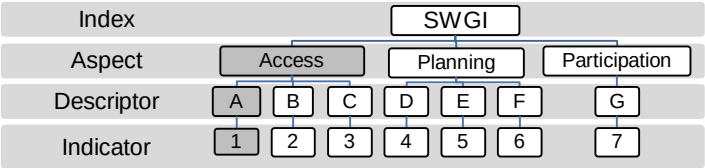
Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Access
Descriptor: (A) Costs
Indicator: (1) Water Cost
Variable: Relative Water Costs (%)

Location in the index



Brief description
Percentage of the minimum wage required to pay water and sanitation services.

Data needed
Minimum official wage at the time of calculation (August 2011): ARS 1840 (about USD 370). Average cost of water and sanitation per month for a house with 1 to 6 taps, consuming between 1 and 100 m^3 per month, located in the downtown area on a plot of land between 0 and 350 m^2: ARS 54.9 (about USD 11).

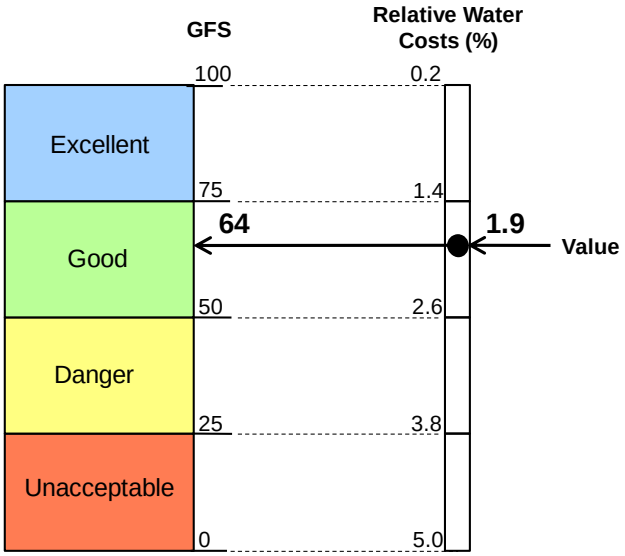
Relevance to governance for sustainability (GFS)
Economic accessibility to water and sanitation services is key for the compliance of the human right to water. It can become a problem and foster interaction processes (meetings, protests, claims) that influence the governance of the system.

Estimation methodology
The selection of the goalposts for the transformation function used was based on a report of the European Benchmarking Cooperation (EBC, 2011), which involved 45 water companies from 19 countries, with cases in Latin America and Asia. The report indicates that water services can take up to 0.2% of the family income. This value was considered as the best possible situation for GFS. In Argentina, electricity bill usually represents about 5% of the minimum income. We considered that water has to cost less than electricity, and we used that value as the low extreme in the GFS scale.

Transformation function

Y	X
GFS	Relative Water Costs (%)
0	5
100	0.2

Y = 20.8X + 104.2



References and sources of information

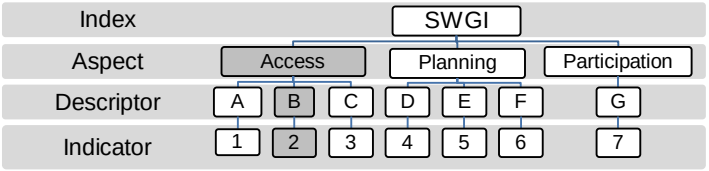
- EBC (European Benchmarking Co-operation). *Learning from international best practices. Water & Wastewater Benchmark*, EBC: Rijswijk, the Netherlands, 2011.
- Economic information from: http://www.elsalario.com.ar/main/entendetusalario/salariominimo (accessed 22 April 2012).
- Water Company (Compañía Salteña de Agua y Saneamiento S.A.– CoSAySa).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Access
Descriptor: (B) Information
Indicator: (2) Web Sites
Variable: Institutional Web Sites (%)

Location in the index



Brief description

Assessment of the quantity and quality of the information contained in the websites of the three most important institutions related to water and sanitation: the governmental regulatory agency (ENRESP-Ente Regulador de los Servicios Públicos), the provincial Secretary of Water Resources (SRH-Secretaría de Recursos Hídricos), and CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.), also known as "Aguas del Norte".

