Results Measurements and Impact Assessment

Managing for Results

Not to establish causality between actions and indicators, but to establish an association between actions and improvements →

- Inputs, outputs and outcomes contributing to sector objectives.
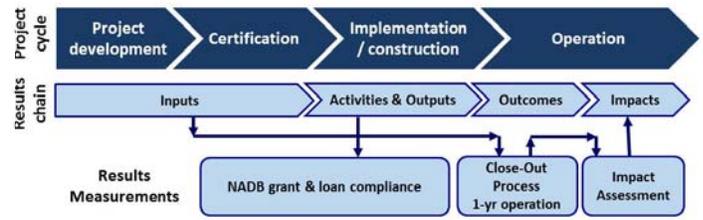- Project Results Matrix with monitoring methodology

- Vision, mission, goals and objectives.
- Four pillars - internal operational programs

Impact Assessment

Results Measurements

Balanced Score-Card

Quality Management System

Strategic Planning

- Four perspectives: Customers, Internal Processes, Internal Capacities and Financial
- Objectives, initiatives and actions with measurable targets.

- High quality process and document control
- Continuous improvement
- Preventive and corrective actions

Framework for Results Measurement

Project cycle: Project development → Certification → Implementation / construction → Operation

Results chain: Inputs → Activities & Outputs → Outcomes → Impacts

Results Measurements: NADB grant & loan compliance | Close-Out Process 1-yr operation | Impact Assessment

- ✦ Reflects experience/best practices MDB
- ✦ Emphasizes simplicity and cost-effectiveness
- ✦ Recognizes continuous system evolution
- ✦ Outcomes based on access to infrastructure
- ✦ Impacts based on use of infrastructure

Definition of appropriate, practical indicators is key to successful implementation
Drinking Water Distribution Example

Objectives
- Increase access to sustainable potable water service

Outputs
- Water distribution infrastructure built or improved (e.g. distribution lines, storage, pumping)

Outcomes
- Number of households with new or improved access to the water distribution system

Impact
- Increase in number of households connected
- Increase in number of households connected with plumbing inside house
- Increase in number of households using piped water for drinking purposes
- Increase in compliance with drinking water quality standards in the distribution system
- Increase in the reliability of the distribution system
- Reduction in the % of water loss via leaks

Impact Assessment Studies

Objective
- ✦ Assess the impact of basic sanitation infrastructure projects in the elimination of exposure to untreated wastewater

Methodology
- ✦ Results measurements framework used for objective assessment of the impact
- ✦ Baseline information gathered retrospectively from official sources
- ✦ Data obtained from projects' close-out reports
- ✦ Impact indicators
  - o Valle de Juarez 2014 Impact Assessment applied
  - o Supported by field surveys and statistical data processing
- ✦ Regular Partners are COLEF, COFEPRIS and State's water and wastewater utilities

Field Work and GIS
- ✦ Surveys
- ✦ Applied in communities related, to use of:
  - o Latrines and cesspools
  - o Quality of life
  - o Satisfaction with utility service
- ✦ Trust level = 95% (sample size); Confidence interval = 3%
- ✦ Geostatistical layers
  - o Digital platform in ArcView (only Baja California)
  - o INEGI information, survey results, and delimitation of polygons of implemented sewer systems
  - o Quantitative determination of improvements

Water quality and increase of access and use of infrastructure built.

Operational performance and environmental cost-effectiveness.

Strengthen institutional capacity.

Improved financial self-sustainability.

