



Rainwater Harvesting Technologies

Global Markets to 2022

March 2018

Srinivasa Rajaram

Report Code: ENV038A

Table of Contents

Chapter 1: Introduction	1
Overview	1
Reasons for Doing this Study	1
Scope of Report.....	1
Information Sources.....	2
Methodology.....	2
Geographic Breakdown.....	2
Analyst's Credentials.....	9
Related BCC Research Reports.....	9
Chapter 2: Summary and Highlights	11
Chapter 3: Market and Technology Background	14
Overview	14
Water Sources for Water Harvesting Systems.....	14
Rainwater	14
Stormwater.....	15
Gray Water	15
Groundwater	15
Condensate Water	16
Multisource	16
Classification of Methods of Harvesting Rainwater.....	16
Passive Water Harvesting Systems.....	16
Active Water Harvesting Systems	17
Plant Production Water Harvesting Systems.....	18
Micro-catchment Rainwater Harvesting System.....	18
External Catchment Rainwater Harvesting System.....	18
Floodwater Farming or Floodwater Harvesting System.....	19
Rainwater Harvesting.....	19
Urban Rainwater Harvesting	20
Reasons for Rainwater Harvesting	21
Advantages of Rainwater Harvesting Systems.....	22
Disadvantages of Rainwater Harvesting Systems	23
Rainwater Harvesting Based on Collection Method	23
Quality of Roof Water	24
Components of Rainwater Harvesting Systems.....	24
Catchment Areas.....	25
Conveyance Systems.....	26
First-flush and Filtering Devices for Rainwater Harvesting.....	28
First-flush Devices	28
Filtering Devices	29
Types of Filters	29
Pre-storage Treatment.....	30
Storage Systems for Rainwater Harvesting.....	30
Storage for Direct Use	31
Rainwater Containers.....	31
Storage Tanks	31
After-storage Treatment	32
Distribution/Delivery Systems in Rainwater Harvesting.....	33

Piping Systems.....	33
Pumps and Pressure Tanks.....	33
Recharge Structures in Rainwater Harvesting	34
Methods and Techniques for Groundwater Recharge.....	34
Common Recharging Methods.....	35
Groundwater Recharge in Rural Areas.....	37
Life Cycle Assessment	38
Life Cycle Cost.....	39
Technology Life Cycle	39
Design Tips for Rainwater Harvesting Components	39
Design Tips for Collection of Rainwater	40
Rooftop Design Tips.....	40
Design Tips for Storage Tanks	40
Design Tips for Groundwater Recharge	41
Design Tips for Pump Products	41
History of Rainwater Harvesting	42
Earliest History of Rainwater Harvesting	42
Recent History of Rainwater Harvesting	43
Chapter 4: Market Breakdown by Technology Type	46
Global Market for Types of Rainwater Harvesting	46
Regional Market for Rainwater Harvesting	47
Market for Rainwater Harvesting in North America	49
Market for Rainwater Harvesting in Latin America.....	49
Market for Rainwater Harvesting in the Western Europe Region	50
Market for Rainwater Harvesting in the Eastern Europe Region.....	50
Market for Rainwater Harvesting in the Asia-Pacific Region	51
Market for Rainwater Harvesting in the Rest of World Region	52
Regional Market for Rooftop-based Rainwater Harvesting.....	52
Regional Market for Land-based Rainwater Harvesting	53
Global Market for Rainwater Harvesting by Segment.....	55
Global Market for Rooftop-based Rainwater Harvesting by Segment	56
Global Market for Land-based Rainwater Harvesting by Segment.....	57
Global Market for Storage Components of Land-based Rainwater Harvesting.....	58
Global Market for Components of Rooftop-based Rainwater Harvesting.....	60
Regional Market for Components of Rooftop-based Rainwater Harvesting	61
Global Market for Catchment Area Components in Rooftop-based Rainwater Harvesting	62
Global Market for Components of Catchment Areas by Region.....	63
Global Market for Conveyance System Components in Rooftop-based Rainwater Harvesting.....	64
Global Market for Components of Conveyance Systems by Region.....	65
Global Market for of First-flush/Filtering System Components in Rooftop-based Rainwater Harvesting	66
Global Market by Region for First-flush and Filtering System Components.....	67
Global Market for Types of First-flush Filters.....	68
Global Market for Components of Storage Systems in Rooftop-based Rainwater Harvesting.....	68
Market by Region for Storage System Components	69
Global Market for Components of Distribution/Delivery Systems in Rooftop-based Rainwater Harvesting	70
Market for Distribution/Delivery System Components by Region.....	71
Global Market for Components of Recharge Structures	72
Market by Region for Recharge Structure Components	73
Global Market for Miscellaneous Components in Rainwater Harvesting Equipment.....	74