Data needed

Technical information obtained directly from the websites under assessment (Codina, 2000).

Relevance to Governance for Sustainability (GFS)

Access to relevant information was considered a crucial indicator to assess the sustainability of this system. The lack of suitable communication channels between the institutions in charge of the water system and the public in a country with high internet penetration can be considered detrimental to the sustainability of the system.

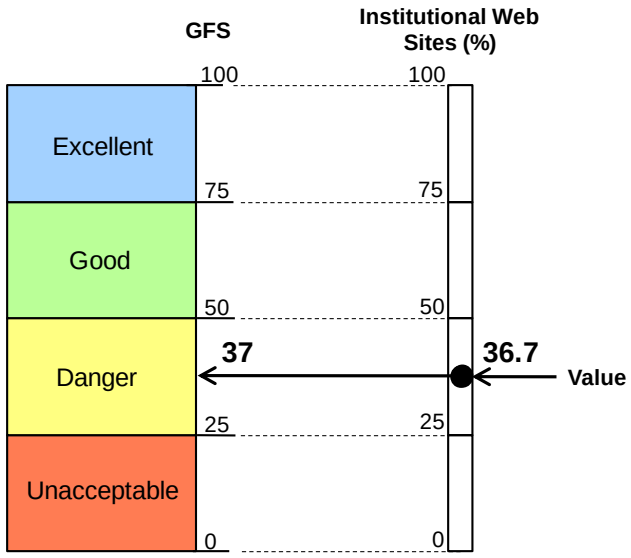
Estimation methodology

The quality of each website is evaluated by analyzing 19 technical criteria following Codina (2000). Each web site is assessed against these 19 criteria, and given a score from 0 to 100. The evaluation was performed by members of the research team. Basically, the method evaluates quantity and quality of the information contained in web sites, interaction capabilities, among other things. The overall indicator score is the result of averaging the values obtained for each web site evaluation. Scores obtained from the assessment were the following: (a) CoSAySa = 49; (b) ENRESP = 56; and (c) SRH = 5. This gives an average of 36.7%.

Transformation function

Y	X
GFS	Institutional Web Sites (%)
0	0
100	100

Y = X



References and sources of information

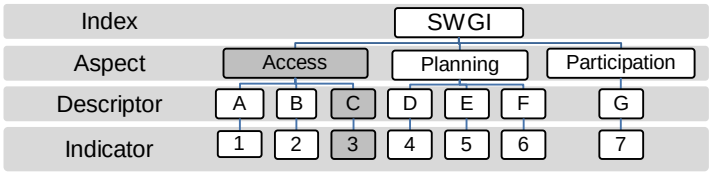
- Codina, L. Evaluación de recursos digitales en línea: conceptos, indicadores y métodos (Assessment of digital resources on line: concepts, indicators and methods). *Revista Española de Documentación Científica* **2000**, 23(1), 9-44 (in Spanish).
- Websites of CoSAySa (www.aguasdelnortesalta.com.ar); ENRESP (www.entereguladorsalta.gov.ar); and Government of Salta (www.salta.gov.ar) (all accessed 12 August 2011).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Access
Descriptor: (C) Needs
Indicator: (3) Water Needs
Variable: Basic Water Allowance (L/p.d)

Location in the index



Brief description

Amount of water supplied for free by the water company. The company has a system by which a minimum drinking water allowance of 10 m^3 is subsidized (via a government fund) to those households that demonstrate a combined income below the official poverty line.

Data needed

Free water (m^3/month) = 10; Persons per household = 3.8; Basic water allowance (L/p.d) = 87.7

Relevance for Governance for Sustainability (GFS)

The physic accessibility to a minimum amount of water to meet basic needs is a key aspect for the compliance of the human right to water.