BECC/NADB Results Measurement Project Logframe Matrix prepared for all certified projects
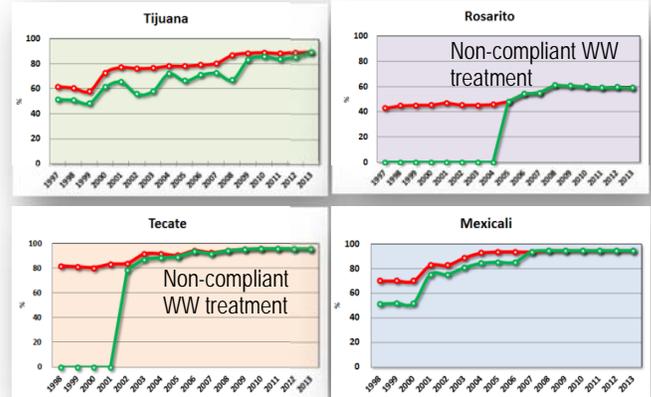
Information Management System
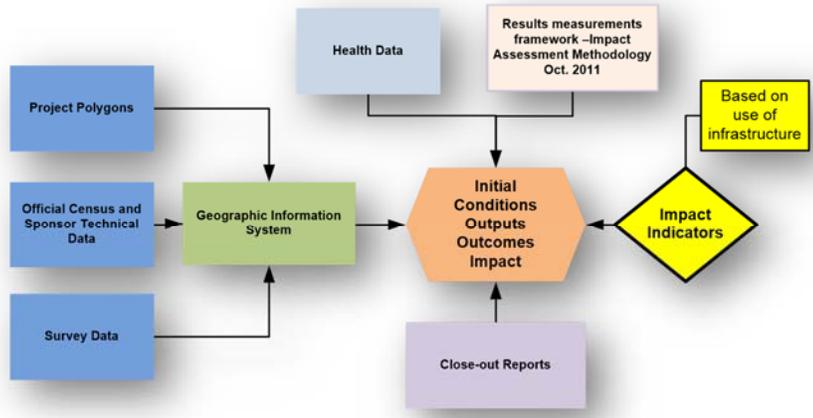
Baja California State-wide Impact Assessment

City-Wide Wastewater System

✦ 4 communities: Tijuana, Playas de Rosarito, Tecate, and Mexicali

✦ Wastewater projects: All certified between 1997 and 2012; construction completed between 2002 and 2014

Wastewater collection ━━━━━

Wastewater treatment ━━━━━

Certified Projects	Investment (US$M)
Tijuana	
Construction of 2 wastewater treatment plants, 1 WW pumping station, and 8 WW collection projects	$ 92.66
Playas de Rosarito	
Construction of 1 wastewater treatment plant, and 6 WW collection projects	$ 18.83
Tecate	
Improvement of 1 wastewater treatment plant, and construction of 2 WW collection projects	$ 11.50
Mexicali	
Construction and increase of capacity of 2 wastewater treatment plant, and 3 WW collection projects	$ 128.56
	$ 251.55

Tijuana

Rosarito — Non-compliant WW treatment

Tecate — Non-compliant WW treatment

Mexicali

Tijuana WW System / City-wide	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Population (inhabitants, - INEGI)	1,210,520	1,722,348	42%
Population connected to the WW collection system	77%	91%	18%
Existing wastewater domestic hookups	266,762	488,250	83%
Wastewater treatment coverage	73%	97%	33%
Gastrointestinal diseases rate (/100000)	444	320	-28%
Flow of untreated raw wastewater (L/s)	627	0	—
Outputs			
New wastewater collection lines (km)	146		
Rehabilitated WW collection lines (km)	135		
New main WW collection lines (km)	31		
2000 L/s WW pumping station	1		
Improved + expanded WW treatment (L/s) - San Antonio de los Buenos	1,100		
New WW treatment capacity (L/s) - La Morita	254		
Outcomes			
Access to WW collection infrastructure	95%		
Access to WW treatment infrastructure	100%		
Excess WW treatment capacity (L/s)	669		

Playas de Rosarito WW System / City-wide	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Population (inhabitants, - INEGI)	63,420	105,150	66%
Population connected to the WW collection system	45%	65%	44%
Existing wastewater domestic hookups	8,493	32,191	279%
WW treatment coverage (in compliance)	36%	100%	178%
Gastrointestinal diseases rate (/100000)	392	329	-16%
Flow of untreated raw wastewater (L/s)	36	0	—
Outputs			
New wastewater collection lines (km)	119.6		
Expanded WW treatment capacity (L/s) (Rosarito)	60		
Outcomes			
Access to WW collection infrastructure	80%		
Access to WW treatment infrastructure	100%		
Excess WW treatment capacity (L/s)	198		

Tecate WW System / City-wide	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Population (inhabitants, - INEGI)	77,795	111,098	43%
Population connected to the WW collection system	84%	96%	14%
Existing wastewater domestic hookups	16,454	27,710	68%
WW treatment coverage (in compliance)	0%	100%	100%
Gastrointestinal diseases rate (/100000)	526	632	20%
Flow of untreated raw wastewater (L/s)	200	0	—
Outputs			
New wastewater collection lines (km)	43		
Improved WW treatment capacity (L/s) - Tecate	200		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		
Excess WW treatment capacity (L/s)	50		

