



**UvA-DARE (Digital Academic Repository)**

**To cooperate or not to cooperate...? : collective action for rehabilitation of traditional water tunnel systems (qanats) in Syria**

Wessels, J.I.

[Link to publication](#)

*Citation for published version (APA):*

Wessels, J. I. (2008). To cooperate or not to cooperate...? : collective action for rehabilitation of traditional water tunnel systems (qanats) in Syria Amsterdam: Vossiuspers

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <http://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

## References

Abel, T. and J. R. Stepp (2003) A new ecosystems ecology for anthropology. *Conservation Ecology* 7(3): 12. [online] URL: <http://www.consecol.org/vol7/iss3/art12/>

Abraham, A. & Platteau, J.P. (2000) The central dilemma of decentralised rural development, working paper, Centre for Research on Economic Development (CRED) Department of Economics, Belgium: University of Namur.

Abraham, A. & Platteau, J.P. (2004) Participatory Development; where culture creeps in. *in* Rao, V. & Walton, M. (eds.) *Culture and Public Action*. Washington D.C.: World Bank.

ACSAD (1984) *Water resources map of the Arab countries*. Damascus: The Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD).

Adano, W. R. and Witsenburg, K. (2004) *Surviving Pastoral Decline: Pastoral sedentarization, natural resource management and livelihood diversification in Marsabit District, Northern Kenya*. PhD. Thesis, University of Amsterdam.

Adeel, Z. (2005) *Ecosystems and human well-being: desertification synthesis*. Washington D.C.: World Resources Institute.

Adhikari, B. (2002) Property rights and natural resource: socio-economic heterogeneity and distributional implications of common property resource management in Nepal, A Discussion Paper Prepared for the Beijer Institute Advanced Workshop on Property Rights Structures and Environmental Resource Management Durban, 8-30 May 2002, South Africa.

Adhikari, B. and Lovett, J. (2006) Institutions and collective action: does heterogeneity matter in community-based resource management? *The Journal of Development Studies*, 42(03), pp. 426 – 445.

Agrawal, A. (2002) Common Resources and Institutional sustainability *in* Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) *The Drama of the Commons*. USA: National Academy Press, pp. 41-87.

Allan, J A (2001) Virtual Water – Economically Invisible and Politically Silent – A Way to Solve Strategic Water Problems. *International Water & Irrigation*, 21(4), pp. 39-41.

Allan, J.A. (2002) *The Middle East Water Question, hydropolitics and the global economy*. London: Tauris.

Amaral, L.A.N. and Ottino, J.N. (2004) Complex networks: Completing the framework for the study of complex systems. *European Physics Journal*, 38, pp. 47-162.

Apollin, F. (2002) Re-negotiating of water rights in the ancient irrigation system of Urcuqui, Ecuador in Boelens, R. & Hoogendam, P. (2002) *Water rights and Empowerment*. The Netherlands: Koninklijke van Gorcum.

Appelo C A J. & Postma D (1993) *Geochemistry, groundwater and pollution*. Rotterdam: A.A. Balkema.

Ashram, M. (1990) Agricultural labour and Technological Change in the Syrian Arab Republic, in *Labor and Rainfed Agriculture in West Asia and North Africa*. The Netherlands: Kluwer Publishers.

Aw-Hassan, A. (2002) Understanding Poverty and Development Options in Dry Areas: The Khanasser Valley Integrated Research Site in Syria in Caravan Issue 17 December 2002. Aleppo: ICARDA.

Aw-Hassan, A., La Rovere, R., Mazid, A. (2004) Can Agricultural Research Impact on the Poor? Evidence from Dry Marginal Areas in Syria and Yemen in Peters, K., Kirschke, D., Manig, W. Bürkert, A., Schultze-Kraft, R., Bharati, L., Bonte-Friedheim, C., Deininger, D., Bhandari, N., Weitkamp, H. (eds.) *Rural Poverty Reduction through Research for Development and Transformation, Deutscher Tropentag, October 5 - 7, 2004*. Germany: Köthen GmbH.

Baland & Platteau (1999) The ambiguous impact of inequality on local resource management. *World Development*, (27), pp. 773-788.

Bandaragoda, D.J. (1998) Community-based institutions for local management of water resources; results from initial efforts in Pakistan, World Bank/WBI's CBNRM Initiative.[online] URL: <http://srdis.ciesin.org/cases/pakistan-004.html>

- Barbash, I. & Taylor, L. (1997) *Cross-cultural filmmaking*. USA: University of California Press.
- Bardhan, P. & Dayton-Johnson, J. (2002) Unequal irrigators: heterogeneity and commons management in large scale multivariate research in Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) *The Drama of the Commons*. USA: National Academy Press, pp. 87-113.
- Batatu, H., (1999) *Syria's peasantry, the descendants of its lesser rural notables and their politics*. USA: Princeton Press.
- Bazza, M. & Najib, R. (2003) Towards improved water demand management in agriculture in the Syrian Arab Republic in First International Symposium on Management and Rationalization of Water Resources Use in Agriculture, University of Damascus. Syria: FAO.
- Beaumont, P. (1968) Qanats on the Varamin Plain, Iran. *Transaction of the Institute of British geographers*, 45, pp.169-179.
- Beaumont, P. (1971) Qanats systems in Iran. *Bulletin of the International Association of Scientific Hydrology*, 16, pp.35-43.
- Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) (1989) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press ltd.
- Beaumont, P. (1993) *Drylands, environmental management and development*. London: Routledge.
- Beccar, L., Boelens, R. and Hoogendam, P. (2002) Water rights and collective action in community irrigation in Boelens, R. & Hoogendam, P. (eds.) *Water rights and Empowerment*. The Netherlands: Koninklijke van Gorcum, pp.1-22.
- Birks, J.S. (1984) The falaj: modern problems and some possible solutions. *Water Lines*, 2(4), pp. 28-31.
- Birks, J.S. and Sinclair, C.A. (1980) *International migration and development in the Arab Region*. Geneva: UNFPA/ILO.
- Biswas, A. K. (1994) *International waters of the Middle East, from Euphrates-Tigris to Nile*. UK: Oxford University Press.

