

CONTENTS

Acknowledgments	vii
Preface	xv
1. Pushing Beyond the Earth's Limits	3
<i>Losing Agricultural Momentum</i>	4
<i>Growth: The Environmental Fallout</i>	8
<i>Two New Challenges</i>	9
<i>The Japan Syndrome</i>	11
<i>The China Factor</i>	14
<i>The Challenge Ahead</i>	17
2. Stopping at Seven Billion	22
<i>A New Demographic Era</i>	23
<i>Population, Land, and Conflict</i>	26
<i>The Demographic Transition</i>	29
<i>The Demographic Bonus</i>	33
<i>Two Success Stories</i>	34
<i>Eradicating Poverty, Stabilizing Population</i>	38
3. Moving Up the Food Chain Efficiently	40
<i>Up the Food Chain</i>	41
<i>Shifting Protein Sources</i>	43
<i>Oceans and Rangelands</i>	47

<i>The Soybean Factor</i>	50
<i>New Protein Models</i>	53

4. Raising the Earth's Productivity 59

<i>Trends and Contrasts</i>	60
<i>Fertilizer and Irrigation</i>	64
<i>The Shrinking Backlog of Technology</i>	69
<i>Future Options</i>	77

5. Protecting Cropland 80

<i>Losing Soil and Fertility</i>	81
<i>Advancing Deserts</i>	85
<i>Converting Cropland to Other Uses</i>	90
<i>Conserving Topsoil</i>	93
<i>Saving Cropland</i>	95

6. Stabilizing Water Tables 99

<i>Falling Water Tables</i>	99
<i>Rivers Running Dry</i>	105
<i>Cities Versus Farms</i>	108
<i>Scarcity Crossing National Boundaries</i>	110
<i>Raising Water Productivity</i>	111

7. Stabilizing Climate 118

<i>Rising Temperatures, Falling Yields</i>	119
<i>Temperature Trends and Effects</i>	122
<i>Raising Energy Efficiency</i>	126
<i>Turning to Renewable Energy Sources</i>	128

8. Reversing China's Harvest Decline 133

<i>Grainland Shrinking</i>	134
<i>An Aquacultural Initiative</i>	142
<i>Water Shortages Spreading</i>	144
<i>Turning Abroad for Grain</i>	146
<i>A New Food Strategy</i>	151

9. The Brazilian Dilemma	156
<i>World's Leading Source of Soybeans</i>	158
<i>Feed Supplier for the World?</i>	164
<i>Meat Exports Climbing</i>	167
<i>Domestic Demand Growing</i>	170
<i>Expansion: The Risks and Costs</i>	171
10. Redefining Security	177
<i>The Tightening Food Supply</i>	178
<i>The Politics of Food Scarcity</i>	180
<i>Stabilizing the Resource Base</i>	185
<i>A Complex Challenge</i>	187
Notes	195
Index	235