PROJECT PERIODIC REPORT

Grant Agreement number: 320303

Project acronym: DESAFIO

Project title: Democratisation of Water and Sanitation Governance by Means of Socio-Technical Innovation

Funding Scheme: Seventh Framework Programme, Theme SSH.2012.2.1-2 - Social innovation for vulnerable populations

Date of latest version of Annex I against which the assessment will be made: 13-09-2013

Periodic report: **2nd**

Period covered: **from** 1 August 2014 **to** 31 July 2015

Name, title and organisation of the scientific representative of the project's coordinator[1]:

José Esteban Castro, Professor of Sociology, Newcastle University

[Throughout the report referred to as the Project Co-ordinator]

Tel: +44 191 222 7494 - +44 7764611858

Fax: +44 191 222 5421

E-mail: esteban.castro@ncl.ac.uk

Project website[2] address: www.desafioglobal.org

[1] Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement.

[2] The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

Declaration by the scientific representative of the project coordinator

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate) [3]:

  √ has achieved most of its objectives and technical goals for the period with relatively minor deviations.

- The public website, if applicable

  √ is up to date

- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.4) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 3.2.3 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator: José Esteban Castro.

Date: ...28...../ ..10...../ .2015.....

For most of the projects, the signature of this declaration could be done directly via the IT reporting tool through an adapted IT mechanism and in that case, no signed paper form needs to be sent

[3] If either of these boxes below is ticked, the report should reflect these and any remedial actions taken.

Contents

3.1 Publishable summary

Project title and acronym:

Democratisation of Water and Sanitation Governance by Means of Socio-Technical Innovation (DESAFIO)

Project life: 1 February 2013 – 31 July 2015

Focus and context

DESAFIO literally means "challenge" in both Portuguese and Spanish. The main aim of DESAFIO was to contribute towards tackling what is arguably one of the major challenges facing humanity in the twenty-first century: eradicating the structural social inequalities and injustices that find expression in the highly unequal access to essential water and sanitation services (WSS). We examine the situation of WSS as an integral part of the broader process of economic and social development, and consider these inequalities and injustices as a major obstacle for the consolidation of substantive, not merely formal, democratic politics. DESAFIO focused on cases of vulnerable communities in Argentina, Brazil, and Colombia, although the lessons learnt are relevant to other regions.

Despite the significant progress made in Brazil and other Latin American countries in the last decade, the remaining challenges are still enormous. Although official reports related to the Millennium Development Goals (MDGs) officially announced that Latin America would be among the most advanced regions in the world and would have met the target for water supply, there is substantial evidence showing that the official figures must be read with much caution. In fact, the disparities in urban and rural sanitation coverage in the region remain daunting, while many of the improvements implemented continue to bypass the poor and most vulnerable sectors. Moreover, the evidence suggests that even when people are covered by WSS often the quality of the services is unreliable. There remain significant disparities in access to safe drinking water between urban and rural regions and among different income groups. The 2015 figures show that 97% of the urban population have access to "improved" water sources, a figure that drops to 81% for rural areas. However, these figures hide that fact that according to recent studies over half of the population with access to networked water supply is subject to poor quality services affected by intermittence and other problems. In rural areas, the situation is much direr, with between 30% and 40% of rural water systems out of order or affected by serious quality problems. In countries like Bolivia, Colombia, Ecuador, Haiti, Nicaragua, Peru, and Venezuela, 80% of the rural population still lacks sustainable access to drinking water in 2015 according to the latest reports. Similar to the case of drinking water, there are very large inequalities in the access to sanitation facilities between urban and rural areas. In 2010 there were 117 million people in the region, about 20% of the total population, without access to "improved sanitation facilities". The figure was reduced to 17% in 2015, which was not enough to meet the MDG target for the region, as 19 countries failed to meet their own targets. In rural areas, the number of people without access to "improved sanitation facilities" in 2015 raises to 36%. Although official reports suggest that open defecation in the region would have been reduced from 17% in 1990 to 3% by 2015, recent studies report that the actual figure in 2015 would be much higher, 12%. Several countries are notorious owing to the large proportion of the population still practicing open defecation: ranging from 11% in Honduras and Ecuador, 13% in Brazil, 14% in Colombia and Nicaragua, to 35% in Haiti and 46% in Bolivia.

In our perspective the main obstacles to achieve success in tackling this situation are the very low or even absent inter-sector collaboration in planning and policy implementation, the slow progress in developing meaningful interdisciplinary coordination between natural, social, and

technical scientists working in this field, and the weak democratization process in the WSS sector. Our project placed a strong emphasis on these three aspects.

The research problem, approach, and objectives

DESAFIO assumed that we need to adopt fundamentally radical socio-technical solutions, that is, interventions that go to the roots of the problem. This requires breaking with the prevailing status quo dominated by technology-centred, top-down, often paternalistic and even authoritarian solutions. It also requires going beyond the dominant situation that continues to favour the reproduction of a status quo that privileges short-term interests over the needs of vulnerable communities. In our view, public policy and technology must be subservient to the higher goal of providing universal access to safe WSS as a social and human right.

DESAFIO started from existing knowledge about socio-technical innovations that have been developed and implemented in the WSS sector with different degrees of success. Our main research questions were:

> How can we harness existing and develop new socio-technical innovations in order to change policies, to develop strategies and practical interventions, and to enhance policy learning for tackling unacceptable inequalities and injustice in the access to essential WSS?
>
> What conditions, factors and processes facilitate the emergence of socio-technical innovations in this sector?
>
> What are the critical requirements to make successful socio-technical innovations sustainable and replicable?
>
> What are the obstacles to their sustainability and replication?

To respond to these questions we combined the study of eight experiences of socio-technical innovations that we identified in Brazil (5), Colombia (2), and Argentina (1), which included the development and implementation of two new interventions implemented in Argentina and Brazil. To examine these experiences we carried out a qualitative longitudinal analysis, strengthened with mixed research methods, of ten case studies covering a wide range of experiences, from water supply systems in small rural communities in Colombia and Brazil to sewerage systems introduced in Brazilian favelas located at the heart of large metropolitan areas. Some of our cases have strong public-sector intervention while in others local communities have much of the responsibility for managing and operating the systems. We studied cases located in areas with abundant water resources and a favourable climate while others are in semi-arid regions subject to harsh environmental conditions including frequent draughts. We chose four cases where the innovations have several decades of existence, which we called "historical", and three more recent, "current" experiences from the last decade. We also examined three "interventions" implemented during the period of the research (2013-2015). A short description of our ten case studies is available in DESAFIO's web site.

Our approach assumed that responding to our research questions and actually tackling the structural inequalities and injustices in the access to essential WSS in the ground requires simultaneously addressing three fundamental aspects. Firstly, strengthening interdisciplinary coordination between social, natural and technical disciplines, but also practicing transdisciplinarity by actively involving citizen-users and other actors in the research process. Secondly, enhancing inter-sector cooperation between different levels and areas of government. Thirdly, promoting democratic politics rather than short-term market and partisan interests in the running of WSS.