Blanche, E. (2001) Mid-East Water Crisis: Time Is Running Out. *The Middle East*, April 2001.

Bloom, J. and Blair, S. (2000) *Islam: Empire of Faith*. London: BBC Worldwide Ltd.

Boelens, R. (2003) Local rights and legal recognition: the struggle for indigenous water rights and the cultural politics of participation. paper presented at the Third World Water Forum, Kyoto, Japan.

Boelens, R. and Hoogendam, P. (eds.) (2002) *Water rights and empowerment*. Koninklijke van Gorcum: Netherlands.

Boelens, R. , Roth, D. and Zwarteveen, M. (2002) *Legal pluralism and unofficial law in social, economic and political development*. Nepal: International Centre for the Study of Nature, Environment and Culture.

Boeren, A. (1994) *In Other Words.....the cultural dimension of communication for development, CESO Paperback no.19*. The Hague: Center for the Study of Education in Developing Countries.

Bonine, M. (1989) Qanats, field systems, and morphology: rectangularity on the Iranian Plateau in Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press ltd.

Bonine, M. (1996) Qanats and Rural Societies, sustainable agriculture and irrigation cultures in contemporary Iran in Mabry, J.B. (ed.) *Canals and Communities*. Tucson: University of Arizona Press, pp. 183-209.

Bonte, P. and Conte, E. (1991) La tribu arabe: approches anthropologiques et orientalistes. in Bonte, P., Conte, E., Hames, C., Ould Cheikh Al-Ansab, A.W. (eds.) *La quete des origines*. Paris: Editions de la Maison des Sciences de l'Homme.

Borrini-Feyerabend, G. (2000) *Co-management of natural resources, organising, negotiating and Learning-By-Doing*. Germany: IUCN/GTZ.

Briant, P. (2001) Irrigation et drainage dans l'Antiquité, qanats et canalisation souterraine en Iran, en Égypte et en Grèce, séminaire tenue

au Collège de France sous la direction de Pierre Briant. France: Thotm editions.

Brydon-Miller, M. (2002) What is Participatory Action Research and What's a Nice Person Like Me Doing in a Field Like This? Paper presentation SPSSI Convention June 28-30, Toronto, Canada.

Bulloch, J. and Darwish, A. (1993) *Coming conflicts, Water Wars in the Middle East*. St UK: Edmundsbury Press.

Burke, E. (2004) *Collective Action and Discursive Shifts: A Comparative Historical Perspective*. no. 1022 Center for Global, International and Regional Studies, Working Paper Series. USA: UC Santa Cruz.

Caponera, D.A. (1973) *Water laws in Moslem countries*. FAO Irrigation and drainage paper. Rome: FAO.

Carney, D. (ed.) (1998) *Sustainable rural Livelihoods, what contribution can we make ?* UK: Department for International Development (DFID).

Casagrande, D. (1999) Information as verb: re-conceptualising information for cognitive and ecological models. *Georgia Journal of Ecological Anthropology*, 3(1999), pp. 4-13.

Case, Karl E. and Fair, Ray C. (1999) *Principles of Economics* (5th ed.) USA: Prentice-Hall.

Chambers, R. (1983) *Rural development; putting the last first*. UK: Harlow/Longman.

Chambers, R. (1998) Us and them: finding a new paradigm for professionals in sustainable development in Warburton, D. (ed.) *Community & sustainable development, participation in the future*. UK: Earthscan.

Chambers, R. (2005) *Ideas for development*. UK: Earthscan.

Clay, J. (2003) Interview with anthropologist Mary Douglas. [online] URL:<http://www.bhag.net/2001/2001douglas/pdouglas1.html>

Cleaver, F. (2001) Institutions, agency and the limitations of participatory approaches to development in Cooke, B. and U. Kothari (eds.) *Participation; the New Tyranny?* London: Zed Books, pp. 36-55.

Coleman, J. (1990) *Foundations of Social Theory*. USA: Harvard University.

Cook, B. & Kothari, U. (2001) *Participation, the New Tyranny?* London: Zed Books.

Cotillon, J. (1993) *Water from Dams in Syria*. Paris: ICOLD.

DFID (2002) *Scaling-up and communication: Guidelines for enhancing the developmental impact of natural resources systems research*. UK: DFID–Natural Resources Systems Programme (DFID–NRSP).

Dietz, T. (1996) Entitlements to natural resources; countours of political environmental geography. Inaugural speech University of Amsterdam: International Books.

Dietz, Th., Dolsak, N., Ostrom, E. and Stern, P. (2002) The drama of the commons. in Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) *The Drama of the Commons*. USA: National Academy Press, pp. 1-33.

Douglas, M. (2002) Traditional Culture, let's hear no more about it. in Rao, V. & Walton, M., (eds.) *Culture and Public Action*, USA: World Bank.

Douwes, D. (2000) *The Ottomans in Syria, a history of justice and oppression*. USA: I.B. Tauris Ltd.

Ehlers, E. and Saidi, A. (1989) Qanats and pumped wells – the case of Assad'abad, Hamadan in Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press ltd, pp. 89-113.

Eickelman, D.F (1989) *The Middle-East, an anthropological approach*. UK: Prentice Hall.

Elhadj, E. (2004) *The Domestic Water Crisis in Syria's Greater Damascus Region, Occasional Paper no. 47, Water Issues Study Group*. London: School of Oriental Studies (SOAS)/King's College University of London.

Ellerman, D. (2005) *Helping people, help themselves, from the World Bank to an Alternative Philosophy of Development Assistance*. USA: University of Michigan Press.

Engelman, R. & LeRoy, P. (1993) *Sustaining Water: Population and the Future of Renewable Water Supplies*. Population and Environment Program: Population Action International

English, P.W. (1968) The origin and spread of qanats in the Old World in *Proceedings of the American Philosophical Society*, 112, pp. 170-181.

