List of tables

Table 2.1 Assessment questions, topics and activities 13

Table 3.1 Soil generic group (SGG) classes of the Gilbert catchment 40

Table 3.2 Streamflow summary metrics at gauging stations in the Gilbert catchment under Scenario A 71

Table 4.1 Categories of regional ecosystem (vegetation) communities 90

Table 4.2 Summary of Indigenous group tenure, residence, and natural resource management 101

Table 4.3 Major demographic indicators for the shires in the Gilbert catchment in 2011 108

Table 4.4 Overview of catchment 109

Table 4.5 State school enrolments by school from 2009 to 2013 (preliminary) 109

Table 4.6 Number and percentage of unoccupied dwellings and population for selected Statistical Local Areas 110

Table 4.7 Population triggers for community infrastructure 110

Table 4.8 Value of major economic activity in the Gilbert catchment 110

Table 4.9 Major agricultural activities and their annual value for the shires in the Gilbert catchment, in the 2010–11 financial year 111

Table 4.10 Cattle movements in the Flinders and Gilbert catchments, total from 2007 to 2011 111

Table 4.11 Summary of constructed dam in the Gilbert catchment. See Petheram et al. (2013) for more detail 115

Table 4.12 Estimated costs for road upgrades 116

Table 4.13 Road transport costs per vehicle 118

Table 4.14 Days that each major road servicing the Flinders and Gilbert catchments was closed 119

Table 4.15 Surface water entitlements and storages, ML/year 121

Table 4.16 Water use and entitlements in 2006 121

Table 5.1 Potential dams assessed in the Gilbert catchment 137

Table 5.2 Summary comments for potential dams in the Gilbert catchment 138

Table 5.3 Estimated construction cost of 3-m-high sheet piling weir 154

Table 5.4 Types of on-farm water storages 155

Table 5.5 Construction costs for a 1000-ML storage based on costs of $4/m3 for earthworks near Georgetown 161

Table 5.6 Equivalent annual cost of the construction and operation of a 1000-ML ring tank and 100 ML/day pumping infrastructure assuming a real discount rate of 7% 162

Table 5.7 Equivalent annual cost per ML for storages with different seepage rates near Georgetown 162

Table 5.8 Summary of conveyance and application efficiencies 163

Table 5.9 Water distribution and operational efficiency as nominated in water resource plans for four irrigation water supply schemes in Queensland 164

Table 5.10 Application efficiencies for surface, spray and micro irrigation systems 167

Table 5.11 Pumping costs by irrigation type 169

Table 5.12 Water quality limitations for micro irrigation systems (from Ayers and Westcott, 1985) 170

Table 5.13 Soil water content at sowing and rainfall for the 90-day period following sowing for three sowing dates (Georgetown) 175

Table 5.14 Sowing date, crop yield, price, variable cost, gross margin and break-even crop yield for dryland crops in the Gilbert catchment 177

Table 5.15 Land use categories and crops evaluated in the Assessment 179

Table 5.16 Annual cropping calendar for potential agricultural options 180

Table 5.17 Sowing date, applied irrigation water, crop yield, irrigation type, price, variable cost, gross margin and break-even crop yield for irrigated crops in the Gilbert catchment 184

Table 5.18 Land suitability classification used in the Assessment 185

Table 5.19 Sorghum (grain) (*Sorghum bicolor*) 189

Table 5.20 Mungbean *(Vigna radiata)* 192

Table 5.21 Bambatsi *(Panicum coloratum var. makarikariense)* 196

Table 5.22 Lablab (*Lablab purpureus*) 199

Table 5.23 Cotton (*Gossypium spp.*) 203

Table 5.24 Sugarcane (*Saccharum*) 206

Table 5.25 Sweet corn (*Zea mays var. saccharata*) 209

Table 5.26 Peanuts 212

Table 5.27 Indian sandalwood (*Santalum album*) 215

Table 5.28 Mango *(Mangifera indica)* 219

Table 5.29 Scheme-scale capital and operating costs for a 10,000-ha potential irrigation development and Green Hills dam 220

Table 5.30 Summary statistics for a 10,000-ha potential irrigation development and Green Hills dam 221

Table 6.1 Key features of the five scenarios used in the analysis with the North Australia Beef Systems Analysis tool for Georgetown 231

Table 6.2 Modelled results from the analysis using the North Australia Beef Systems Analysis tool, under scenarios 1 to 5 for Georgetown from 1996 to 2010 233

Table 6.3 Assumptions for analysis of irrigation investment 235

Table 6.4 Financial performance indicators for selected irrigation investment scenarios 236