Therefore, we adopted an interdisciplinary approach that brought together the social sciences, with a strong focus on political ecology, water and environmental science, engineering, health, urban and regional planning, and management science, among other disciplines. We understand that the successful development, sustainability and replicability of these socio-technical innovations requires a bottom-up approach with the active involvement of local communities, public authorities, and civil society organizations in all stages of the research-action process, from the inception through the design, implementation, monitoring, and validation process. This is what we call "transdisciplinarity in practice".

Our main **specific objectives** were:

Objective 1.	Developing a theoretical and methodological foundation for the assessment of socio-technical innovations in the field of WSS;
Objective 2.	Assessing 7 examples of recent and current innovations
Objective 3.	Designing, implementing and assessing 3 interventions developed by our team;
Objective 4.	Completing a comparative analysis of the 10 cases under study;
Objective 5.	Producing policy recommendations and instruments for the development and assessment of socio-technical innovations in this field;
Objective 6.	Identifying strategic areas for further research;
Objective 7.	Implementing a comprehensive programme of engagement and dissemination.

Work done during Reporting Period 2 and final project results

During the final 12 months of the project, we completed the remaining part of the work projected to achieve our objectives. We linked our project tasks to several objectives simultaneously. We produced regular reports about the progress of our work in our quarterly Newsletter. You can also visit our Multi-media Gallery that contains materials illustrating our activities. See also our Publications page.

In relation to **Objective 1**, we continued to work on literature research to keep ourselves up to date with theoretical and methodological developments relevant to our research problem. We also completed aspects of fieldwork involving a close interaction with practitioners, local authorities and other actors responsible for the daily running of WSS in the ground. We did this applying our inter- and transdisciplinary approach, which included engaging non-academic actors in our work, among other activities by organizing workshops, seminars, carrying out in-depth individual or collective interviews in each of the case study sites, among other. We produced documents resulting from this work, including a Working Papers Series. We also presented our work in national and international events to receive feedback and criticism from our peers and other interested actors, including representatives of the communities involved.

For **Objective 2**, we completed some pending tasks for WP2 and WP3. We completed four historical (WP2) and three current (WP3) cases of socio-technical innovations, all of them with a strong component of community participation. These cases involved:

- Two examples of the SISAR system of rural water supply implemented by the provincial government in Ceará, Brazil;
- the Condominial and the Integrated Sanitation systems implemented by successive municipal governments in Recife, Brazil;

- a precarious water-supply system developed by poor communities, without public support, in Rio de Janeiro, Brazil;
- a waste-water treatment system and a water supply system designed and implemented in two small communities (one rural, the other peripheral-urban) through a partnership between the local university (our research partner in Colombia), the public sector, and international actors, in the Cauca Valley, Colombia.

For **Objective 3**, we completed the work for WP4 that focused on the implementation of three new interventions, all of them with strong community involvement too:

- a water supply system for a small, isolated rural community originally constituted by runaway slaves (Quilombolas) in the state of Minas Gerais, Brazil; Quilombola communities are among the most deprived and marginalized in the country;
- a new SISAR project, also in the state of Ceará, which introduced a number of new elements into the system, particularly sanitation components (toilets, showers);
- an educational intervention in five rural and urban settlements, consisting in training secondary school children to understand basic scientific procedures to monitor water quality problems and raise awareness in their communities in Santa Fe, Argentina.

Objective 4 was achieved by producing two comparative reports for WP5 that included

- a systematic comparison of the case study results addressing the project's research questions
- an analysis of project results in the context of the three countries addressed in the research, Argentina, Brazil, and Colombia.

Objective 5 was achieved by producing a report for WP6 containing policy guidelines and recommendations derived from the project's findings

Objectives 6 was achieved by producing a specific report for WP6 with suggestions for further research. We elaborated this report taking into account research gaps and needs that we identified during our project work.

Objective 7 involved a crucial aspect of our work: the engagement of the communities and other actors that we work with in our case studies and in the dissemination of our work. We followed a Strategic Engagement and Dissemination Plan that we developed at the start of the project and regularly updated with new activities. As explained earlier, we engaged local communities and other actors in all stages of our research, including our publications. We have also created Case Study Advisory Committees in the sites of our ten case studies. Representatives from the communities, local authorities, local universities, and civil society organizations composed these committees. We met with and consulted these committees regularly, and organized a number of joint activities, including

- our First International Conference that took place in Recife, Brazil, on 25 February 2013
- an International Course and Seminar, delivered in Cali, Colombia, on 22-23 and 29 August 2014
- our Second International Conference, that took place in Rio de Janeiro, Brazil, on 27-28 July 2015

and two self-funded post-project events co-organized with other actors:

- an International Seminar in Recife, Brazil, on 19 August 2015
- an International Seminar in Brasilia, Brazil, on 9 September 2015.

We regularly reported our achievements in relation to **Objective 7** in the pages of our quarterly Newsletter and in our Multi-media Gallery. See also our Documents and Publications web pages.

We will maintain our website alive for the foreseeable future in order to enhance our project's engagement, dissemination, and impact generation results.

Among the key results emerging from our work, we can list the following:

- Successful socio-technical innovations in WSS can be triggered by a range of social, political, natural, and other factors and drivers, often combined in complex ways. An example:
    - An earthquake in 1994 that destroyed a water supply system in Mondomo community, Colombia, triggered the development and implementation of a highly successful innovation. This was possible thanks to a number pre-existing and emerging conditions:
        - A strong tradition of community participation, with recognized and legitimate community leaders;
        - An international collaboration between the local university and a Dutch partner that led to the development of a low-cost technology for water treatment suitable for the social and environmental conditions of the region;
        - An alliance between the public, private, and civil society sectors and the local community in response to the disaster;
        - Strong public sector support, that provided 85% of the funding needed to build the treatment plant and the system;
        - A very determined community that took responsibility for managing and operating the system until today, thus making this case an example of successful community-management of water supply systems in the country.
- Community participation is an essential factor of success for the sustainability and replicability of these innovations. However,
    - "participation" is often restricted to self-help or to the provision of funding, materials, and labour, without any involvement in decision making or monitoring of the services;
    - in other cases, "participation" is more meaningful, involving decision making, monitoring, and other important functions for the community, but it is not always sustainable in the mid and long term, which confirms findings reported in the existing literature. This can happen for a number of reasons, including changes in the political system that restrict opportunities for participation, lack of support from the relevant authorities, decay and stagnation of the systems leading to people's distrust and lose of incentives for participation, participation "fatigue" in the communities, etc.
- The State must provide strong and continued support to make the innovations sustainable and replicable. It is unfeasible and undemocratic to require vulnerable communities to have safe WSS that are fully self-sufficient. There must be a balance between the promotion of autonomy and substantive citizenship in the communities and the exercise of State responsibility for guaranteeing the provision of essential services.

