aqueduct, 200–201
- aquifers, ii, 80–81
 - withdrawals, 23
- arbitration, 88
- arid regions, water management, 117
- aridity
 - hyper-aridity, 7–8
 - zoning, 17
- Aswan High Dam (AHD), 36
- availability, 110
- Bahrain, 162–163
 - water service position, 163
- beneficiaries, 120–121
- benefits
 - public vs private, 102–103
 - types, 120
- buyers and sellers, location, 24–25
- canal system, 202–203

- capacity, improvement, 132–134
- capital intensity of investments, 15
- case studies, 199–205
- cereal crops, 62–63
- challenges, new, 15–21
- changes, 115–137
 - indicators, 3–4
- climate change, 75
- common-pool resources, 103
- conflict. *See* disputes
- Conseil des Sages, 200–201
- conveyance systems, 25
- cooperation, 82
 - water as a vehicle for, 83
- costs, 3, 4, 86–87, *93n.15*, 118
 - allocation, 15
 - environmental degradation, 107–112
 - household, 110–111
 - intermittent supply, 111–112
 - operating cost coverage ratio, 197
 - for utilities, 155
 - sources, 156
 - recovery, 16, 19, 101, 119–121
 - social, 123
 - stakeholders and, 104
 - utilities mismanagement, 110–111
 - vended water vs utility water, 111
- Council of Notables, 202–203
- country profiles, 159–198
- crises, 3
- crops
 - returns to water use, 63
 - see also* agriculture
- dams, ii, 34–35
 - capacity, 35
 - as a percentage of renewable resources, 150
- data notes and source, 159
- decentralization, 128
- decision making
 - bodies, 133–134
 - decentralization, 43–44
- deforestation, 74–75
- demographics, 76–77
- dependency ratio, 146, 196
- desalination, 38, 39, 108, 196
- diarrhea, 108–109
- disputes
 - accountability and, 105
 - adjudication, 22–23
 - investments, 36–37
 - resolution, 87–89, 91, 125
 - rules to ensure equity, 89
- Djibouti, 164–165
 - water service position, 165
- domestic water withdrawals, 196
- drainage water, 42–43
 - pollution, 108
- drought, 35–36, 37, 74, 75
- economy, 96
 - changes, 90
 - diversification, policies that restrict, 12
 - economic and finance ministries, 4
 - growth, 12
 - reforms, 55–56
 - sectors, change drivers, 61–73
- education
 - water outcomes and, 78
 - water services professions, 133
- efficiency, 101
 - determinants of, 11–14
 - organizations to improve, 51
- Egypt, 166–167
 - accountability, *93n.11*
 - agricultural drainage, 108
 - agricultural products, 62
 - cooperation, 83

- costs, 118–119
- dams, 36, 47–48
- equitable distribution rules,
 - oases, 89
- organizational capacity, 47–50
- price, 124
- water service position, 167
- water supply, 49
- water user associations, 47
- ejido* sector, 69–70, 92*n.6*
- enforcement, 45
- environment
 - change drivers, 74–76
 - degradation, cost, 109, 118–119
 - shocks and extreme events, 74–75
 - performance, 131
 - protection, NGOs, 53–54
- equity
 - distribution rules, oases, 89
 - organizations to improve, 51
- Ethiopia, water priority, 119
- excess demand, 19
- expenditure, public, 117–119
- export crops, 62–63

- falaj, 202–203
- family level, water and, 106–107
- farmers
 - employment, aggregate measure of support and, 67
 - irrigation management, 53
- financing, organizations to rebalance, 50
- fiscal shocks, 69–73
- floods, 74
- food
 - marketing and markets, 62, 64
 - self-sufficiency, 81
 - supply, 16
- freshwater resources, reservoirs, 34

- fruit and vegetables, 62, 63–64
 - growth rates, 64
- funds, efficient use, determinants of, 14–15

- GDP, 194
 - agricultural value-added and, 68
 - per capita, 194
- GNI, 194
- good practice, 127
- governance, 70, 112*n.2*
 - agriculture, 68
 - gap, 99–100
 - index of quality, 112–113*n.3*, 198
- Great Man-Made River, 36
- groundwater
 - depletion, 21, 77
 - internal, 195
 - overpumping, 19–20
 - usage, 19
 - value of, 21
- growth, average annual, 194