English, P.W. (1998) Qanats and lifeworlds in Iranian plateau villages in Bernhardsson, M. *Transformation of Middle Eastern Natural Environments, Legacies and Lessons*, Bulletin 10, USA: New Haven.

Etzioni, A. (1998) A communitarian perspective on sustainable communities in Warburton, D. (ed.) *Community & sustainable development, participation in the future*. UK: Earthscan.

Escobar, A. (1996) Constructing nature: Elements for a poststructuralist political ecology in R. Peet and M. Watt, (eds.) *Liberation Ecologies*. London: Routledge.

Feek W. and Morris, C. (2003) *Communication and Natural Resource Management*. The Communication Initiative/Communication for Development Group. Rome: FAO.

Fiorillo, C. and Vercuei, J. (eds.) (2003) *Syrian agriculture at the crossroad, FAO Agricultural Policy and Economic Development Series No. 8*. Rome: FAO.

Gambill, G.C. (2001) Syrian Workers in Lebanon: The Other Occupation. *Middle East Intelligence Bulletin*, 3(2), [online] URL: [http://www.meib.org/articles/0102\\_11.htm](http://www.meib.org/articles/0102_11.htm)

Geertz, H. (1979) The Meaning of Family Ties in Geertz, C., Geertz, H. and Rosen, L., *Meaning and Order in Moroccan Society: Three Essays in Cultural Analysis*. Cambridge: Cambridge University Press.

George, A. (2003) *Syria, Neither Bread nor Freedom*. London: Zed Books.



Geyer, B. (1990) Techniques et pratiques hydro-agricoles traditionnelles en domaine irrigue, approche pluridisciplinaire des modes de culture avant la motorisation en Syrie. *Actes du Colloques de Damas 27 juin-1er juillet 1987, Tome 1*. Paris: Librairie Orientaliste Paul Geuthner.

Geyer, B. (1990) Techniques et pratiques hydro-agricoles traditionnelles en domaine irrigue, approche pluridisciplinaire des modes de culture avant la motorisation en Syrie. *Actes du colloques de Damas 27 juin-1er juillet 1987, Tome 2*. Paris: Librairie Orientaliste Paul Geuthner.

Gillinson, S. (2004) Why Cooperate ? A Multi-Disciplinary Study of Collective Action, Working Paper 234, London: ODI.

Gladwell, M. (2000) *The Tipping Point, How little things can make a big difference*. UK: Abacus.

Gluckman, M. (1955) *The Judicial Process among the Barotse of Northern Rhodesia*. UK: Manchester University Press.

Gluckman, M. (1963) Papers in Honor of Melville J. Herskovits: Gossip and Scandal. *Current Anthropology*. 4(3), pp.307-316.

Goblot, H. (1979) *Les Qanats, une technique d'acquisition de L'Eau, ecole des hautes etudes en sciences sociales centre de recherches historiques*. Paris: Mouton Editeur EHESS.

Gray, I. (1992) Power Relations in Rural Communities: Implications for Environmental Management in Lawrence, G., Vanclay, F. and Furze, B. (eds.) *Agriculture, Environment and Society*. Australia: Macmillan.

Gray, I, Williams, R and Phillips, E. (2005) Rural community and leadership in the management of natural resources: Tensions between theory and policy. *Journal of Environmental Policy & Planning*, 7:(2), pp. 125-139.

Grimshaw, A. (2001) *The Ethnographer's Eye, ways of seeing in Modern Anthropology*. UK: Cambridge University Press.

Gyawali, D. (1998) Patna, Delhi and environmental activism: institutional forces behind water conflict. *Bihar Water Nepal*, 6(1), pp. 67-115.

Haasse, C.P. (1983) *Ein archäologischer Survey im Gabal Sbet und im Gabal al-Ahass, Damascus Mitteilungen I*. Damascus: Ghoete Institute.

Hakimian, H. (2003) *Water Scarcity and Food Imports: An Empirical Investigation of the 'Virtual Water' Hypothesis in the MENA Region*. London: Cass Business School, City University.

Hamidé, A. (1959) *La Region d'Alep, Etude géographie rurale*. Paris: Université de Paris.

Hamdy, A. (2001) Water Resources Management in the Mediterranean countries: priority actions. *MEDIT*, 2(01), pp. 24-29.

Heemskerk, M. , Wilson, K. and Pavao-Zuckerman, M. (2003) Conceptual models as tools for communication across disciplines. *Conservation Ecology*, 7(3): pp. 8. [online] URL: <http://www.consecol.org/vol7/iss3/art8>

Heider, K. (1976) *Ethnographic Film*. USA: University of Texas.

Hermosilla, J. Fernandez, M., Garcia, E., Cueva, A. and Aguilar, J.A. (2006) *Las Galerías drenantes del sureste de la península Ibérica*. Spain: ESTEPA, University of Valencia.

Hitti, Philip K. (1959) *Syria, a Short History: Being a Condensation of the Author's "History of Syria, Including Lebanon and Palestine"*. New York: Macmillan & Co.

Honari, M. (1989) Qanats and Human Ecosystems in Iran in Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press ltd, pp. 61-87.

Hoogesteger, J. and Vincent, L. (2006) Institutional Change and Farmer Participation in the Abshar Irrigation System, Iran in Proceedings CERES Summerschool 2006. Amsterdam: CERES.

Hoogeveen, R. M. Zöbisch and A. Bruggeman.(1999). Groundwater Balance of the Khanasser Valley, Syria. Paper presented at the International Conference, Water Resources Management, Use and Policy in Dry Areas, 1-3 December 1999, Amman, Jordan.

Hoogeveen, R.J.A. and M. Zöbisch. (1999). Decline of groundwater quality in the Khanasser Valley (Syria) due to salt-water intrusion. Paper presented

at the 6<sup>th</sup> International Conference on the Development of Drylands, Cairo, Egypt, 22-27 August 1999.

Hoogeveen R J A and Zöbisch M (1999) *Well inventory and groundwater in the Khanasser Valley, Syria. Report on a field study in northwestern Syria*. Research report [unpublished] Aleppo: International Center for Agricultural Research in the Dry Areas (ICARDA).