Table 6.5 Net present values under selected irrigation investment scenarios 237

Table 6.6 Net present value and internal rate of return 238

Table 6.7 Assumptions for capital and operating costs for irrigation developments 240

Table 6.8 Scheme-scale capital and operating costs 241

Table 6.9 Break-even annual gross margins required under different combinations of scheme-sale capital cost and irrigated area 242

Table 6.10 Scaling factors for gross margins accounting for changed reliability (60 to 90%) and timing of failed years (early and late in the cash flow) 242

Table 6.11 Minimum water price charged by supplier to cover capital and operating costs under different combinations of scheme-sale capital cost and irrigated area 243

Table 6.12 Minimum water price charged by supplier to cover operating costs under different combinations of scheme-sale capital cost and irrigated area 243

Table 6.13 Capacity of irrigators to pay for water (break-even water price) under different combinations of gross margin and irrigation use 244

Table 6.14 Summary of labour requirements 246

Table 6.15 Population for selected statistical local areas 246

Table 7.1 Typical values of specific yield and saturated hydraulic conductivity 256

Table 7.2 Likely range of values for parameters in the Gilbert catchment 257

Table 8.1 Streamflow on the Gilbert River at the Green Hills dam site under Scenario A 281

Table 8.2 Parameters for Green Hills dam 281

Table 8.3 Assumed conveyance efficiencies for the irrigation development associated with the Green Hills dam 282

Table 8.4 Scheme-scale and farm-scale costs for the irrigation development associated with the Green Hills dam 283

Table 8.5 Critical infrastructure in the Green Hills area 284

Table 8.6 Key assumptions in the gross margin calculations for cotton under spray irrigation for the irrigation development associated with the Green Hills dam 294

Table 8.7 Key assumptions in the gross margin calculations for peanuts under spray irrigation for the irrigation development associated with the Green Hills dam 294

Table 8.8 Key assumptions in the gross margin calculations for sorghum (forage) under spray irrigation for the irrigation development associated with the Green Hills dam 295

Table 8.9 Staging of construction, farm development and crop production 297

Table 8.10 The impact of transporting unprocessed cotton to three alternative locations from the Green Hills dam irrigation development 302

Table 8.11 Range of parameter values used in analytical groundwater model at Green Hills dam irrigation development 303

Table 8.12 Summary of potential ecological, social and cultural considerations with respect to the 12,000-ha Green Hills dam irrigation development 305

Table 9.1 Streamflow on the Gilbert and Einasleigh rivers at the potential Green Hills and Dagworth dam sites under Scenario A 320

Table 9.2 Green Hills and Dagworth dam parameters 321

Table 9.3 Conveyance efficiency assumptions for the irrigation development associated with the Green Hills dam 322

Table 9.4 Assumed conveyance efficiency assumptions for the irrigation development associated with the Dagworth dam 323

Table 9.5 Scheme- and farm-scale costs for the irrigation development associated with Green Hills dam 324

Table 9.6 Indicative irrigation development, scheme-scale and farm-scale costs associated with the Dagworth dam irrigation development 325

Table 9.7 Critical infrastructure requirements in the Georgetown area 326

Table 9.8 Key assumptions in the gross margin calculations for sugarcane 333

Table 9.9 Staging of construction, farm development and crop production 336

Table 9.10 The impact of transporting sugarcane from the irrigation development associated with Green Hills dam to Georgetown and Mareeba 341

Table 9.11 The impact of transporting sugarcane from the irrigation development associated with Dagworth dam to Georgetown and Mareeba 341

Table 9.12 Range of parameter values used in analytical groundwater model at Dagworth dam and Green Hills dam irrigation developments 342

Table 9.13 Summary of likely ecological changes as a result of the Dagworth dam and Green Hills dam irrigation developments. This involved analysis of 16,000 ha of sugarcane under spray irrigation at both locations 343

Table 10.1 Streamflow on the Copperfield River at the Kidston Dam under Scenario A 358

Table 10.2 Parameters for Kidston Dam 359

Table 10.3 Assumed conveyance efficiencies for the irrigation development associated with the Kidston Dam 360

Table 10.4 Scheme-scale and farm-scale costs for the irrigation development associated with the Kidston Dam 361

Table 10.5 Critical infrastructure in the Einasleigh and Georgetown area 362

Table 10.6 Key assumptions in the gross margin calculations for Rhodes grass for irrigation development associated with the Kidston Dam 368

Table 10.7 Staging of construction, farm development and crop production 370

Table 10.8 Range of parameter values used in analytical groundwater model for the irrigation development associated with the Kidston Dam 374

Table 10.9 Summary of potential ecological, social and cultural considerations with respect to the 1000-ha irrigation development associated with Kidston Dam 375