Market by Region for Miscellaneous Components	75
Chapter 5: Market by End User	77
End Uses of Rainwater Harvesting	77
Global Market for Rainwater Harvesting Applications, by End User	77
Commercial End-user Segment of Rainwater Harvesting Systems.....	78
Regional Market for Commercial End-user Applications	79
Residential End-user Segment of Rainwater Harvesting Systems	80
Global Market for Residential End-user Applications by Region	82
Industrial End-user Segment of Rainwater Harvesting Systems.....	82
Global Market by Region for Industrial End-user Applications.....	84
Chapter 6: Market Breakdown by Application	87
Overview	87
Global Market for Applications of Harvested Rainwater	87
Industrial Applications	88
Global Market for Industrial Applications Harvested Rainwater by Region	88
Laundry/Cloth Washing Applications.....	89
Global Market for Laundry Applications by Region	89
Toilet and Urinal Flushing Applications	90
Global Market for Toilet/Urinal Flushing Applications by Region.....	90
Vehicle Washing Applications	91
Global Market for Vehicle Washing Applications by Region.....	91
Landscape Irrigation Applications.....	92
Market for Landscape Irrigation Applications by Region	92
Cooling Tower Applications	93
Global Market for Cooling Tower Applications by Region	94
Fire Suppression System Applications	94
Global Market for Fire Suppression System Applications by Region	94
Boiler Makeup Applications of Harvested Rainwater	95
Global Market for Boiler Makeup Applications by Region.....	95
Miscellaneous Applications	96
Street Sweeper Tank Filling	96
Animal Systems	96
Hand Watering	96
Washing of Food Crates	97
Market for Miscellaneous Applications by Region.....	97
Chapter 7: Patent Review	99
Significance of Patents	99
Importance of Patent Analysis	99
Analysis of Sample U.S. Patents.....	100
Patent Analysis Based on Country of Origin.....	100
Patent Analysis Based on Year Issued	101
Patent Analysis Based on Technology	101
Patent Analysis Based on Patents Issued to Companies	102
Some Do-It-Yourself (DIY) Methods of Rainwater Harvesting.....	102
Installing a Rain Barrel.....	102
Creating a Rain Garden.....	103
Rain Chain.....	103
Recharging Wells and Bore Wells.....	103

Splash Block Setup.....	103
Rain Saucer	103
Chapter 8: Analysis of Market Opportunities	105
Overview	105
Market Drivers	105
Market Challenges	106
Legislation/Status of Rainwater Harvesting Around the World	106
India	106
United States	108
Australia	109
China	109
Ireland	109
Canada	110
Israel	110
Sri Lanka	110
United Kingdom.....	110
Germany.....	110
New Zealand.....	110
South Africa	111
Mergers and Acquisitions in Rainwater Harvesting and Related Industries.....	111
Institutions and Organizations Involved in Rainwater Harvesting.....	114
Chapter 9: Company Profiles	118
Appendix 1 Sample U.S. Patents	184
Appendix 2 List of Manufacturers	189
About BCC Research.....	212
About BCC Research.....	213
BCC Membership	213
BCC Custom Research	213