Potential impact and use

We expect that the project's findings and recommendations will provide support to relevant authorities in finding feasible and sustainable solutions to tackle the protracted inequalities and injustices affecting the situation of WSS in vulnerable communities. We also expect to have a beneficial impact on the communities that we worked with, and that the results of our work will contribute to their empowerment and enhance their capacity to participate in the ongoing processes of democratization of WSS in their countries. Achieving universal access to essential WSS is in itself a core component of the exercise of substantive citizenship. However, we expect that the project will contribute to enhancing the capability of vulnerable communities to have greater control over the democratization process, achieving a better understanding of the interconnections between the provision of basic infrastructure, social and economic development, and democratic politics. The responses to our project results that we have received so far from local, regional and national authorities, service providers, civil society organizations, workers' unions, and local communities,

among other potential beneficiaries, are very encouraging in this regard. For instance, in one of our post-project engagement and dissemination events, jointly organized with civil society and community organizations that participated during the whole project, several actors expressed the benefits that they already identified in our project work. A few examples:

Excerpts from the Opening Session, International Seminar – DESAFIO Project in Recife, Brazil, 19 August 2015

"This seminar helps to make history in Brazil, the history of popular struggles in Brazil, because it is related to the major challenges facing the [democratization] of Brazilian society right now."

Luciano Roberto Rosas de Siqueira, Vice Mayor of Recife

"The issues [to sort out in Brazil] require solutions that can be applied locally, however these issues require a project of development for the country, a project for a policy of urban development, the building of sustainable cities […]. You can count on the Joaquim Nabuco Foundation, with our researchers, our analysts, our assistants, to discuss this and move forward in consolidating good practices [as the experiences to be discussed in today's seminar]. What we demand and insist on is a national funding policy [for essential public services], a policy with targets, a policy of democratic social control, that counteracts [the current politics of privatization of water and sanitation services], as this is not the country that we want. Congratulations to the organizers, you can count on the Joaquim Nabuco Foundation in this strategy."

Paulo Rubem Santiago Ferreira, President, Joaquim Nabuco Foundation, Recife

"This seminar is very timely. I participated in DESAFIO's First International Conference at the Federal University of Pernambuco […]. We are here with other directors of the Urbanitários Worker's Union to participate in this seminar […], which comes a very good moment. Brazil is undergoing effervescent times and we have to engage with this effervescence to clearly identify what is wrong with this country. Congratulations to the organizers and to all those who came to participate in this seminar."

Jaime José, Urbanitários Worker's Union, Recife

"FASE joined this project from the start because we understood the importance of the contributions that such a project could have in strengthening the struggle for water and sanitation services and to enhance democratic social control […]. We hope that the results of the project help us to move forward in the process of mobilization and democratic social control to make water and sanitation policy more systematic, effective, less dependent on the vagaries of who is in government."

Adelmo Araújo, Federation of Organizations for Social and Educational Assistance (FASE), Member of DESAFIO's Local Case Study Advisory Committee, Recife

Visit here DESAFIO's website

See details of our Project Coordination Unit

See details of our Research Team

See details of our Project Meetings

See details of our Engagement and Dissemination Meetings

See our quarterly Newsletter

See our Multi-media Gallery

3.2 Core of the report for the period: Project objectives, work progress and achievements, project management

3.2.1 Project objectives for the period 1 August 2014 – 31 July 2015 (Month 19 to Month 30)

3.2.1.1. Work Package 1. Theoretical and Methodological Framework

For reasons explained in the Periodic Report for Period I, the development of our work led us to make some changes in WP1, which included postponing the deliverable expected in Reporting Period I for Reporting Period II.

Objectives for WP1: Elaborate the theoretical and methodological foundations of the study by examining the linkages between economic and social development and access to essential WSS in six analytical dimensions: socio-political and cultural, economic-financial, health, ecological-environmental, techno-infrastructural/operational, and policy-institutional. This WP aimed to develop a common theoretical and methodological approach to ensure the comparability of the case studies (WPs 2-4) and to provide the framework for the cross-comparative analyses (WP5) and final reports and related tasks (WP6). WP1 had logical precedence but it had temporal overlapping with WPs 2-4.

WP1 period: Month 1 to Month 26
Deliverables expected for Reporting Period 2: D1.1 (Postponed from Reporting Period 1)
D1.2 in Month 24

Milestones for Reporting Period 2: none

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3.2.1.2. Work Package 2. Assessment: Historical Cases

Objectives for WP2: Evaluate the political-institutional sustainability of recent participatory approaches to the provision of water and sanitation services in vulnerable communities in Brazil and Colombia. These included four case studies, three in Brazil and one in Colombia.

WP2 period: Month 3 to Month 22
Deliverables expected for Reporting Period 2:

D2.1 A Political-institutional assessment of SISAR: Final Report
D2.2 An evaluation of participatory approaches to WSS in Zones of Special Social Interest: Final Report
D2.3 A re-assessment of social WSS technologies in vulnerable communities in Rio de Janeiro: Final Report
D2.4 Empowerment, Resilience and Sustainability: integrated WSS in rural Colombia - Final Report

Milestones for Reporting Period 2: none

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3.2.1.3. Work Package 3. Assessment: Current Cases

Objectives for WP3: Assess current strategies in the design and implementation of appropriate socio-technical solutions for the provision of water and sanitation services in conditions of social vulnerability. These included three case studies, two of them in Brazil and one in Colombia.

WP3 period: Month 3 to Month 22
Deliverables expected for Reporting Period 2:

D3.1 The SISAR model of community management of WSS: an ethnographic assessment: Final Report
D3.2 The socio-technical dimensions of the 'integrated sanitation' system in Recife: Final Report
D3.3 Community-based water associations in rural Colombia: Final Report

Milestones for Reporting Period 2: none

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3.2.1.4. Work Package 4. Intervention Cases

Objectives for WP4: Develop and implement sustainable, appropriate and innovative socio-technical interventions for the provision of safe WSS to vulnerable populations. These included three case studies, two of them in Brazil and one in Argentina.

WP4 period: Month 3 to Month 24
Deliverables expected for Reporting Period 2:

D4.1 Appropriate water technologies in an agrarian reform settlement in Minas Gerais: Final Report
D4.2 A community oriented water and sanitation system in rural North East Brazil: Final Report
D4.3 Capacity building for monitoring water quality in vulnerable communities in Argentina: Final Report

Milestones for Reporting Period 2: none

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3.2.1.5. Work Package 5. Cross comparative analysis of assessment and intervention cases

Objectives for WP5: Elaborate a systematic comparative analysis of the results and findings emerging from the assessment of existing experiences and the newly developed interventions.

WP5 period: Month 22 to Month 28

Deliverables expected for Reporting Period 2:

D5.1 Cross comparative analysis of case studies
D5.2 Cross comparative analysis of country practices within the Latin American context

Milestones for Reporting Period 2:

MS12 Electronic Conference Report: Month 25

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3.2.1.6. Work Package 6. Final synthesis, policy recommendations and identified future research needs

Objectives for WP6: Produce guidelines for the design and implementation of sustainable, appropriate and innovative socio-technical solutions for the provision of safe WSS in vulnerable communities.