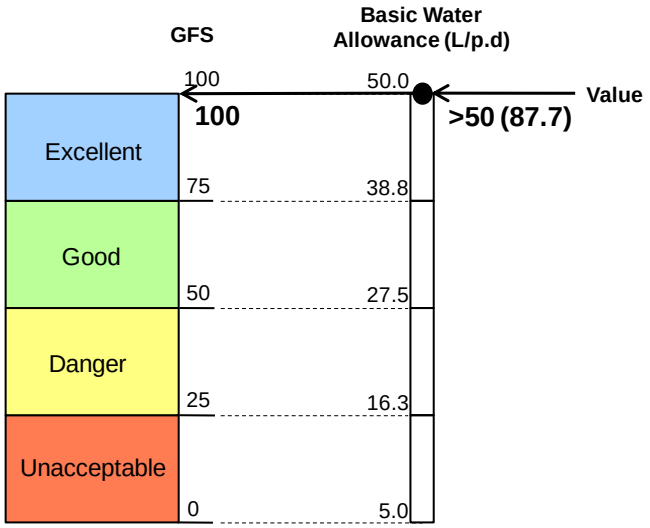
Estimation methodology

The average daily water requirement for survival is around 5 L/p.d, while a basic water requirement standard for human needs could be established at 50 L/p.d. These two values have been used as the extremes of the transformation function.

Transformation function

Y	X
GFS	Basic Water Allowance (L/p.d)
0	5
100	50

Y = 2.2X + 11.1



References and sources of information

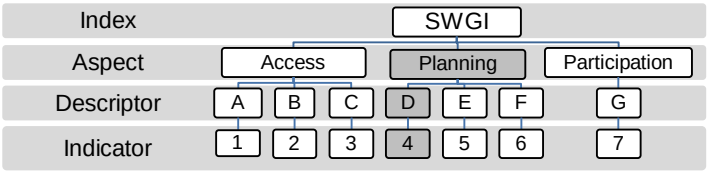
- Aguas del Norte - CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.) web page: www.aguasdelnortesalta.com.ar (accessed 10 July 2011).
- Bohoslavsky, J.; Justo, J. *Protección del derecho humano al agua y arbitrajes de inversión (Protection of the human right to water and investment conflicts)*; Colección Documentos de Proyectos; CEPAL: Santiago, Chile, 2011 (in Spanish).
- Cahill, A. The human right to water - A right of unique status: The legal status and normative content of the right to water. *The International Journal of Human Rights* **2005**, 9(3), 389-410.
- Ente Regulador de los Servicios Públicos: www.entereguladorsalta.gov.ar (accessed 12 July 2011).
- Gleick, P. Basic water requirements for human activities: Meeting basic needs. *Water international* **1996**, 21, 83-92.
- INDEC (Instituto Nacional de Estadísticas y Censos). Statistical data available online: http://www.indec.com.ar (accessed 26 May 2010) (in Spanish).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Planning
Descriptor: (D) Resources
Indicator: (4) Aggregated indicator
Variables: Several variables used to estimate three indicators: Control, Formulation, and Budget.

Location in the index



Brief description
Availability of funds, assessment of the regulation process, and public participation in the formulation of water projects.

Data needed
Information provided by local institutions through semi-structured interviews.

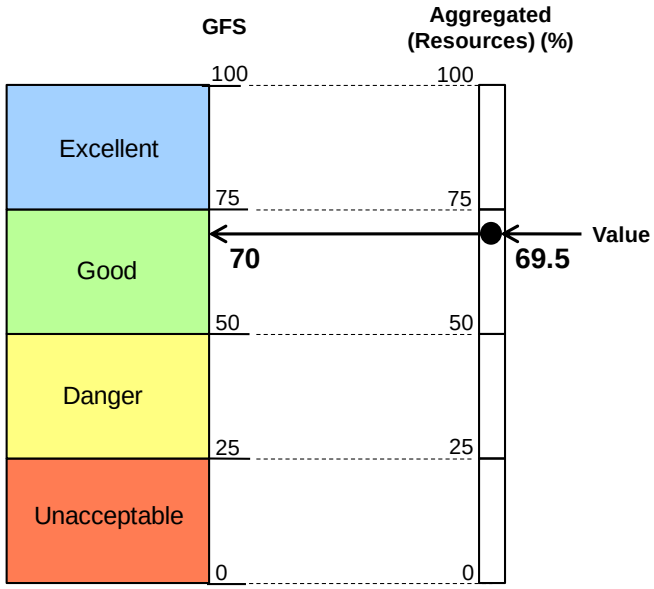
Relevance for Governance for Sustainability (GFS)
The existence of resourceful, proactive, and professional institutions can be considered as a pre-requisite for medium- and long-term planning processes. Therefore, institutional capacity reveals temporal attributes that can help ensure the effective compliance of the right to water in a framework of inter-generational justice. Descriptors and indicators for this aspect consider, among other things, the characteristics of the regulation process (clearly related to norms), the degree of public participation in the formulation of water projects (in specific nodal points), and the level of professional training within water-related institutions (an appraisal of the type of actors involved).