List of Tables

Summary Table: Global Market for Rainwater Harvesting, by Segment, Through 2022 (\$ Millions)	12
Table 1 Global Market for Rainwater Harvesting, by Type, Through 2022 (\$ Millions)	46
Table 2 Global Market for Rainwater Harvesting, by Region, Through 2022 (\$ Millions)	48
Table 3 North American Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	49
Table 4 Latin American Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	49
Table 5 Western Europe Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	50
Table 6 Eastern Europe Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	51
Table 7 Asia-Pacific Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	51
Table 8 Rest of World Market for Rainwater Harvesting, by Country, Through 2022 (\$ Millions)	52
Table 9 Global Rooftop-based Rainwater Harvesting Market, by Region, Through 2022 (\$ Millions)	52
Table 10 Global Land-based Rainwater Harvesting Market, by Region, Through 2022 (\$ Millions)	54
Table 11 Global Rainwater Harvesting Market, by Segment, Through 2022 (\$ Millions)	55
Table 12 Global Rooftop-based Rainwater Harvesting Market, by Segment, Through 2022 (\$ Millions)	56
Table 13 Global Land-based Rainwater Harvesting Market, by Segment, Through 2022 (\$ Millions)	58
Table 14 Global Storage Component Market for Land-based Rainwater Harvesting, by Type, Through 2022 (\$ Millions)	59
Table 15 Global Rooftop-based Rainwater Harvesting Market, by Component, Through 2022 (\$ Millions)	60
Table 16 Global Rooftop-based Rainwater Harvesting Component Market, by Region, Through 2022 (\$ Millions)	61
Table 17 Global Market for Catchment Areas by Component, Through 2022 (\$ Millions)	62
Table 18 Global Market for Catchment Area Components by Region, Through 2022 (\$ Millions)	63
Table 19 Global Market for Conveyance Systems in Rooftop-based Rainwater Harvesting, by Component, Through 2022 (\$ Millions)	64
Table 20 Global Market for Conveyance System Components, by Region, Through 2022 (\$ Millions)	65
Table 21 Global Market for First-flush and Filtering Systems, by Component, Through 2022 (\$ Millions)	66
Table 22 Global Market for First-flush and Filtering System Components, by Region, Through 2022 (\$ Millions)	67
Table 23 Global Market for First-flush Filters, by Type, Through 2022 (\$ Millions)	68
Table 24 Global Market for Storage System Components, by Type, Through 2022 (\$ Millions)	69
Table 25 Global Market for Storage System Components by Region, Through 2022 (\$ Millions)	70
Table 26 Global Market for Distribution/Delivery Systems, by Component, Through 2022 (\$ Millions)	70
Table 27 Global Market for Market for Distribution/Delivery System Components, by Region, Through 2022 (\$ Millions)	71
Table 28 Global Market for Recharge Structures, by Component, Through 2022 (\$ Millions)	72
Table 29 Global Market for Recharge Structures by Region, Through 2022 (\$ Millions)	73
Table 30 Global Market for Miscellaneous Components for Rooftop-based Rainwater Harvesting Systems, by Component, Through 2022 (\$ Millions)	74
Table 31 Global Market for Miscellaneous Components by Region, Through 2022 (\$ Millions)	75
Table 32 Global Market for Rainwater Harvesting, by End User, Through 2022 (\$ Millions)	77
Table 33 Global Market for Rainwater Harvesting, by Commercial End-user Segment, Through 2022 (\$ Millions)	79
Table 34 Global Market for Commercial End-user Applications in Rainwater Harvesting Systems, by Region, Through 2022 (\$ Millions)	80
Table 35 Global Market for Rainwater Harvesting, by Residential End-user Application, Through 2022 (\$ Millions)	81

Table 36 Global Market for Residential End-user Applications of Harvested Rainwater, by Region, Through 2022 (\$ Millions).....	82
Table 37 Global Market for Rainwater Harvesting, by Industrial End-user Application, Through 2022 (\$ Millions)	83
Table 38 Global Market for Industrial End-user Applications of Harvested Rainwater, by Region, Through 2022 (\$ Millions)	84
Table 39 Global Market for Harvested Rainwater, by Application, Through 2022 (\$ Millions)	87
Table 40 Global Market for Industrial Applications for Harvested Rainwater, by Region, Through 2022 (\$ Millions)	89
Table 41 Global Market for Laundry Washing Applications, Through 2022 (\$ Millions).....	90
Table 42 Global Market for Harvested Rainwater for Toilet/Urinal Flushing Applications, by Region, Through 2022 (\$ Millions).....	91
Table 43 Global Market for Harvested Rainwater for Vehicle Washing Applications, by Region, Through 2022 (\$ Millions)	92
Table 44 Global Market for Landscape Irrigation Applications of Harvested Rainwater, by Region, Through 2022 (\$ Millions).....	93
Table 45 Global Market for Cooling Tower Applications of Harvested Rainwater, by Region,Through 2022 (\$ Millions)	94
Table 46 Global Market for Fire Suppression System Applications of Harvested Rainwater by Region, Through 2022 (\$ Millions).....	95
Table 47 Global Market for Boiler Makeup Applications of Harvested Rainwater, by Region, Through 2022 (\$ Millions)	96
Table 48 Global Market for Miscellaneous Applications of Harvested Rainwater by Region, Through 2022 (\$ Millions)	97
Table 49 U.S. Patents Related to Rainwater Harvesting, by Country of Origin, March 2010-Oct. 2017 (Number).....	100
Table 50 U.S. Patents Related to Rainwater Harvesting by Year Issued, March 2010-Oct. 2017 (Number)	101
Table 51 U.S. Patents Related to Rainwater Harvesting Based on Technology, March 2010-Oct. 2017 (Number).....	101
Table 52 U.S. Patents Related to Rainwater Harvesting Issued to Various Companies, March 2010-October 2017 (Number).....	102
Table 53 Mergers and Acquisitions in Rainwater Harvesting and Related Industry, Jan.2014 to Oct. 2017	111
Table 54 List of Global Organizations Involved in Rainwater Harvesting and Allied Activities.....	114
Table 55 Sample U.S. Patents for Rainwater Harvesting Issued from March 2010 to Oct.2017.....	184
Table 56 List of Manufacturers of Equipment for Rainwater Harvesting and Related Fields	189