WP6 period: Month 26 to Month 30
Deliverables expected for Reporting Period 2:

D6.1 Socio-technical solutions for the provision of safe WSS in vulnerable communities: a synthesis
D6.2 National, regional and EU policy guidelines for the provision of innovative WSS
D6.3 Recommendations for future research

Milestones for Reporting Period 2: none

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3.2.1.7. Work Package 7. Engagement and Dissemination

Objectives for WP7: Implement a comprehensive programme of engagement and dissemination of the project's results.

WP7 period: Month 1 to Month 30
Deliverables expected for Reporting Period 2:

D7.4 Electronic newsletter	Month 28
D7.5 Proceedings	Month 30
D7.6 Policy Briefs	Month 30

Milestones for Reporting Period 2:

MS15 Stakeholder Meeting 3: Month 30

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3.2.1.8 Work Package 8. Project Management

Objectives for WP8: Provision of overall management and coordination for the duration of the project, ensuring that the project goals are achieved and the project is run according to the time and budget proposed.

WP8 period: Month 1 to Month 30
Deliverables expected for Reporting Period 2:

D8.1 Academic, management and financial reports to EC

Milestones for Reporting Period 2:

MS19 Final meeting: Month 30

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3.2.2 Work and achievements during the final reporting period

3.2.2.1. Work Package 1. Theoretical and Methodological Framework

WP1 period: Month 1 to Month 26

Deliverables expected for Reporting Period 2: D1.1 (Postponed from Reporting Period 1)
D1.2 in Month 24

Milestones for Reporting Period 2: none

Lead partner: UNEW

Regarding the theoretical aspects, as stated in this WP's description (Annex I), we aimed "to explore the linkages between the four thematic areas covered in this proposal: WSS [water and sanitation services], economic and social development, governance and active citizenship […] in the context of vulnerable communities". We also envisaged to analyse "six main dimensions identified in the proposal: a) socio-political and cultural b) economic-financial, c) health, d) ecological-environmental, e) techno-infrastructural/operational and f) policy-institutional".

Regarding methodological aspects, our project adopted a mixed-methods approach, centred on a qualitative longitudinal analysis of ten case studies, which we consider in more detail in the sections below related to the case studies (WPs 2-4) and to the Engagement and Dissemination activities (WP7).

We designed our work for the theoretical and methodological framework focusing on the project's overall objective, which is to respond to our key research questions, as stated in Annex I:

> "How can we harness existing and develop new socio-technical innovations in order to change policies, to develop strategies and practical interventions, and to enhance policy learning for tackling unacceptable inequalities and injustice in the access to essential WSS? What conditions, factors and processes facilitate the emergence of socio-technical innovations in this sector? What are the critical requirements to make successful socio-technical innovations sustainable and replicable? What are the obstacles to their sustainability and replication?" (Annex I, page 3 of the project text; page 46 of Annex I).

We planned that the work for this WP would cover most of the project's lifetime (Month 1 to Month 26). This was the case because we decided to develop the theoretical framework in permanent dialogue with the activities of the empirical fieldwork of WPs 2-4 that lasts from Month 3 to Month 24 and with the integrative work planned for WP5 that will last from Month 22 to Month 28. As we stated in the original proposal:

> "[W]e do not see a rigid division between the development of the theoretical/methodological framework and the nominally more empirical work of the case studies. In practice, […] we conceive these tasks as interrelated, and we will revisit the theoretical and methodological framework at the end of the project when we plan to produce recommendations for future inter and trans-disciplinary research, which will also include recommendations at the

theoretical and methodological level" (Annex I, page 18 of the project text; page 61 of Annex I).

An important reason for this approach was that although DESAFIO is a social-science-led project, we conceived it as an ambitious inter- and trans-disciplinary enterprise:

> "In addition to the required interdisciplinary coordination between natural, social and technical scientists, the transdisciplinary approach is predicated on a close interaction with non-academic actors in the production and validation of knowledge, among other things to underpin policy and behavioural transformations" (Annex I, page 4 of the project text; page 47 of Annex I).

Therefore, we did not intended to have a finished theoretical/methodological framework at the start of the project that would be applied uniformly, in a top down manner, across all case studies. Rather, we conceived the original framework presented in Annex I as a starting point that would evolve during the project's life, interwoven with the empirical work, and in close interaction with our non-academic partners and stakeholders.

3.2.2.1.1. Summary of progress towards objectives, details for each task, and results

As we explained in the Periodic Report 1, we largely succeeded in moving forward WP1's ambitious research agenda, although we could not cover all aspects and dimensions of the research with the same width and depth in all our ten case studies. Also, for reasons explained in the PR1 we had postponed D1.1 "Governance, economic and social development and access to essential WSS", for Reporting Period 2. We successfully submitted this deliverable in Reporting Period 2.

D1.2 "Final Report: DESAFIO's Theoretical and Methodological Framework" was successfully submitted in Reporting Period 2.

Summing up, according to our internal evaluation we have achieved the objectives set up for WP1.

3.2.2.1.2. Reasons for deviations from Annex I and their impact on other tasks as well as on available resources and planning.

We explained in PR1 the reasons for the deviation from Annex I in relation to D1.1 and MS1. This deviation had negative impacts neither on other project tasks nor on available resources or planning. We acted with anticipation and flexibility to adapt our work to the needs of WP1 and added a number of tasks and products not originally planned in Annex I to compensate for the deviation. Similarly, for reasons explained in the management section we experienced a delay in the submission of D1.2. However, this delay did not have an impact on the completion of the work of other WPs.

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3.2.2.2. General section on Work Packages 2-4, the ten Case Studies

We included regular reports on the work done for our case studies in our quarterly Newsletter, which was published in English, Portuguese, and Spanish.

We divided our ten case studies in three groups: Historical Cases (WP2), Current Cases (WP3), and Intervention Cases (WP4). The case studies composed the core of the project, and provided the ground for the comparative analyses and final project synthesis completed during Reporting Period 2 (WP5 and WP6).

WPs 2-4 period: WP2-3 : Month 3 to Month 22
WP4 : Month 3 to Month 24.