Estimation methodology
The Planning aspect was estimated by means of an institutional assessment that involved an evaluation of different aspects of local institutions organized in nine indicators (more details in Iribarnegaray et al., 2010).

Transformation function

Y	X
GFS	Institutional Resources (%)
0	0
100	100

Y = X



References and sources of information

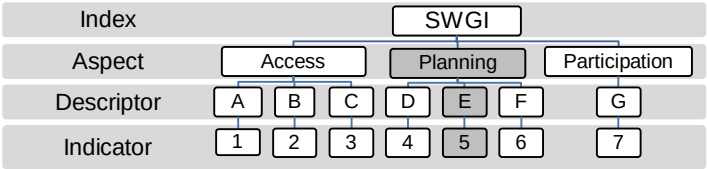
- Data provided by the governmental regulatory agency (ENRESP-Ente Regulador de los Servicios Públicos), the provincial Secretary of Water Resources (SRH-Secretaría de Recursos Hídricos), and CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.).
- Iribarnegaray, M., Copa, F.; Ruiz.; C.; Sauad, J.; Liberal, V.; Seghezzo, L. Aspectos institucionales para la evaluación de la sustentabilidad de la gestión del agua y el saneamiento en la provincia de Salta (Institutional aspects for the assessment of the sustainability of water and sanitation management in the province of Salta). *Avances en Energías Renovables y Medio Ambiente* **2010**, 14, 103-109 (in Spanish).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Planning
Descriptor: (E) Projects
Indicator: (5) Aggregated indicator
Variables: Several variables used to estimate three indicators: Horizon, Identification, and Projects.

Location in the index



Brief description
Assessment of the number, type and potential impact of the projects under execution in institutions related to water management in the city.

Data needed
Information provided by local institutions through semi-structured interviews.

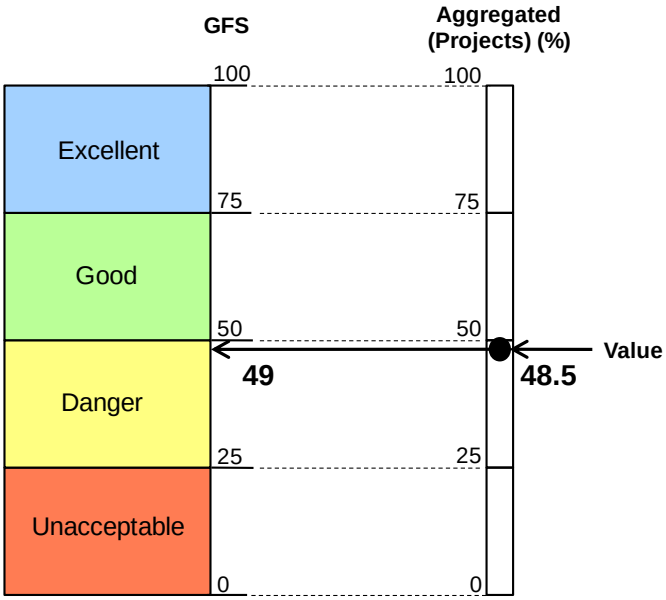
Relevance for Governance for Sustainability (GFS)
The existence of resourceful, proactive, and professional institutions can be considered as a pre-requisite for medium- and long-term planning processes. Therefore, institutional capacity reveals temporal attributes that can help ensure the effective compliance of the right to water in a framework of inter-generational justice. Descriptors and indicators for this aspect consider, among other things, the characteristics of the regulation process (clearly related to norms), the degree of public participation in the formulation of water projects (in specific nodal points), and the level of professional training within water-related institutions (an appraisal of the type of actors involved).