- health
 - damage, 109
 - outcomes, v
 - protection, 92*n.3*
- household costs, 110–111
- hydrological cycles, disrupted, 107
- hyper-aridity, 7–8

- importance, 135
- incentives, 82
 - institutional, 105
- inclusiveness, 60
- index, internationally comparable, 44
- indicators, definitions of, 194–198
- industrial water withdrawals, 196
- informal tribal councils, 91, 202–205

- informal water boards, 200–201
- information, 118
 - access, 78, *93n.12*
 - disclosure, 128–132
 - water outcomes and, 78
- infrastructure, v, 3, 41–42, 120, *137n.1*
 - costs, 118
- institutions
 - accountability and, 105–106
 - responsibility for water management, 129
 - rules, 22
 - social impact of reform, 82–90
- interest groups, 4, 59–60
 - balancing, 104–107
- intermittent supply, 110, 111, *113n.8*
 - costs, 111–112
- internal-groundwater, 195
- internal-surface water, 195
- international issues
 - agreements, 80
 - drivers of change, 80–82
- investments, xxi, 15
 - capital intensity of, 15
- Iran, 168–168
 - agricultural products, 62
 - dams and irrigation, 105, 106
 - rural services, 41–42
 - water service position, 169
- Iraq, marshes and water control, 104–105
- irrigation, ii, 42–43
 - access to, *113n.4*
 - area equipped for, 19, 42
 - fiscal context, 71
 - infrastructure, 19
 - organizations, 47–50
 - ownership, 70
 - perverse incentives, 13
 - rainfall and, 35
 - reforms, 65–66
 - service providers, 66
 - social protection and, 84–85
 - urban water supply and sanitation, 85–87
 - water demand, 124
- Israel, economy and water, 96–98
- Jordan, 179–171
 - demographics, 77
 - groundwater depletion, 76
 - irrigation pricing, 72
 - water service position, 171
 - water supply, 48
- jrida, 200–201
- judicial systems, 25
- Kuwait, 172–173
 - water service position, 173
- labor force, agriculture, 63, 66–67
- land
 - area, 194–195
 - markets, 25
- Lebanon, 174–175
 - costs, 118
 - environmental degradation, 108
 - fiscal factors, 72
 - water organizations, 44
 - water service position, 175
- legislation, 25, 44, 45, 70, 126
- Libya, water distribution, 36
- lobby groups, 3
- losers, 65
- macroeconomic factors, 69–73
- maintenance, v, 3
 - costs, 118
- MENA countries, *xxvii.1*, 1, *30n.1*
 - adaptation, 15–16, 33
- Mexico, *92n.6*
 - accountability, 70
 - legislation, 70

- price, 124
 water policy and fiscal crisis, 69–71, 92*n*.670
- Millennium Development Goals, 40–41
- monitoring systems, 130
- Morocco, 176–177
 agricultural labor, 63
 costs, 118
 crops, 11–12, 13
 dams, 37, 107
 diarrhea, 109
 drought, 35, 37
 exports, 63
 fiscal crisis, 71–72
 irrigation, 65, 71–72, 84–85
 legislation, 126
 rural services, 40
 social protection, 84–85
 water distribution, 36–37
 water organizations, 44
 water service position, 177
 water supply, 48–49, 106–107
 women, 106–107
- mortality rate, under 5, 194
- multipurpose use, 15
- multisectoral nature of water, 135
- need, 8–9
- Nile Basin Initiative, 83
- nonrevenue water ratio for utilities, 52
- nonwater sector factors, 10–20, 116–117
- oases, rules for equitable distribution, 89
- oil and gas prices, 72–73
- Oman, 178–179
 water service position, 179
- operating cost coverage ratio, 197
 for utilities, 87, 155
 sources, 156
- opportunity, xxii–xxiii
- organizational capacity, 43–51
 end-user efficiency and equity, 51
 financing, 50
 scarcity of, 22, 23, 24
 water transactions, 25
- ownership, irrigation, 70
- performance indicators, 110
- planning, 133, 134
- policies, xxii, 27, 100, 115–116, 134, 136
 agricultural, 65
 categories, 3
 choices, 103–104
 consequences, 20
 data availability and, 130
 evaluation, 45
 nonwater, vii, 11, 117–123
 objectives and responses, 117
 options, water and, 122–123
 proposals, 134
 reforms, 3, 90
 trade reform and, 69
- politics and political economy, xxii, 90, 92, 136
 accountability and, 59
 changes, 27–28
 decision-making model, 28
 driving factors, 28–29, 59–94
 nonwater policy and, 117–123
 reforms and, vii, 2, 3–4, 26–29
 trade-offs, 134–135
- pollution, 107–108
- population, 10, 16, 17, 76
 trends, urban and rural, 151
- practices, traditional, cultural, and official, 103
- precipitation, 5–6, 17
 average, 195
- prices, water, 25–26, 124
 supports, 12, 27