Deliverables expected for Reporting Period 2: ten case study reports

D2.1 A Political-institutional assessment of SISAR: Final Report
D2.2 An evaluation of participatory approaches to WSS in Zones of Special Social Interest: Final Report
D2.3 A re-assessment of social WSS technologies in vulnerable communities in Rio de Janeiro: Final Report
D2.4 Empowerment, Resilience and Sustainability: integrated WSS in rural Colombia - Final Report
D3.1 The SISAR model of community management of WSS: an ethnographic assessment: Final Report
D3.2 The socio-technical dimensions of the 'integrated sanitation' system in Recife: Final Report
D3.3 Community-based water associations in rural Colombia: Final Report
D4.1 Appropriate water technologies in an agrarian reform settlement in Minas Gerais: Final Report
D4.2 A community oriented water and sanitation system in rural North East Brazil: Final Report
D4.3 Capacity building for monitoring water quality in vulnerable communities in Argentina: Final Report

Milestones for the reporting period: none

The bulk of the preparatory work for the ten case study reports was done in PR1, as reported the Periodic Report 1. In the Second Project Meeting that took place in Cali, Colombia, the Project Research Team discussed the corrections to the preliminary reports discussed in the meeting, the additional work needed to complete the case studies, and agreed a template for formatting the final case-study reports:

Title page
Preliminary matter (Acknowledgements; Lists of acronyms, tables, figures, etc.; Glossary, etc.
Chapter 1 – Introduction

Chapter 2 – Context
Chapter 3 – The socio-technical innovation
Chapter 4 – Methodology
Chapter 5 – Analysis
Chapter 6 – Discussion
Chapter 7 – Conclusions
References
Appendices

In all ten case studies, we achieved the expected result for Reporting Period 2, although most partners experienced important delays in submitting the final reports. This had the effect of delaying the work due in WP5 and WP6, which we discuss later in the relevant sections. In the next section, we provide a summary of each case study, organized by Work Package, including a final Summary of WP2-4 - Issues arising and Measures taken, placed at the end.

3.2.2.3. Work Package 2. Assessment: Historical Cases

This WP's stated objective was to "Evaluate the political-institutional sustainability of recent participatory approaches to the provision of water and sanitation services in vulnerable communities in Brazil and Colombia". The work planned involved four case studies, three of them in Brazil and one in Colombia, and the WP's period started in Month 3 and ended in Month 22. The designated lead partner in this WP was UFRJ, with the methodological support of UNEW and IMAR-UC. As explained in the Summary of WP2-4 - Issues arising and Measures taken, the Project Coordinator had to take over the co-ordination, as partner UFRJ was unable to perform this role.

The four case studies are:

> WP2.1 Political-Institutional Assessment of SISAR in (Ceará) Northeast Brazil, by partner UFMG
>
> WP2.2 The Condominial Sanitation System in Zones of Special Social Interest (ZEIS) in Recife, Brazil, by partner UFPE
>
> WP2.3 Assessment of Appropriate WSS Technologies in Vulnerable Communities in the Baixada Fluminense, Rio de Janeiro, Brazil, by partner UFRJ
>
> WP2.4 Empowerment, Resilience and Sustainability: Evaluation of an Integrated Water and Sanitation System in a Rural Community in (Cauca Valley) Colombia, by partner UNIVALLE

This WP had four deliverables expected in this reporting period,

> **D2.1** A Political-institutional assessment of SISAR: Final Report
> **D2.2** An evaluation of participatory approaches to WSS in Zones of Special Social Interest: Final Report
> **D2.3** A re-assessment of social WSS technologies in vulnerable communities in Rio de Janeiro: Final Report
> **D2.4** Empowerment, Resilience and Sustainability: integrated WSS in rural Colombia - Final Report

There were no milestones for PR2:

3.2.2.3.1. Summary of progress towards objectives and results

Overall, for this WP we achieved our objectives including the completion of expected products for the final reporting period. The Final Reports for WP2 were successfully submitted, although most partners in charge of the reports experienced delays (see Summary of WP2-4 - Issues arising and Measures taken). There have not been significant changes to the preliminary results anticipated in Reporting Period 1. We consider below the key findings for each separate case study.

WP2.1 Political-Institutional Assessment of SISAR in (Ceará) Northeast Brazil

WP2.1 formed part of three case studies focused on the experience of the Integrated Rural Sanitation System (SISAR) implemented by our partner CAGECE in the state of Ceará, Brazil. The other two cases covering SISAR are WP3.1 and WP4.2. We designed these three studies to cover different angles of the SISAR, and we treated them as an integrated study. Therefore, the three reports are complementary, although they may have overlapping content.

Partner UFMG with the participation of partner CAGECE was in charge all three cases (however, we did not allocate a budget to CAGECE in this WP).

This case study used mainly qualitative methods to study the political-institutional aspects of the creation, implementation, and sustainability of SISAR in the state of Ceará.

The main sources of evidence for this case were

a) bibliographic research;
b) documentary material from archives (CAGECE's and SISAR's);
c) systematic analysis of local press reports;
d) 36 semi-structured interviews carried out with public officers including CAGECE's and SISAR's, and provincial and national authorities, the provincial regulator, users of SISAR from eleven communities including Sobral and Crateus (those with the longest SISAR experience), representatives of community organizations, workers' unions, consultants, and fellow academics;
e) photographic record.

The work for this case provided a reconstruction of SISAR's history since its creation in the early 1990s through and agreement between the Government of the state of Ceará, CAGEGE, and the public German development bank KfW (Kreditanstalt für Wiederaufbau [Reconstruction Credit Institute]). Among the main findings and recommendations of the study, we want to highlight:

- Strengths. The implementation of SISAR brought about significant benefits for the beneficiary communities, notably:
  - It has provided regular access to water to communities that before were deprived of this service and had to travel long distances to fetch water;
  - Having water at home has meant that families have more time for other activities;
  - It has helped to improve living conditions and hygienic practices;
  - Probably jointly with other interventions (particularly in the health sector) it may have contributed to improvements in the health conditions, notably a reduction of child morbi-mortality rates;
  - It has helped to enhance people's self-esteem, as "having water at home" is a significant marker of social inclusion and access to basic rights;
  - There are clear advances in the empowerment of the beneficiary communities, as SISAR promotes transparency and responsibility in service provision, as well as community organization and social participation.
- Weaknesses. The study identified a number of aspects that need improvement, including:
  - The quality of the water delivered often fails to meet the physic-chemical and bacteriological standards for human consumption, owing to structural and operational problems with water treatment systems. The situation could worsen in view of the recent adoption of stricter standards for potable water in the country;
  - Problems with water quality have health impacts and pose additional financial pressure on families that need to buy water for human consumption elsewhere;

- A major problem is that community participation tends to decline over time and it is very difficult to bring it back to meaningful levels of engagement;
- The criteria to bring the SISAR system to a community not always follows technical guidelines and is sometimes dependent on political arrangements;
- The goal of financial self-sufficiency that marks the SISAR system is far from being achieved and it still relies heavily on public resources and support;
- There is evidence that SISAR is adopting a progressive flexibilization/precarization of working conditions of the workforce, as it involves the use of voluntary or low-paid workers for important aspects of the operations, which may transform SISAR into a low-cost WSS system;
- SISAR has also important elements of an economistic approach that promotes the notion that access to water for domestic use is a commercial good (e.g. the use of micro-meters and the disconnection for non-payment in low-income rural areas). This would be in contradiction with the implementation of policies oriented by the notion that water is a human right and a public good, principles adopted in the country's National Water and Sanitation Law.