Hopkins, N.N. (1997) *Arab Society*. Cairo: AUC.

Hunt, C. (2004) *Thirsty planet, strategies for sustainable water management*. London: Zed Books.

Ingold, T. (1994) *Companion Encyclopaedia of Anthropology, Humanity, Culture and Social life*. USA: Routledge.

Kabour, Y. (1992) Planning and management of water resources in Syria in Le Moigne *et al. Country Experiences with Water Resources Management, Economic, Institutional, Technological and Environmental Issues*, Technical Paper no. 175. Washington D.C.: The World Bank.

Kadekodi, G.K., Hegde, S.S. (2002) A brief bibliographical survey on common property resources and community management of natural resources. India: Centre for Multi-Disciplinary Development Research.

Katon, B. , Knox, A. and Meinzen-Dick, R. (2001) Collective Action, property rights and devolution of NRM. CAPRI, Policy Brief (2). USA: IFPRI.

Khalaf, S. (1993) *Shaykhs, Peasants and Party Comrades: Political Change in Northern Syria*. Paris: PUF.

Kloos, P. (1991) *Culturele Antropologie, een inleiding*. Assen: Van Gorcum.

Kobori, I. (1969) Le Systeme d'irrigation dans le sahara Central-Tidikelt. *Bulletin of the Department of Geography, University of Tokyo*. 1, pp. 1-32.

Kobori, I. (1973) Some notes on diffusion of qanat. *Orient*. (9), pp. 43-66

Kobori, I. (1976) Notes on Foggara in the Algerian Sahara. *Bulletin of the Department of Geography, University of Tokyo*. 8, pp. 41-55.

Kobori, I. *et al.* (1980) Qanawat Romani of Taibe Oasis, Tokyo University Scientific Mission for the Comparative Study of the Foggara Oasis in the Arid Zone of the Old Continent, Report no. 1. Japan: University of Tokyo.

Kobori, I. *et al.* (1982) Case studies of foggara oases in the Algerian Sahara and Syria, Tokyo University Scientific Mission for the Comparative Study of the Foggara Oasis in the Arid Zone of the Old Continent, Report no. 2. Japan: University of Tokyo.

Kobori, I. (1989) Comparative studies on the formation of Qanat water system. *Bulletin of the Institute of Social Sciences*, 12(1), Meiji University.

Kobori, I. (1990). Les qanat en Syrie. in Geyer, B. (Ed.) *Techniques et Pratiques Hydro-Agricoles Traditionnelles en Domaine Irrigue, Tome 2*. Paris: Librairie Orientaliste Paul Geuthner, pp. 321-328.

Kurian, M. (2003) *From project to process, participatory watershed management in the Himalayan foothills*. PhD Thesis, The Hague: Institute of Social Studies.

Kurian, M. & Dietz, T. (2004) Irrigation and collective action: a study in method with reference to the Shiwalik Hills, Haryana. *Natural Resources Forum*, (28), pp.34-49.

Lambton, A.K.S. (1989) The origin, diffusion and functioning of the qanat in Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press ltd, pp. 5-13.

Lammerink, M.P. *et al.* (1998) Participatory action research on community management of water resources in six countries from the South, World Bank/WBI's CBNRM Initiative [online] URL: <http://srdis.ciesin.org/cases/pakistan-004.html>

Landis, J. (2004) The United States and Reform in Syria [unpublished article] University of Oklahoma [online] URL: [http://www.ou.edu/ssa/US\\_Syrian\\_Reform.htm](http://www.ou.edu/ssa/US_Syrian_Reform.htm)

La Rovere, R. and Aw-Hassan, A. (2005) Ex-ante assessment of agricultural technologies in marginal dry areas: The Khanasser Valley

case, Syria. Integrated Natural Resource Management Technical Research Report Series 6. Aleppo: ICARDA.

La Rovere, R. Turkelboom, F., Aw-Hassan, A., Bruggeman, A., Thomas, R. (2005) Pathways out of rural poverty in marginal areas: The Role of 'INRM technologies' in a dry sub-region of Syria *in* Development Strategies, Pathways and Synergies, GLO, 2005.

La Rovere, R., Aw-Hassan, A., Turkelboom, F., Thomas, R. (2006) Targeting Research for Poverty Reduction in Marginal Areas of Rural Syria. *Development and Change*, **37**(3), pp. 627–648.

Lassoe, J. (1953) Reflections on modern and ancient waterworks. *Journal of Cuneiform Studies*, VII, 1953.

Leach, M., Mearns, R. and Scoones, I. (1999) Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development*, **27**(2), pp. 225-247.

Le Moigne *et al.* (1992) Country Experiences with Water Resources Management, Economic, Institutional, Technological and Environmental Issues, Technical Paper no. 175. Washington D.C.: The World Bank.

Leonard, W.R. and Crawford, M.H. (2002) *Human biology of pastoral populations*. UK: Cambridge University Press.

Lewis, N. (1987) *Nomads and settlers in Syria and Jordan 1800-1980*. UK: Cambridge University Press.

Lewis, N. (2000) Travellers at Tayyibah: the northern desert of Syria, 1600-1980 *in* Starkey, J. and al Daly, O., (eds.) *Desert Travellers from Herodotus to T.E. Lawrence*. UK: ASTENE, University of Durham.

Lightfoot, D.R. (1996) Syrian qanat Romani: History, Ecology, Abandonment. *Journal of Arid Environments*, (33), pp. 321-336

Lightfoot, D.R. (1997) Qanats in the Levant: Hydraulic Technology at the Periphery of Early Empires. *Technology and Culture*, **38**(2), pp. 432-451.

Lightfoot, D.R. (2000) The origin and diffusion of qanats in Arabia: new evidence from the Northern and Southern Peninsula. *The Geographical Journal*, 166.

Lightfoot, D. (2003) Traditional wells as phreatic barometers: a view from qanats and tube wells in developing arid lands. Proceedings of the UCOWR Conference: Water Security in the 21<sup>st</sup> Century, Washington D.C., USA.

