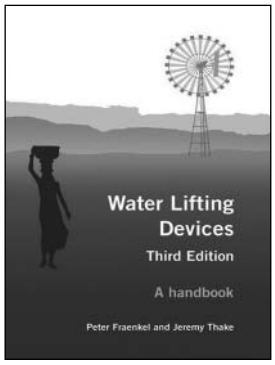
Reviews and resources



Water Lifting Devices: A Handbook
Peter Fraenkel and Jeremy Thake 2007 (third edition), Practical Action Publications and FAO, 352pp, £19.95, ISBN: 9781853395383

When I agreed to write a review of this book and had a glance at it, I frowned: 337 pages of technical information on water pumps is a long journey. But after reading a few pages I got hooked and found reading the book not to be a chore but quite interesting.

The book gives the reader a full insight into the subject of lifting water from the ground. The way the book is structured leads the reader from the theory to the practical examples to the financial issues. An interested non-engineer should quite easily be able to understand the information provided. All in all, the book is a comprehensive piece of work and a complete compendium. For small-scale water supplies or irrigation schemes, it explains most of the feasible technical options in an understandable way, gives a good insight into the historical background, and also provides the basics for the calculation of sizing and design of the systems.

The authors clearly favour renewable energies, especially wind power, which is described over 30 pages. In contrast the chapters on internal combustion engines and on electrical power are short. Renewable energies (solar or wind) should be promoted. However most irrigation pumps use electric or diesel power, with which the overall energy conversion efficiency is 0.5 to 27 per cent. Matching the individual components in the system can reduce these losses. I would have liked to see more emphasis on the potential energy savings if, for instance, motorized irrigation systems had their delivery pipes optimized. (My guess, several times higher than the potential for savings from renewable energies.)

I liked the chapter on financial and economic considerations; it leads the reader to look at aspects other than only 'the cheapest' investment costs. The trade-off between 'low capital investment and high recurrent cost' vs. 'high capital cost and low recurrent cost' is a very important consideration especially where institutions pay for the capital investment and users have to pay for the recurrent cost. However (it might be because I am an engineer) it is the chapter that is relatively difficult to follow. Understanding the meaning of terms such as 'net present value' or

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'discounted cash flow', etc. is likely to outstrip the comprehension of many readers.

Having said nice things about the book, let me mention a slightly annoying feature. The text often refers to figures or tables. These figures are often not on the same page as the text referring to them. It is necessary to turn over one or two pages to look them up.

The book is not very user friendly as a handbook in which the reader wants to look up a specific topic. Today electronic encyclopedias are more common in which hyperlinks in the text lead the reader directly to the respective chapters or keywords. It might be worthwhile to consider publishing the next edition as a CD with these hyperlinks included.

There is a slight bias towards giving more information on water for irrigation than on drinking water. A person who deals with irrigation schemes might find the book more useful than a drinking water engineer.

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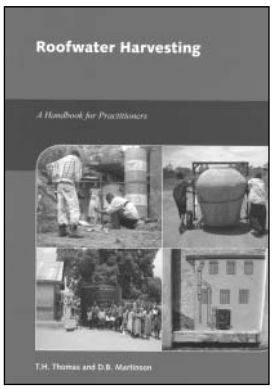

Roofwater Harvesting: A Handbook for Practitioners
T.H. Thomas and D.B. Martinson
2007, IRC, 160 pages, ISBN 9789066870574

Roofwater Harvesting and the extensive research and field testing of designs on which it is based represents a significant contribution to the quest to improve access to water for poorly served households in the 'humid tropics'. This concise, comprehensive handbook and supporting websites will provide an essential guide for anyone involved in planning, promoting, constructing or assessing domestic roofwater harvesting (DRWH) systems.

Water scarcity due to population growth, pollution and climate change is a growing concern for water professionals everywhere, but it is the poorest women, in the poorest countries, facing the daily drudgery of carrying water long distances who truly understand what water scarcity means. A key insight offered by this handbook is that in many situations in the tropics low cost DRWH systems could end much of that drudgery. The greatest advantage household rainwater collection offers over most other affordable water sources is convenience. In the past, with a few notable exceptions such as north-east Thailand, the absence of affordable tank designs and recognition of DRWH as a conventional water supply option by policymakers has stifled its widespread implementation. This publication provides the tools needed and a step-by-step guide for both decision-makers and practitioners to assist them to determine the viability of DRWH, and the appropriate designs and strategies for ensuring wider replication.

The handbook is divided into two. Part A, aimed at water

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programme decision-makers, addresses the questions: When should DRWH be considered a water supply option? How might it be delivered and how might it be combined with other water sources? Part B is aimed at those actually implementing DRWH systems and covers issues including tank sizing, selecting the most appropriate tank type, and the critical importance of good gutters and advice regarding their type, size, shape, slope, installation, maintenance and cleaning. The close attention to the proper installation and maintenance of guttering is reassuring as this is so often the 'Achilles heel' resulting in otherwise well designed and constructed systems seriously under-performing.

For any household that has a moderately sized impermeable roof located in a region with mean annual rainfall of 800 mm or more, a clean, convenient water supply is potentially available. The problem is that the large storage tank needed for providing most of the household's domestic water needs will be unaffordable to most people and smaller tanks, while cheaper, are more likely to run dry and remain empty longer. The authors illustrate how to choose the optimum tank size to meet different needs and how the performance of smaller tanks can be significantly improved by the application of a simple rationing schedule. The design and maintenance of systems to reduce health risks is also discussed and how best to ensure that the quality of water entering and stored in the tank is protected through the use of various simple but effective first flush devices, inlet screens, outlet design and outflow arrangements.

Among other topics covered are examples of how DRWH systems might be implemented in a range of scenarios from householders installing or upgrading systems, to situations where NGOs or government might subsidize implementation. The economic viability of systems, calculation of payback time, comparisons with other technologies and how DRWH systems might be incorporated into determinations of 'safe water coverage' are addressed in the first of two appendices. The other gives a brief overview of 16 tank designs not covered in detail in the main text. Throughout the book and in the final chapter there are extensive references to relevant websites and other sources of information for the reader who might, for example, need the design details for constructing a particular tank. This includes reference to the excellent website on DRWH set up by the authors at www.eng.warwick.ac.uk/dtu/rwh which, for anyone interested in this topic, is well worth a visit.

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