Note: Although there were no significant modifications from the preliminary findings for WP2.1, a number of disagreements with some of the preliminary findings and their dissemination were raised by partner CAGECE during Reporting Period 2. CAGECE is in charge of the SISAR system under study. In fact, although for different reasons, the disagreements concerned all three reports produced by the case studies related to SISAR (WP2.1, WP3.1, WP4.2). See Summary of WP2-4 - Issues arising and Measures taken).

* * *

WP2.2 The Condominial Sanitation System in Zones of Special Social Interest (ZEIS) in Recife, Brazil

WP2.2 studied the implementation of the Condominial Sanitation (CS) system in low-income areas of Recife, capital of Pernambuco, the fifth largest city in Brazil. It shares several components with WP3.2, as both case studies focused on the community of Mustardinha. WP2.2 covered roughly the period 1993-2001, while WP3.2 covered 2001-2012, in total a period of nearly 20 years. Partner UFPE was in charge of both cases, with direct participation of the Project Coordinator in the research process. This arrangement was adopted to support the participation of non-academic actors (representatives of the local public sector, members of Mustardinha community, and representatives of civil society organizations) in the research process for this case.

This case study used mixed methods with a strong emphasis on participative activities as it engaged a range of non-academic actors in all stages of the research process. It examined the design of the Condominial model, which was developed by Eng. José Carlos Melo in Recife in the 1980s and implemented since 1993 in a number of low-income areas of the city, including the community of Mustardinha that was the site of the study.

The main sources of evidence for this case were

a) bibliographic research, studies on the Condominial Sanitation system, including master and doctoral dissertations from regional, national and international universities;
b) documentary material from archives (mainly from Pernambuco's Water and Sanitation Company, COMPESA, and Recife's Municipality);
c) secondary data from statistical sources (national censuses, special surveys by local, regional, and national authorities);
d) individual and collective semi-structured interviews carried out with technical experts, including the system's designer, Eng. Melo, politicians involved in the implementation of the system, public officers from COMPESA and from local, provincial, and national authorities, representatives of community organizations, workers' unions, consultants, Non-Governmental Organizations, and fellow academics;
e) participant observation;
f) workshops with members of Mustardinha community;
g) workshops with technical experts involved in the implementation and management of the system;
h) large public events to promote debate among key actors (a conference);
i) photographic, video and sound records of the activities, most of which are later transcribed and some published as Working Papers or books.

Among the main findings of the study, we want to highlight:

- The late 1980s were a time of financial crisis in the country, and the Condominial system was designed primarily as a low-cost solution to provide sewage collection to poor areas (at the time the coverage for this service in the city of Recife was around 30%). According to official government estimates, the Condominial system would allow savings of up to 65% of the costs of conventional sanitation systems.
- In the city of Recife, the implementation of the Condominial System since 1993 was adopted as a municipal public policy to solve the lack of sanitation coverage. At the time, Eng. Melo, the system's developer, became the Vice-mayor of the city. Mustardinha community was given top priority in the implementation, among other issues owing to the high rates of water-related infections, particularly lymphatic filariasis, recorded there.
- The Condominial system was innovative both in social and technical aspects.
    - Regarding social aspects, the system emerged at a time of high social mobilization and participation in the country, and Recife was one of the key centres of this mobilization, which was related to the rich intellectual and political tradition of the city. A main feature of the system connected readily with the social and political environment of the time, as it entailed a very active participation of the beneficiary population in some aspects of the implementation and maintenance of the system, especially
        - a "condominial agreement" that had to be signed by each member of the beneficiary group (a condominium composed normally of a block or blocks of houses) and the municipality, whereby the beneficiaries accepted to

        - contribute towards the cost of the construction (the contribution would be monetary or through the provision of materials, labour, etc.); and
        - maintain the system over time (e.g. cleaning pipe blockages, etc.);
    - thus, formally, the concept of "community participation" in the CS system was restricted to these aspects of self-help and voluntary work expected from the users;
        - in practice, from our interviews with officers who were in charge of the implementation, we know that much more meaningful forms of engagement and participation took place, although this depended largely on the local situation and on the particular configuration of implementation teams; that is, substantive participation was not an intrinsic component and much less a requirement of the CS;
    - Regarding technical aspects, the CS model departed from the conventional approach of large-scale networked systems, as it was based on small networks where the unit became a block of houses rather than whole neighbourhoods. The small-block-bound networks were in turn interconnected, and the sewage collected was pumped to treatment plants. The smaller dimension of the network allowed a closer control of potential problems, like blockages, thus reducing the scale and impact of potential failures of the system. Moreover, the small scale of the system was also in the diameter of the pipes (much smaller than in conventional systems), which also reduced significantly the depth of the digging. Finally, to complete this synthesis, in contrast with conventional systems where the pipelines are located in the street, in the Condominial system the pipes are normally located within the private property of the users, at either the front or the back of the houses. However, it is also possible to install the pipes in the street, which was partially the case in the location of our study.

- Strengths. The implementation of the Condominial Sanitation system brought a number of benefits to Mustardinha:
    - A section of the community became connected to the sewerage network at a fraction of the cost that a conventional system would have required (according to estimates about 30% of the cost);
    - The participative approach of the system was suited by the prevailing social and political environment of the time, and in turn contributed to the empowerment of the community through processes of mutual learning and rising awareness;
    - The intervention was a decisive action of the local authority to tackle some of the worst consequences of the long-term situation of structural inequality affecting the community, particularly the poor hygienic conditions and the high prevalence of water-related diseases.
- Weaknesses. This aspect connects with the other case study (WP3.2), which starts with a diagnosis of the situation of Recife, and Mustardinha in particular, around the year 2001 when a new intervention was introduced, the "Integrated Sanitation" system. According to the diagnosis and other studies, despite the advances introduced, the implementation of the Condominial system in Mustardinha had a number of problems, among them:

- The reliance on users' participation for the maintenance resulted in the eventual collapse and decay of the system owing to the decline of social participation over time and the lack of support from the municipality or the public utility;
    - This could be related to the limited understanding of "social participation" adopted in the Condominial system, where participation is ultimately circumscribed to contributions to the cost of construction and the maintenance of the system;
- The informal and unregulated urban development characterizing low-income areas promoted the construction of new living spaces (rooms, kitchens, etc.) often built on top of the pipelines located within the private boundaries of each property, which caused severe difficulties for the maintenance of the network and became the source of bitter disputes between neighbours (members of the condominium);
- Although the Condominial system represented an advance over conventional systems by introducing elements of preventive health (tackling the links between environment and disease vectors), it remained focused on "disease control" rather than on "health promotion" and preventive practice; this would be an explaining component of the failure of this intervention to eradicate endemic water-related diseases in Mustardinha;
- Problems connected with the ecological-environmental conditions of the community (e.g. drainage problems caused by the low level of the terrain, lack of solid waste management, the prevalence of very rudimentary sanitation facilities, etc.) did not experience much transformation despite the efforts made. At the beginning of the 21st Century, Mustardinha continued to be characterized by high destitution, precariousness, and deficient service infrastructure. A study carried out in 2001 found that this situation was reflected in very poor health and living conditions.