List of Figures

Summary Figure Global Market for Rainwater Harvesting, by Segment, 2016-2022 (\$ Millions)	12
Figure 1 Global Market for Rainwater Harvesting, by Type, 2016-2022 (\$ Millions)	47
Figure 2 Global Market for Rainwater Harvesting, by Region 2016-2022 (\$ Millions).....	48
Figure 3 Global Rooftop-based Rainwater Harvesting Market, by Region, 2016-2022 (\$ Millions).....	53
Figure 4 Global Land-based Rainwater Harvesting Market, by Region, 2016-2022 (\$ Millions)	54
Figure 5 Global Rainwater Harvesting Market, by Segment, 2016-2022 (\$ Millions)	56
Figure 6 Global Rooftop-based Rainwater Harvesting Market, by Segment, 2016-2022 (\$ Millions)	57
Figure 7 Global Land-based Rainwater Harvesting Market, by Segment, 2016-2022 (\$ Millions).....	58
Figure 8 Global Storage Component Market for Land-based Rainwater Harvesting, by Type, 2016-2022 (\$ Millions)	59
Figure 9 Global Rooftop-Based Rainwater Harvesting Market, by Component, 2016-2022 (\$ Millions)...	61
Figure 10 Global Market for Catchment Areas by Component, 2016-2022 (\$ Millions).....	63
Figure 11 Global Market for Conveyance Systems in Rooftop-based Rainwater Harvesting, by Component, 2016-2022 (\$ Millions).....	65
Figure 12 Global First-flush and Filtering System Market, by Component, 2016-2022 (\$ Millions)	67
Figure 13 Global Market for Storage System Components, by Type,2016-2022 (\$ Millions)	69
Figure 14 Global Market for Distribution/Delivery Systems, by Component, 2016-2022 (\$ Millions).....	71
Figure 15 Global Market for Recharge Structures, by Component, 2016-2022 (\$ Millions).....	73
Figure 16 Global Market for Miscellaneous Components for Rooftop-based Rainwater Harvesting Systems, by Component, 2016-2022 (\$ Millions)	74
Figure 17 Global Market for Rainwater Harvesting, by End User, 2016-2022 (\$ Millions)	78
Figure 18 Global Market for Rainwater Harvesting, by Commercial End-user Segment, 2016- 2022 (\$ Millions)	79
Figure 19 Global Market for Rainwater Harvesting, by Residential End-user Application, 2016-2022 (\$ Millions)	81
Figure 20 Global Market for Rainwater Harvesting, by Industrial End-user Application, 2016-2022 (\$ Millions)	84
Figure 21 Global Market for Harvested Rainwater, by Application, 2016-2022 (\$ Millions)	88



About BCC Research

About BCC Research

With our unparalleled 45-year history, BCC Research provides comprehensive analysis of global market sizing, forecasting and industry intelligence, covering markets where advances in science and technology are improving the quality, standard and sustainability of businesses, economies and lives.

BCC Membership

From market sizing and forecasts, to opportunity assessments and competitive analyses, our ever-expanding library gives you the data, insights and intelligence required to ensure your project is a success. Members benefit from ongoing, unlimited access to the category or collections of their choice, and most membership packages pay for themselves within two to three reports being accessed.

Did you buy this report? You may qualify to apply your purchase price toward a full membership. Call 866/285-7215 or e-mail info@bccresearch.com to request a demo.

BCC Custom Research

Our experts provide custom research projects to those working to identify new markets, introduce new products, validate existing market share, analyze competition and assess the potential for products to impact existing markets. With impressive academic credentials and broad and deep knowledge of global industrial markets, our independent analysts and consultants develop the facts, figures, analysis and assessments to inform the decisions that will move your company ahead. Confidential inquiries to: custom@bccresearch.com or 781/205-2429.

Disclaimer

The information developed in this report is intended to be as reliable as possible at the time of publication and is of a professional nature. This information does not constitute managerial, legal or accounting advice, nor should it be considered as a corporate policy guide, laboratory manual or an endorsement of any product, as much of the information is speculative in nature. BCC Research and the author assume no responsibility for any loss or damage that might result from reliance on the reported information or from its use.

ISBN: 978-1-62296-673-8
April 2018