Mexicali WW System / City-wide	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Population (inhabitants, - INEGI)	764,602	1,025,743	34%
Population connected to the WW collection system	83%	95%	14%
Existing wastewater domestic hookups	162,682	488,250	200%
Wastewater treatment coverage	91%	100%	10%
Gastrointestinal diseases rate (/100000)	289	193	-33%
Flow of untreated raw wastewater (L/s)	115	0	—
Outputs			
New main WW collection lines (km)	63		
Improved and expanded WW treatment (L/s) - Zaragoza	880		
800 L/s WW pumping station	1		
New wastewater collection lines (km)	78.2		
New WW treatment capacity (L/s) - Las Arenitas and Zaragoza	1,200		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		
Excess WW treatment capacity (L/s)	330		

Baja California State-wide Impact Assessment

Certified Wastewater Collection Projects for Unserved Areas

Tijuana Project Polygons	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Residents within the project polygons	19,450	46,581	139%
Population connected to the WW collection system	0%	90%	90%
Latrines	89%	10%	-89%
Cesspools	11%	1%	-90%
Population with wastewater treatment	0%	100%	100%
Flow of untreated raw wastewater (L/s)	95	0	—
Discharge points of raw WW to the community	Multiple	Eliminated	—
Risk of residents exposure to raw WW in rainy season	100%	Eliminated	—
Satisfaction with utility service	No base-line info	91%	—
Project related well-being perception		95%	—
Outputs			
Wastewater collection lines (km)	146		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		

Projects Within the Polygons

Cuenca Rio Tijuana: WW collection system expansion (2008)

Tijuana Costero: Tijuana coast WW collection system expansion (2008)

Alcatraces: WW collection lines expansion (2011)

La Cuesta, Farallón and SEDUE-SAAS: WW collection system (2012)

Investment = US$92.66 M

Playas de Rosarito Project Polygons	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Residents within the project polygons	7,255	20,042	176%
Population connected to the WW collection system	0%	79%	79%
Latrines	89%	18%	-79%
Cesspools	11%	3%	-74%
Population with wastewater treatment	0%	100%	100%
Flow of untreated raw wastewater (L/s)	41	0	—
Discharge points of raw WW to the Pacific Ocean	Multiple	Eliminated	—
Risk of residents exposure to raw WW in rainy season	100%	Eliminated	—
Satisfaction with utility service	No base-line info	89%	—
Project related well-being perception		91%	—
Outputs			
Wastewater collection lines (km)	120		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		

Projects Within the Polygons

R1: WW collection system expansion (2006)

R2: Main WW collection system expansion of Lomas, Independencia & Aztlán (2009)

Plan Libertador WW collection system expansion (2011)

Lucio Blanco WW collection system expansion (2012)

Investment = US$18.83 M

Tecate Project Polygons	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Residents within the project polygons	9,580	14,995	57%
Population connected to the WW collection system	0%	94%	94.0%
Latrines	68%	6%	-91%
Cesspools	32%	0%	-100%
Population with wastewater treatment	0%	100%	100%
Flow of untreated raw wastewater (L/s)	31	0	—
Discharge points of raw wastewater to the Río Tecate	Multiple	Eliminated	—
Risk of residents exposure to raw WW in rainy season	100%	Eliminated	—
Satisfaction with utility service	No base-line info	92%	—
Project related well-being perception		94%	—
Outputs			
Wastewater collection lines (km)	43		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		

Projects Within the Polygons

Construction of a WW treatment plant and WW collection system improvement and expansion (2000)

WW collection system expansion (2007)

Investment = US$11.50 M

Mexicali Project Polygons	2000 - Initial environmental conditions	2015 - Impacts (Projects by BECC/NADB)	Change
Residents within the project polygons	34,454	50,560	47%
Population connected to the WW collection system	0%	98%	98.3%
Latrines	29%	1%	-96%
Cesspools	71%	0%	-99%
Population with wastewater treatment	0%	100%	100%
Flow of untreated raw wastewater (L/s)	103	0	—
Discharge points of raw wastewater to the Río Nuevo	Multiple	Eliminated	—
Risk of residents exposure to raw WW in rainy season	100%	Eliminated	—
Satisfaction with utility service	No base-line info	87%	—
Project related well-being perception		90%	—
Outputs			
Wastewater collection lines (km)	78		
Outcomes			
Access to WW collection infrastructure	100%		
Access to WW treatment infrastructure	100%		

Projects Within the Polygons

Mexicali 1: Sanitary program (1997)

Mexicali 4: WW collection system, east sector (2007)

Investment = US$128.56 M