Little, Peter D. (1994) The link between local participation and improved conservation: A review of issues and experiences in Western, D. and Wright, R.M. (eds.) *Natural Connections: Perspectives in Community-Based Conservation*. Washington D.C.: Island Press, pp. 347-372.

Lonergan, S. (1996) Water Resources and Conflicts: Examples from the Middle East, paper presented in the NATO Advanced Research Workshop, Bolkesjo, Norway.

Lovelock, J. (2007) *The Revenge of Gaia, why the Earth is fighting back - and how we can still save humanity*. UK: Penguin Books.

Lunch, C. and Lunch, N. (2006) *Insights into participatory video, a handbook for the field*. UK: Insight Publications.

Mabry, J.B. (ed.) (1996) *Canals and Communities*. Tucson: University of Arizona Press.

Majoor, S. (2003) New norms for Multiple Intensive Land-Use, paper presented at 39<sup>th</sup> IsoCaRP Congress 2003, The Netherlands.

Mansuri, G. and Rao, V. (2003) *Evaluating Community-Based and Community-Driven Development, A Critical Review of the Evidence*. USA: Development Research Group, The World Bank.

Marshall, G.R. (2003) *From words to deeds; a study of collective action by irrigators in enforcing their commitments to adopt conservation practices*. Australia: Centre for Environmental Solutions, Duke University.

Marten, G. (2003) *Human Ecology, Basic Concepts for Sustainable Development*. UK: Earthscan.

Martin, A. and Sherington, J. (1997) Participatory Research Methods – implementation, effectiveness and institutional context. *Agricultural Systems*, 55, pp. 195-216.

Masters, J. (1995) The History of Action Research in Hughes, I. (ed.) *Action Research Electronic Reader*. The University of Sydney [on-line] URL: <http://www.behs.cchs.usyd.edu.au/arow/Reader/rmasters.htm>

Ma'oz, M. (1968) *Ottoman Reform in Syria and Palestine 1840-1861*. Oxford: Clarendon Press.

McCay, B. (2002) Emergence of institutions for the commons: contexts, situations and events in Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) *The Drama of the Commons*. USA: National Academy Press, pp. 361-403.

McNetting, R. (1974) Agrarian Ecology. *Annual review of Anthropology*, 3(21).

Meinzen-Dick, R. (1984) *Local management of tank irrigation in South-India: organization and operation*, Cornell Studies in Irrigation. No. 3. USA: Cornell University.

Meinzen-Dick, R. et al (eds.) (2002) *Innovation in Natural Resource Management, the role of property rights and collective action in developing countries*. USA: IFPRI.

Metral, J. et al (1981) *L'homme et L'eau en Mediterranee et au Proche Orient I*. GIS-Maison de L'Orient. France: Presse Universitaire de Lyon.

Metral, J. (1982) Le droit de l'eau dans le code civil Ottoman de 1869 et la notion de domaine public in Metral, J. et al (eds.) *L'homme et L'eau en Mediterranee et au Proche Orient II*. GIS-Maison de L'Orient. France: Presse Universitaire de Lyon.

Metral, J. et al (1987) *L'homme et L'eau en Mediterranee et au Proche Orient IV*. GIS-Maison de L'Orient. France: Presse Universitaire de Lyon.

Mikkelsen, B. (1995) *Methods for Development Work and Research, a guide for practitioners*. USA: Sage publications.

Min-Dong, P. L. (2002) Community-Based Natural Resource Management, a bird's eye view [internship report] Canada: IDRC.

Molle, F., Shah, T. and Barker, R. (2003) The groundswell of pumps: multilevel impacts of a silent revolution, paper presented at the ICID-Asia Meeting, Taiwan.

Molle, F., Mamanpoush, A. and Miranzadeh (2004) *Robbing Yadullah's water to irrigate Saeid's garden: hydrology and water rights in a village in Central Iran*. IWMI Research Report 80. Colombo, Sri Lanka: International Water Management Institute.

Mollinga, P. (2001) Water and politics, levels, rational choice and South Indian canal irrigation. *Futures*, 33(8), pp. 733-752.

Mollinga, P. *et al* (2004) Water, Politics and Development, Strengthening German social science input into global change research on water resources management, Concept Note 1 December 2004. Germany: ZEF University of Bonn [online] URL: <http://131.220.109.9/659.0.html>

Moore, S.F. (1987) *Explaining the Present: Theoretical Dilemmas in Processual Ethnography*. USA: NY University Press.

Moriarty, P., Batchelor, C., Abd-Alhadi, F. and Laban, P. (2007) *Guidelines for Improved Local Water Governance*. Amman: EMPOWERS, EU MEDA-Water Programme.

Mouterde, R. and Poidebard, A. (1945) *Le limes de Chalcis, organisation de la steppe en haute Syrie Romaine*. Paris: Librairie Orientaliste Paul Geuthner.

Mundy, M. (1995) *Domestic Government: kinship, community and polity in North Yemen*. UK: Tauris Publishers.

Musch, A. (2001) *The small gods of participation*. PhD. Thesis, University of Twente, The Netherlands.

Naff, T. (1994) Conflict and water use the Middle East in Rogers and Lydon (eds.) *Water in the Arab World. Perspectives and prognoses*. Egypt: The American University of Cairo Press.

Naito, M. (1985) Water resource management in the oasis of Damascus, Man's role in changing phases of desertification. *Stuttgarter Geographischen Studien*, 105, pp. 103-104.