Estimation methodology
The Planning aspect was estimated by means of an institutional assessment that involved an evaluation of different aspects of local institutions organized in nine indicators (more details in Iribarnegaray et al., 2010).

Transformation function

Y	X
GFS	**Institutional Projects (%)**
0	0
100	100

Y = X



References and sources of information

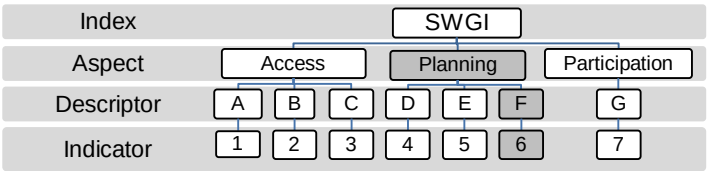
- Data provided by the governmental regulatory agency (ENRESP-Ente Regulador de los Servicios Públicos), the provincial Secretary of Water Resources (SRH-Secretaría de Recursos Hídricos), and CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.).
- Iribarnegaray, M., Copa, F.; Ruiz.; C.; Sauad, J.; Liberal, V.; Seghezzo, L. Aspectos institucionales para la evaluación de la sustentabilidad de la gestión del agua y el saneamiento en la provincia de Salta (Institutional aspects for the assessment of the sustainability of water and sanitation management in the province of Salta). *Avances en Energías Renovables y Medio Ambiente* **2010**, 14, 103-109 (in Spanish).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Planning
Descriptor: (F) Personnel
Indicator: (6) Aggregated indicator
Variables: Several variables used to estimate three indicators: Access, Satisfaction, and Capacity.

Location in the index



Brief description
Assessment of the degree of training of water managers, the satisfaction inside water institutions, and the degree of transparency in contracting processes.

Data needed
Information provided by local institutions through semi-structured interviews.

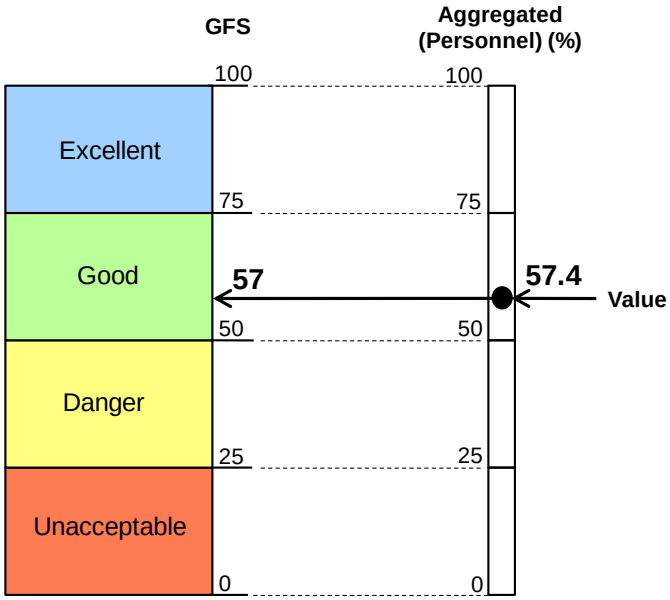
Relevance for Governance for Sustainability (GFS)
The existence of resourceful, proactive, and professional institutions can be considered as a pre-requisite for medium- and long-term planning processes. Therefore, institutional capacity reveals temporal attributes that can help ensure the effective compliance of the right to water in a framework of inter-generational justice. Descriptors and indicators for this aspect consider, among other things, the characteristics of the regulation process (clearly related to norms), the degree of public participation in the formulation of water projects (in specific nodal points), and the level of professional training within water-related institutions (an appraisal of the type of actors involved).

Estimation methodology
The Planning aspect was estimated by means of an institutional assessment that involved an evaluation of different aspects of local institutions organized in nine indicators (more details in Iribarnegaray et al., 2010).