Note: We discussed the results of this case with Eng. Jose Carlos Melo, designer of the CS system and responsible for its implementation in Recife since the 1980s. We also interviewed him and invited him to participate in several engagement and dissemination events (the relevant references to these activities are provided in the D2.1 and in the D5.2 reports). He fully agreed with our report on the case of Recife. Our D2.1 report also makes clear that the findings of the specific case of Recife could not be overgeneralized, as the CS system has been very successful in other parts of Brazil and in other countries.

* * *

WP2.3 Assessment of Appropriate WSS Technologies in Vulnerable Communities in the Baixada Fluminense, Rio de Janeiro, Brazil

WP2.3 focused on the case of community-led water supply systems in the municipality of Queimados, located in the Baixada Fluminense in the Rio de Janeiro Metropolitan Area, Brazil's second largest urban concentration. The local population developed a community-managed system of water supply based on the use of water springs (*minas de água* in the local jargon) as an alternative to the lack of safe water supply in the area. The case focused on two neighbourhoods in Queimados served by *minas de água*, Jardim da Fonte (with an estimated 12234 households) and Vila do Rosário (around 1827 households). Partner UFRJ was in charge of this case.

This case study used a mixed methodology. The main sources of evidence are:

a) Bibliographic research
b) Secondary data from statistical sources
c) Participant observation
d) Semi-structured interviews
e) Questionnaires
    i. a preliminary questionnaire applied to users of two water springs
    ii. a more developed questionnaire applied to a probabilistic sample of the population
f) Focus groups
g) Photographic record

Summary of study findings:

Context and characterization.

- The indicators of access to basic water and sanitation services in the Baixada Fluminense region, and particularly the peripheral municipalities like Queimados, reflect unsatisfactory conditions of provision;
- The region is also regularly affected by flooding, which often leads to human casualties and material losses;
- In Queimados, part of the population is connected to the formal network operated by the Rio de Janeiro Water and Sanitation Company (CEDAE)
    - Official data report that 40.7% of the population in Queimados is connected to the sewerage network; however, in interviews with the local authority we learnt that there would be no connections at all in the municipality and that households empty their wastewater into the drainage system or use pits to dispose it; also, there is no wastewater treatment facility in the area;
    - Although official figures of coverage for water supply (83% of the population) are better than for sanitation, our findings suggest that these figures are inflated and that the coverage in Queimados would be extremely low and most of the population would obtain their water from wells of springs;
    - In any case, the quality of the water supplied by CEDAE and the intermittence of the service cause severe problems;
        - As an example, in Jardim da Fonte users report that the water supplied by CEDAE is unsafe (the tap water contains leaves, dirt, motes, etc.)
    - Our estimate of the cost of the formal WSS provided by CEDAE suggests that the average monthly expense (53.46 Reais / 17.6 Euros) would represent around 7.9% of the minimum wage (678 Reais / 224 Euros). The "social tariff" offered by CEDAE only applies to the poorest neighbourhoods, mostly favelas;
- Owing to the poor quality of CEDAE's services even those households connected to the network often resort to other sources, mainly water springs and wells
    - A recent study detected the existence of 21 springs (*minas de água*) in use by the local population;
    - An emerging hypothesis is that the use of the water springs may also have a cultural component, a preference developed by the practices of the community over time (initially triggered by the poor quality of CEDAE's services);
- The public WSS utility CEDAE does not recognize the existence of these alternative systems, but they have been recognized and are monitored by other actors, in particular

    - the Guandu River Basin Committee, which focuses on improving the access and quality of WSS and the protection of water sources in the region;
    - the local representatives of federal health authorities, especially the National Health Foundation (FUNASA);
- The collective use of the *minas de água* is subject to tacit and routine norms, such as
    - Respect for the order of arrival to collect water;
    - Priority given to children, women with children, and the elderly;
- In addition to these spontaneous mechanisms of organization, we have identified that the community recognizes "water guardians". In one particular case that we witnessed, the guardian is a member of the local neighbourhood who takes care of the cleaning and maintenance of the basic infrastructure.

Strengths.

- As the water provided by CEDAE is deemed to be unsafe, people have to resort to other sources, and the alternatives under study like the water springs offer them a free option;
- Although the ongoing debate about alternatives to democratize the access and the management of basic WSS in the area is marred by the fragility of most local and regional institutions, we identified key actors that play an important and positive role in this process:
    - the key actor leading this debate is the Guandu River Basin Committee. The Committee promotes active citizen participation in the discussion of alternatives, one of which are the community-managed water springs, the focus of this case study;
    - another relevant actor are the local representatives of federal health authorities (FUNASA).

Weaknesses.

- The quality of the water springs is variable, and some of them have been reported to be unsafe (e.g. polluted with Escherichia coli; others are suspected of industrial pollution); however, the local authorities are unable to control the quality of all the alternative sources being used by the population;
    - Deep rooted popular perceptions that the spring water is better than the water provided by the public network could be a negative factor both to
        - Developing awareness about the health risks associated with the consumption of untreated water from wells and springs;
        - Future acceptance of reforms in course to improve the quality of the public service provided by the networked system of water supply;
- There is no official record of water-related infections in the area, but in our interviews with functionaries (of FUNASA) responsible for water quality in Queimados they reported as example that cases of Hepatitis A are often treated as a common diarrhoea;
- Access to WSS and other essential services in the region is often politically mediated, and there is evidence of political clientelism associated with the construction of the basic infrastructure of some of the *minas de água* used by the population.

* * *

WP2.4 Empowerment, Resilience and Sustainability: Evaluation of an Integrated Water and Sanitation System in a Rural Community in the Cauca Valley, Colombia

This study examined the case of autonomous community management of WSS since 1993 in La Vorágine, a peri-urban town located on the banks of the Pance River in the outskirts of the Santiago de Cali Metropolitan Area, Cauca Valley, the third largest urban centre in Colombia.

Partner UNIVALLE was in charge of WP2.4. This case used a mixed methodology, with a highly participative approach involving the local community, including

a) Bibliographic research
b) Documentary research (mainly archives of the institutions involved in the intervention)
c) Secondary data from statistical sources (local, regional, national health authorities; planning authorities; municipalities involved)
d) Systematic analysis of press reports published between 1980 and 2014
e) Photographic and video archives with material from the study area
f) Semi-structured interviews with relevant actors
g) Focus groups
h) Workshops
i) Participatory Rural Appraisal techniques, including participatory mapping/socio-environmental cartography
j) A survey (in practice a census given the small size of the community)
k) Geographical Information Systems (geo-referencing, characterization, and analysis)
l) Photographic record.