Nelson, N. and Wright, S. (1995) *Power and Participatory Development*. London: IT Publications



- Ngaido, N., Shomo, F. and Arab, G. (2001) Institutional change in the Syrian rangelands, *IDS Bulletin*, 32(4), pp. 64-70.
- Nijland, D. (1989) *Schaduw en werkelijkheid*. Netherlands: Leiden University Press.
- Noel, E. (1944) Qanats. *Journal of the Royal Central Asian Society*, 31, pp. 191-202.
- O'Fallon, L.R. and Dearry, A. (2002) Community-Based Participatory Research as a Tool to Advance. *Environmental Health Sciences in Environmental Health Perspectives*, 110 (2).
- Obaid, T (2002) Demographic Dynamics in the Middle East; a view from the United Nations, Policy Watch. No 621. USA: The Washington Institute.
- Olson, M. (1965) *The logic of Collective Action: public goods and the theory of groups*. USA: Harvard University Press.
- Ostrom, E. (1986) How inexorable is the “tragedy of the commons”? Institutional arrangements for changing the structure of social dilemmas. Distinguished Faculty Lecture, Indiana University, Workshop in Political theory and policy analysis, USA.
- Odum, H. (1971) *Environment, power and society*. New York:Wiley-Interscience.
- Ostrom, E. (1990) *Governing the commons; the evolutions of institutions for collective action*. UK: Cambridge University Press.
- Ostrom, E. (1998) A behavioural approach to the rational choice theory of collective action. *American Political Science Review*, 92(1), pp. 1-22.
- Ostrom, E. (2000) Collective Action and the Evolution of Social Norms. *Journal of Economic Perspectives*, 14(3), pp. 137-158.
- Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) (2002) *The Drama of the Commons*. USA: National Academy Press.
- Pavao-Zuckerman, M.A. (2000) The conceptual utility of models in human ecology. *Journal of Ecological Anthropology*, 4, pp. 31-56.

Pero, L. (2005) From governance rhetoric to practical reality: making community-based natural resource management decision-making work. *Griffith Journal of the Environment*, June 2005 (1), Ecopolitics XVI conference, pp. 1-30.

Popper, K. (1972) *Objective knowledge: An evolutionary approach*. Oxford: Clarendon Press.

Procopius (1914) *History of the wars Books I and II*. (H.R. Dewing, trans.) Harvard: Harvard University Press.

Procopius (1914) *Building*. (H.R. Dewing, trans.) Harvard: Harvard University Press.

Putnam, R. (1993) *Making Democracy work, civic traditions in Modern Italy*. USA: Princeton.

Putnam, R. (2000) *Bowling alone, the collapse and revival of the American Community*. NY: Simon and Schuster.

Rabo, Annika (1984) *Great Expectations: Perception on Development in North East Syria*, Sweden: University of Stockholm.

Rabo, Annika (1986) *Change on the Euphrates, villagers, townsmen and employees in Northeast Syria*. Studies in Social Anthropology. Sweden: University of Stockholm.

Rae, J., Arab, G. Nordblom, T., Jani, K. and Gintzburger, G. (2002) Tribes, state and Technology Adoption in Arid Land Management in Syria in Meinzen-Dick, R. *et al* (eds.) (2002) *Innovation in Natural Resource Management, the role of property rights and collective action in developing countries*. USA: IFPRI.

Reenberg, A. and Paarup-Laursen, (1996) Determinants for Land Use Strategies in a Sahelian Agro-Ecosystem, Anthropological and Ecological Geographical Aspects of Natural Resource Management. *Agricultural systems*, 53, pp. 209-229.

Rogers P, and Lydon, P. (1996) *Water in the Arab World, Perspectives and Prognoses*. Cairo: American University Press.

Rose, C. (2002) Common property, regulatory property and environmental protection: comparing community-based management to

tradable environmental allowances in Ostrom, E., Dietz, Th., Dolsak, N., Stern, P., Stonich, S. and Weber, E. (eds.) *The Drama of the Commons*. USA: National Academy Press, pp. 233-259.

Safadi, C. (1990) La Foggara, système hydraulique antique, serait-elle toujours concevable dans la mise en valeur des eaux souterraines en Syrie ? in Geyer, B. (ed. ) *Techniques et pratiques hydro-agricoles traditionnelles en domaine irrigué, approche pluridisciplinaire des modes de culture avant la motorisation en Syrie, Tome 2*. Paris: Librairie orientaliste Paul Geuthner.

Saint James-the-Mutilated Monastery (2004) Briefing I & II- Renovation of the water system “Qanats” in ‘Ayn al Taybeh, Qarah, project reports, Syria.

Salih, A. (2006) Qanats, a unique groundwater management tool in arid regions: the case of Bam Region in Iran, paper presented at the International Symposium on Groundwater sustainability (ISGWAS), Spain.

Salman, M. (2004) Institutional Reform for Irrigation and Drainage in Syria: Diagnosis of Key Elements. Syrian Expatriates Conference, Damascus, Syria.

Salman, M. and Mualla, W. (2003) The utilization of water resources for agriculture in Syria; analysis of current situation and future challenges, paper presented at the Erice International Seminars on Planetary Emergencies, 18-26 August 2003, Italy.

Salzman, P.C. (1999) *The anthropology of real life, events in Human Experience*. USA: Waveland Press.

Schmidt, A. & Westphalen, S. (2005) “Christian art and identity in Medieval Syria. Qarah, Dair Mar Yakub – the “Museum Fragments” Damascus, May 20-22, 2004, *Hugoye: Journal of Syriac Studies*, 8(1) [online] URL: <http://syrcom.cua.edu/syrcom/Hugoye>.

Schweers, W. *et al.* (2004) Farmers response to water scarcity and salinity in a marginal area of Northern Syria. *Journal of Applied Irrigation Science*, 39(2), pp. 241-252.

Scoones, I. (1999) New ecology and the social sciences: what prospects for a fruitful engagement? *Annual Review of Anthropology*, 28, pp. 479–507.

Schouten, T. and Moriarty, P. (2003) *Community water, community management, from system to service in rural areas*. UK: ITDG Publishing.

Seymour-Rolls, K. & Hughes, I. (1998) Participatory Action Research : Getting the Job Done. Australia, Sydney University [online] URL: <http://www.scu.edu.au/schools/gcm/ar/arr/arrow/rseymour.html>

Sharabi, H. (1977) Impact of class and culture on social behaviour: the feudal-bourgeois family in Arab society in Bron & Itzkowitz, *Psychological dimensions of Near Eastern Studies*. New Jersey: The Darwin Press, Princeton.