- private sector, 127–128
- problem, xvii–xxii
- property rights for water, 25
 - see also* water rights
- public sector, ii, 16
 - expenditure, 137
 - health, and environmental quality, 108
 - information disclosure, 54–55, 131–132
 - spending, v, 14–15, 118–119, 119–121, 137
 - water vs GDP, 14
- qanat, 91, 200–201
- Qatar, 180–181
 - water service position, 181
- quality
 - index of quality of administration, 197–198
 - index of quality of governance, 198
- rainfall, 5–6, 35
- reform, xxi–xxii, 90, 136
 - beneficiaries, v, 3
 - needed, 2–3
 - political economy, xxiii, 2, 26–29
 - pressure for, indicators, 3–4
- rent-seeking strategies, 66
- report structure, 29–30
- reservoirs, xix, 34
 - water stored as a percentage of renewable resources, 149
- resource management, external 101
- results, xxi
- reused water, 196
- river, withdrawals, 23
- roles and responsibilities, 126–128
- rules of use, 2
- rural population, 194
 - trends, 151
- rural services, 40–42
- sadya, 91, 200–201
- sanitation. *See* water supply and sanitation
- Saudi Arabia, 182–183
 - crops, 12
 - desalination, 38
 - water service position, 183
- scale-up, xxiv
- scarcity, 31*n.8*
 - quantification, 8–9
 - types, 21–26
- school enrollment, 106–107
- sedimentary patterns, 107
- service
 - delivery, 127–128
 - on-demand system, 21
 - outages, xxi
 - providers, 137*n.1*
 - quality, 102, 127
- shadow price, 25
- social factors
 - change drivers, 76–80
 - changes, xxii–xxiii
 - costs, 123
 - irrigation, 84–85
 - preferences, 10
 - priorities, water lobbies and, 79
 - protection, 84–87, 92
- Spain
 - social priorities and water lobbies, 79
 - water management system, 96, 97
- spending, public, v, 14–15, 118–119, 119–121, 137
- stakeholders
 - costs and, 104
 - data, 130–131
 - input, 95
 - involvement, 53, 121

- steps forward, xxiii–xxiv
- subsidies, 13–14, 16, 44–45, 84, 87, 118
- supplemental water, 196
- Syria, 184–185
- crops, 13
 - data to stimulate change in water utilities, 130
 - water service position, 185
- technology, 88
- strategies and planning documents, 134
 - supply augmentation, 38–40
- tourism, 61
- trade
- facilitation, 89–90
 - liberalization, 65
 - reform, 11
- “tragedy of the commons,” 19
- transboundary water, 8, 80–82
- transparency, 15, 22, 54–55, 60
- trends, 4
- nonwater sector, 2
- tribal councils, informal, 91, 202–205
- Tunisia, 186–187
- agricultural products, 62
 - agricultural support, 86
 - irrigation and fiscal crisis, 70–71
 - water organizations, 44
 - water saving program, 51
 - water service position, 187
 - water supply, 48
- Uganda
- accountability mechanisms, 122
 - objectives, 121
- uncertainty, 103
- United Arab Emirates, 188–189
- water service position, 189
- United States
- economy and water, 96
 - social priorities and water lobbies, 79
- urban population, 194
- trends, 151
- urban water supply and sanitation, 71–72
- consumers, 118
 - efficiency, 51
 - populations, 66
 - rural vs, 18, 27
- urbanization, 76
- usage, vii, 11–14
- user empowerment and decentralization, 78–79
- utilities, 101
- mismanagement and cost, 110–111
 - operating cost coverage ratio, 155
- valuation, 25–26
- variability, 7
- virtual water imports, crops, livestock, total, 196
- waste, 12
- wastewater
- generation, 108
 - treatment and reuse, 38–40, 56*n.1*
- water boards, informal, 200–201
- water management, xxiv, 1, 2, 30*n.3*, 136
- adaptation, xvii–xviii
 - institutions and policies, 4–10
 - integrated, 20
 - second-generation, 16, 19
 - transformation, 96
- water ratio for utilities, nonrevenue, 156
- sources for, 157