Transformation function

Y	X
GFS	Institutional Personnel (%)
0	0
100	100

Y = X



References and sources of information

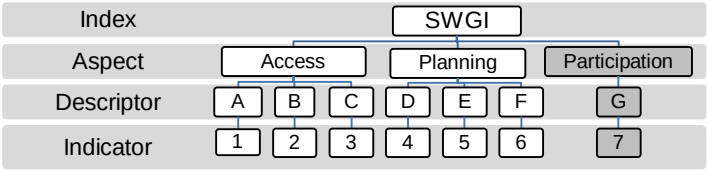
- Data provided by the governmental regulatory agency (ENRESP-Ente Regulador de los Servicios Públicos), the provincial Secretary of Water Resources (SRH-Secretaría de Recursos Hídricos), and CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.).
- Iribarnegaray, M., Copa, F.; Ruiz.; C.; Sauad, J.; Liberal, V.; Seghezzo, L. Aspectos institucionales para la evaluación de la sustentabilidad de la gestión del agua y el saneamiento en la provincia de Salta (Institutional aspects for the assessment of the sustainability of water and sanitation management in the province of Salta). *Avances en Energías Renovables y Medio Ambiente* **2010**, 14, 103-109 (in Spanish).

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.

Sustainable Water Governance Index (SWGI)

Index: SWGI
Aspect: Participation
Descriptor: (G) Interactions
Indicator: (7) Audiences
Variable: Participation Events (in particular public Audiences) organized per year by the water company (Events/year)

Location in the index



Brief description

Descriptor Interactions points to the degree of involvement of institutional and individual actors in interaction spaces where public engagement with water authorities becomes possible. This variable assesses the number of participatory events (in particular public Audiences) organized per year by the water company in order to inform and consult the public about water-related projects and investments. Public Audiences of this type can be motivating interaction spaces for users as well as other actors to exercise their civic rights and participate in water-related decision-making processes.

Data needed

Two public audiences have been held by the water company in the last 10 years.

Relevance for Governance for Sustainability (GFS)

The number of actual events reflects both the company's decision-making policy and the willingness of specific-individual or institutionalized actors to participate in water governance. Participation in these events indicates the degree of personal involvement in water and sanitation issues. This indicator/variable therefore encapsulates the personal aspects of the management system, from the most intrinsically personal (Values) to the temporal visions articulated by different actors (Worldviews) as a basis for personal and collective action in the field (Attitudes). Attitudes are behaviors and other observable expressions of values and worldviews that might affect the natural and social environment. Worldviews are the temporal and ultimately normative projections emanating from the other two indicators within this descriptor. Values are considered drivers for more conscious environmental behavior and more active social involvement

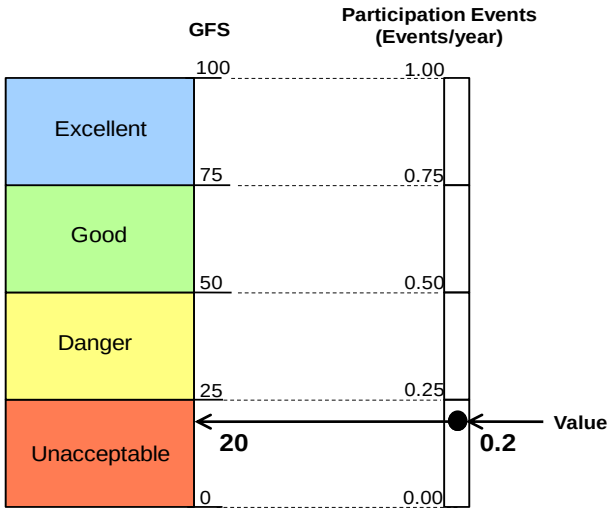
Estimation methodology

Information was gathered from official sources and local media. The transformation function was built as a comparison with a desirable situation. The conclusion of the research team was that, under local circumstance, at least one audience per year should be convened in order to determine that the system has an acceptable degree of public participation.

Transformation function

Y	X
GFS	Participation Events (Events/year)
0	0
100	1

Y = 100X



References and sources of information

- Data provided by the governmental regulatory agency (ENRESP-Ente Regulador de los Servicios Públicos) and CoSAySa (Compañía Salteña de Agua y Saneamiento S.A.).
- Information gathered from local media.

To be used as Appendix to: Iribarnegaray, M.A. and Seghezzo, L. Governance, Sustainability, and Decision Making in Water and Sanitation Management Systems. *Sustainability* **2012**, *4*, 2922-2945.