Somanathan, E., Prabhakar, R. and Singh Mehta, B. (2002) Collective action for forest conservation: does heterogeneity matter ? discussion paper 02-01, Indian Statistical Institute, Dehli, India.

Sourdel, D. (1968) *La Civilisation de l'Islam Classique*. Paris: France.

Soussan, J. (1998) Water, irrigation and sustainable rural livelihoods in Carney, D. (ed.) (1998) *Sustainable Rural Livelihoods, what contribution can we make?* UK: Department for International Development (DFID).

Stepp, J. R., E. C. Jones, M. Pavao-Zuckerman, D. Casagrande, and R. K. Zarger (2003) Remarkable properties of human ecosystems. *Conservation Ecology* 7(3): pp. 11. [online] URL: <http://www.consecol.org/vol7/iss3/art11/>

Sterling, P. (1998) *Turkish villages*. UK: University of Kent.

Sullivan, P. (1999) Globalization: Trade and Investment in Egypt, Jordan and Syria since 1980. *Arab Studies Quarterly* (ASQ), pp. 21-35.

Sutton, S. (1984) the Falaj: a traditional cooperative system of water management. *Waterlines*, 2(3), pp. 8-12.

Swain, A. (1998) A New Challenge: Water Scarcity in the Arab World. *Arab Studies Quarterly* (ASQ), pp. 20-21.

Tate, G. (1992) *Les campagnes de la Syrie du Nord du IIe au VIIe siècle*. Paris: IFAPO.

Technoexport (1964) The Geological Map of Syria, 1:200.000. Syrian Arab Republic Ministry of Industry, Department of Geological and Mineral Research, Damascus, Syria.

Thomas, D. (2000) Wells as signatures of social change. UK: Sheffield university [online] URL: <http://www.shef.ac.uk/assem/issue7/index.htm>

Thomas, R. *et al* (2004) Towards integrated natural resources management (INRM) in dry areas subject to land degradation: the example of the Khanasser Valley in Syria *in* Sustainable Management of Marginal Drylands (SUMAMAD) proceedings of the second international workshop in Shiraz, Islamic Republic of Iran, 29 November – 2 December 2003. France: UNESCO.

Trollalden, J.M. (ed.) (1997) Water Laws, Water Institutions, and Water Supply Economics in The Arab Republic of Syria, The Republic of Lebanon. Oslo: CESAR.

Tully, D. (1990) Household labour Issues in West Asia and North Africa *in* Labor and Rainfed Agriculture in West Asia and North Africa. The Netherlands: Kluwer Publishers, pp. 67-92.

Underwood, C. and Jabre, B. (2003) Arab Women Speak Out: self-empowerment via video *in* White, S., *Participatory video; images that transform and empower*. UK: Sage Publications, pp 235-251.

UNDP (2006) Human Development Report 2006, Beyond scarcity, power, poverty and the global water crisis. New York: United Nations. [online] URL: <http://hdr.undp.org/hdr2006/report.cfm>

UNDP (2005) The Millennium Development Goals in the Arab Region (summary). New York: United Nations.

UNDP (2003) The Arab Human Development Report 2003. New York: United Nations.

UN-Habitat (2005) Islamic land tenures and reform, Islam, land & property research series, paper 2. United Nations Human Settlements Programme (UN-HABITAT)

Uphoff, N. (1996) *The Rehabilitation of Altruism and Cooperation in Learning from Gal Oya*, possibilities for participatory development and post-Newtonian Social Science, paperback editions. UK: IT publications, pp 326-356.

Uphoff, N. (1998) Community-based natural resource management; connecting micro and macro processes and people with their environments, Plenary Presentation, International CBNRM Workshop, Cornell International Institute for Food, Agriculture, and Development; Cornell University, 10-14 May 1998, Washington D.C., USA.

Uphoff, N. & Wijayarathna, C.M. (2000) Demonstrated benefits from social capital: the productivity of farmer organizations in Gal Oya. *World Development*, 28(11), pp.1875-1890.

Van Velsen (1967) *The Extended-Case Method and Situational Analysis*. London: UK.

Varisco, D. (1983) Sayl and Gghayl: The ecology of water allocation in Yemen. *Human Ecology* 11(4), pp. 365-383.

Vermillion, D. (2001) Property rights and collective action in the devolution of irrigation management systems, CAPRI, CGIAR [online] URL: <http://www.capri.cgiar.org/pdf/vermillion.pdf>

Vermillion, D. (2004) Collective Action and Property Rights for Sustainable Development – Irrigation, Collective Action and Property Rights, focus 11. USA: IFPRI.

Vincent, L. (1990) The politics of water scarcity: irrigation and water supply in the mountains of the Yemen Republic, Irrigation Management Network Paper 90/3e, ODI/IIMI, UK/Sri Lanka.

Vincent, L. (1995) *Hill Irrigation Water and Development in mountain agriculture*. UK: Intermediate Technology Publications/ODI.

Vincent, L. (2003) Towards a smallholder hydrology for equitable and sustainable water management. *Natural Resource Forum*, 27(03), pp. 108-116.

Vogt, K. A., J. C. Gordon, J. P. Wargo, D. J. Vogt, H. Asbjornsen, P. A. Palmiotto, H. J. Clark, J. L. O'Hara, W. S. Keeton, T. Patel-Weynand, and

E. Witten (eds.) (1997) *Ecosystems: balancing science with management*. New York: Springer-Verlag.

Vuren, G. van, Papin, C. and El-Haouari, N. (2005) Participatory Irrigation Management: comparing theory with practice a case study of the Beni Amir irrigation scheme in Morocco *in* La modernisation de L' Agriculture irriguée, Tome 2. Rabat : Institut Agronomique et Vétérinaire Hassan II.

Wade, R. (1988) *Village republics, economic conditions for collective action in South India*. UK: IDS.