- water resources
 - accountability, external, 102–112
 - allocation, xxi
 - availability, 6, 8
 - available by source, 144
 - available or used by source, 144
 - cash flow, 46
 - cost recovery, energy production and, 74
 - data, 139–149
 - diversions, 107
 - imports, virtual, for crops, livestock, and total, 196
 - international agreements, 80
 - markets, 25, *3In.10*
 - unregulated, 125–126
 - nonrevenue, 197
 - organizations, 43–46, *92n.7*, 99–102
 - evaluation, 45
 - per capita, 5, 7
 - percentage available by source, 143
 - physical scarcity, 21, 23, 24, 33–43
 - planning, 132–134
 - quality, concern for, 78
 - requirement ratio, *113n.5*, 154, 197
 - saving programs, 51
 - scarcity, 197
 - self-sufficiency, 197
 - services, 101
 - access to, percentage, 153
 - data, 153–157
 - shortage, xvii
 - source, 8, *56n.2*
 - storage, 16, 34–35
 - households, 111
 - total exploitable, 195–196
 - usage, 8, 59, 69
 - values, 25
 - volume available by source, 143
 - withdrawal
 - agricultural, 196
 - domestic, 196
 - industrial, 196
 - as a percentage of total
 - renewable resources, 145
 - by sector, 147–146
 - total, 196
- water resources, nonrevenue
 - available or used by source, 144
 - data, 139–149
 - percentage available by source, 143
 - total withdrawal as a percentage of total renewable resources, 145
 - volume available by source, 143
 - water ratio for utilities, 156
 - sources for, 157
- water resources, renewable, xviii, xx, 4, 5, 7, 18
 - dam capacity as a percentage of, 150
 - external, 195
 - per capita, 139
 - reservoir storage as a percentage of, 149
 - total
 - internal and external, 195
 - per capita by country, 142
 - withdrawal, 140
 - per capita, 141
 - percentage of total, 140
 - by sector, 147–146
- water rights, 26, 70, 124
 - reallocation and, 125
 - requirements, 24–25
 - tradable, 23–24
- water sector, xviii, xx, *xxvii.2*, *30n.4*, 136
 - fragmentation, 3
 - progression vs results, xx–xxi

- water supply and sanitation, 16,
 - 19, 34–38, 40–42, 122
 - access to, xviii, xix, 56*n*.2, 194
 - coverage, 31*n*.7
 - fiscal context, 71
 - organizations, 46
 - subsidized, 16
 - urban, social protection and,
 - 85–87
- Water User Associations, 47
- water wheel, 200–201
- wells. *See* aquifers
- West Bank and Gaza, 192–193
- winners, 65
- women
 - water outcomes and, 78
 - water supply, 106–107
- Yemen, 190–191
 - demographic changes, 77
 - disputes, 20
 - groundwater depletion, 76
 - water control, 105
 - water market, 126
 - water service position, 191
 - water user associations, 47

ECO-AUDIT

Environmental Benefits Statement

The World Bank is committed to preserving endangered forests and natural resources. The Office of the Publisher has chosen to print *Making the Most of Scarcity* on 50% recycled paper including 25% post-consumer recycled fiber in accordance with the recommended standards for paper usage set by the Green Press Initiative, a nonprofit program supporting publishers in using fiber that is not sourced from endangered forests. For more information, visit www.greenpressinitiative.org.

Saved:

- 22 trees
- 1,330 lbs. of solid waste
- 8,041 gallons of water
- 2,453 lbs. of net greenhouse gases
- 15 million BTUs of total energy