Wadsworth, Y. (1998) What is Participatory Action Research? In Action Research International, Paper 2. [online] URL: <http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html>

Wakil, M.(1993) Analysis of Future Water Needs of Different Sectors in Syria. *Water International*, 18, pp. 18-22.

Waterbury, J. (2002) *The Nile Basin National Determinants of Collective Action*. USA: Yale University Press.

Water Resources Information Center (WRIC) (2005) WRIC Newsletter, December 2005, WRIC/MOI, Syria [online] URL: <http://www.wric-sy.org/english/index.htm>.

Weaver, W. (1949) *Recent contributions to the mathematical theory of communication*. USA: University of Illinois Press.

Weisgerber, G. (2003) The impact of the dynamics of qanats and aflaj on oases in Oman, comparisons with Iran and Bahrain in Proceedings of the International Frontinus Symposium 2-5 October 2003, Walferdange, Luxemburg,

Welch, J.R. (1996) The dry and drier, cooperation and conflict in Moroccan Irrigation *in* Mabry, J.B. (ed.) *Canals and Communities*. Tucson: University of Arizona Press, pp. 69-87.

Werner, J. (1993) *Participatory development of agricultural innovations, procedure and methods of on-farm research*. Germany: GTZ, Die Deutsche Bibliothek.

Wessels, J. (2004) Reviving ancient water tunnels in the desert —Digging for gold ? paper presented at the UNU conference “Living with Desert”, Tokyo, Japan.

Wessels, J. (2003) Qanats in Syria, ease the water shortage. *Waterlines*, 22(2): pp. 8-10.

Wessels, J.I. (2003) Criteria for renovating and using ancient qanats in Syria-case studies in Proceedings of the International Frontinus Symposium 2-5 October 2003, Walferdange, Luxemburg, 12 pp.

Wessels, J.I. (2003) Community action for evaluating the use of common water resources in Syria *in* Faces of Poverty, Capabilities, mobilization and institutional transformation, proceedings of the International CERES Summerschool 2003, KIT, Amsterdam, Netherlands, pp. 358-376.

Wessels, J.I. and Hoogeveen, R.J.A. (2003) Renovation of Qanats in Syria *in* Zafar Adeel (ed.), *Sustainable Management of Marginal Drylands; Application of Indigenous Knowledge for Coastal Drylands*. Japan: United Nations University, pp. 168-189.

Wessels, J.I., R. Hoogeveen, Aw-Hassan, A., Arab, G. (2003) the Potential for Renovating Qanat Systems in Syria through community action - final project report for NRMP, ICARDA, Syria, 110 pp.

Wessels, J.I. (2002) Final Report -Traditional Water Management in Dry Areas “Qanats in Syria” Phase 3, United Nations University, Tokyo, Japan. 14 pp.

Wessels, J.I. (2002) Traditional Water Management in Syria; an evaluation of the qanats of Syria, in Proceedings Oman International Conference 2002 on the Development and Management of Water Conveyance Systems (Aflaj), Muscat Oman, Ministry of Regional Municipalities, Environment and Water Resources (*in press*) 9 pp.

Wessels, J.I., Arab, G., Aw-Hassan, A. (2001) Participatory Survey on Institutions and Ground-water use, Aleppo Province, Syria - project report for NRMP, ICARDA, Syria, 29 pp.

Wessels, J.I. (2001) Are informal institutions adequate for co-operation on water use ? A case of qanats in the Middle East. *INAMO Journal on the Middle East*, 27 (7), pp. 22-26.



Wessels, J.I. (2001) Assessment of sustainable qanat renovation, a pilot study in Shallalah Saghira - project report for NRMP, ICARDA, Syria, 62 pp..

Wessels, J.I. (2001) Dangerous digital intimacy – response to David McDougall. *Anthropology Today*, 17( 5), pp. 24-24.

Wessels, J.I. (2000) Little Waterfall: Renovating Qanats in a changing World, a Case Study in Syria, in Proceedings First International Conference on Qanats, Yazd, Iran, UNESCO.

Wessels, J. I. (1996) The Effectiveness of communication in a Health Education Programme in Gedaref, Sudan, (unpublished) MA thesis, Department of Visual Anthropology. Leiden: Leiden University.

Wilkinson, J.C.(1977) *Water and tribal settlement in South-East Arabia, a study of the Aflaj of Oman*. Oxford: Clarendon Press.

Wittfogel, K. (1957) *Oriental despotism, a comparative study of total power*. USA:Yale University Press.

White, S. (2003) *Participatory video; images that transform and empower*. UK: Sage Publications.

World Bank (2000) Middle East and North Africa Regional Water Initiative workshop on sustainable groundwater management, Sana'a Republic of Yemen, June 25-28, 2000, summary report, World Bank/Swiss Agency for Development and Cooperation (SDC), Yemen.

World Bank (2002) Reaching the Rural Poor, A Rural Development Strategy for the Middle East and North Africa Region, Rural Development, Water, Environment and Social Group Middle East & North Africa Region, The World Bank, World Bank, USA.

Wulff, H.E. (1968) The qanats of Iran, *Scientific American*, pp. 94-105.

Wutmann, M., Gonon, T., Thiers, C. (2000) The Qanats of Ayn-Manawir (Kharga Oasis Egypt) in Proceedings First International Conference on Qanats, Yazd, Iran, UNESCO (*unpublished*)

Wyant, J. , Richard A. Meganck, Sam H. Ham, (1995) Ecological Restoration: An Integral Link in Technology Transfer, *INSIGHT* Spring 1995, UNESCO [online] URL:  
<http://www.unep.or.jp/ietc/Publications/INSIGHT/Spr-95/6.asp>

Zakarya, N. (2005) Building urban livelihoods, two generations in an unauthorized settlement in Damascus. PhD. Thesis, University of Amsterdam.

Zvi, R. (1989) Qanats and spring flow tunnels in the Holy Land in Beaumont, P., Bonine, M. & Mc Lachlan, K., (eds.) *Qanat, Kariz and Khattara. Traditional water systems in the Middle East and North Africa*. London: Middle East and North African Studies Press Ltd., pp. 211-237.