Summary of study findings:

- La Vorágine provides recreational services to the population of Cali through the offer of short tourist breaks (mainly during weekends). It is located on the banks of the Pance River, the only river in the Santiago de Cali Metropolitan Area still relatively unpolluted. However, the intensification of touristic activities puts enormous pressure on the fragile ecosystems of the region including the Pance River, which provide a number of important ecosystem services to the region including water supply, hydrological regulation, and breeding sites and refuge for many species. Although La Vorágine has a stable population of some 500 people, during weekends and festivities, the population can rise to anything between 10 and 30 thousand people, which causes significant impacts. Already in the early 1980s the environmental situation, and particularly the state of the Pance River, were affected by rapid deterioration that led to a substantial decline in the number of tourists, among other issues owing to serious health risks posed by the river water. The decline in touristic activity in turn had a negative effect on the living conditions of the community;
- The introduction of decentralization in the WSS sector that started in 1987, and particularly the 1991 National Constitution that sanctioned forms of citizen participation as a component of democratic monitoring of public management processes, provided an enabling environment for the emergence of autonomous, community-based processes of management of essential basic services;
- In a context of high inequality and poor provision of basic WSS in the country affecting especially peri-urban and rural areas (still in 1997 the coverage for water supply and sanitation was 98% for both in urban areas but only 65% and 15% respectively for rural areas), this enabling environment triggered a number of projects to improve the provisions of these services in the country;

- In 1991, the CINARA Institute at UNIVALLE, with support from the Dutch government, participated in launching the Technology Transfer Programme for Water Supply Systems in the Republic of Colombia (TRANSCOL). TRANSCOL was developed on the basis of the Multi-Stage Filtration System, a technological innovation developed with the leadership of CINARA. The implementation of the Programme involved local, regional and national authorities with the active involvement of beneficiary communities;
  - Among the methodologies used to promote the participation of the communities were household visits, women-only focus groups, formal and informal interviews, creative workshops involving oral communication and artistic activities (painting, music, theatre, popular tales, etc.);
- In 1992, the public utility Municipal Enterprises of Cali (EMCALI) launched an initiative to improve the situation of WSS in the metropolitan area called "School Projects". The name indicates the strong learning component of the strategy. The participative interdisciplinary and inter-institutional methodologies used in TRANSCOL were adopted by the School Projects initiative, and the intervention implemented in La Vorágine was one of such School Projects, starting in 1993;
- The main characteristics of the intervention in La Vorágine were:
  Technical aspects:
  - The focus was on solving the problem of river pollution creatively, adapting the intervention to the local environmental and social conditions;
  - The project adapted the simplified sewerage network technology developed in Brazil for the Condominial system (considered in case WP2.2);
  - Fat traps were built in each household, which was important given that many local families earned their living by preparing food for the tourists and the wastewater was simply emptied into the Pance River;
  - Local materials were given priority, like pebble stones and native vegetation for the biological filters and built wetlands;
  - Simplified systems for sludge extraction to allow the maintenance to be carried out by low-skilled workers;
  - Energy- and chemicals-free operation of the system (also important given that the community did not have electricity at the time)

  Social aspects:
  - Through the learning process, the community
    - Came to value the quality of the wastewater emptied into the river, after understanding the significance of the socio-environmental impacts of releasing untreated water;
    - Understood the rationale of collecting, transporting, and treating wastewater;
    - Was willing to readily pay for the service;
- An important aspect of the intervention is that, despite been based on strong community participation, the system requires heavy institutional involvement and support
  - The intervention is based on an eco-technology, which requires knowledge of
    - the local environmental conditions (e.g. solar radiation, temperature);
    - uses of the receiving water bodies (where the wastewater is released);
    - pre-treatment systems for the elimination of solid matter, sands, and fats;
    - physical space to build the system (that includes the filtration and treatment plant, facilities for sludge drying, etc.);
  - It needs a functioning administration unit that
    - Has command of the technology;
    - Guarantees the flow of resources needed for the system's sustainability, especially the tasks of operation and maintenance

        - Counts with enough trained staff to carry out the tasks
        - Has institutional support to react whenever the community may need it;
- The intervention was implemented between 1995 and 1996, and was funded by local and regional public entities
    - It involved the training of community members in technical aspects to
        - monitor the infrastructure works
        - operate, maintain, and administer the system
        - control the quality of the treated wastewater before releasing it back into the environment
        - control the quality of the WSS.

Strengths

- around 86% of the population is connected to the sewerage network
- 73% of the population has clear awareness of the system in place for the collection and treatment of the community's wastewater, including the location of the treatment plant;
    - The section of the population that seems to be unaware of this information is composed mainly of people that arrived in the community during the last decade;
- 83% of the population has a positive opinion of the management of the WSS system;
    - People value the fact that the system is managed by the community and not by the local authority or a private company
- There is a well-established payment culture for WSS, 97% of the users are up to date with their payments
- The intervention has helped to recover the quality of the river and the local environment, and prompted also a strong recovery of the living conditions with the return of the tourists
    - 26% of households live on the equivalent of a monthly minimum wage (around 240 Euros)
    - 46% have an income equivalent to 1 to 2 minimum wages (240-475 Euros)
    - The top 20% reported earnings of over 2.5 minimum wages (593 Euros).

Weaknesses

- Community participation has been in decline;
    - only 46% of the respondents to our census survey said that they attend meetings and assemblies
    - 16% said that they attend only as passive listeners;
    - however, a 30% that stated that they participate more actively also stated that they have not attended meetings in the last one or two years
- 30% of the population is not satisfied with the management of solid waste, especially because of
    - the lack of separation/recycling
    - the amount of waste left by tourists.

See also Summary of WP2-4 - Issues arising and Measures taken.

* * * * * *

3.2.2.4. Work Package 3. Assessment: Current Cases

This WP's stated objective was to "Assess current strategies in the design and implementation of appropriate socio-technical solutions for the provision of water and sanitation services in conditions of social vulnerability". The work involved three case studies, two of them in Brazil and one in Colombia. This WP's period started in Month 3 and ended in Month 22. The designated lead partner in this WP was UFPE with the methodological support of UNEW and IMAR-UC. The effective co-ordination of the WP counted with the direct participation of the Project Coordinator. This arrangement was adopted to support the participation of non-academic actors (representatives of the local public sector) in the co-ordination of this WP, and also in response to emerging issues that already reported in Periodic Report 1 (see Summary of WP2-4 - Issues arising and Measures taken).

The three case studies are:

> WP3.1 Ethnographic Assessment of SISAR in (Ceará) Northeast Brazil, by partner UFMG
>
> WP3.2 Socio-Technical Dimensions of the 'Integrated Sanitation' System in Low-Income Neighbourhoods in Recife, Brazil, by partner UFPE
>
> WP3.3 Community-Based Water Associations in Colombia's Rural Areas, by partner UNIVALLE
>
> This WP had three deliverables expected in this reporting period.
>
> **D3.1** The SISAR model of community management of WSS: an ethnographic assessment: Final Report
> **D3.2** The socio-technical dimensions of the 'integrated sanitation' system in Recife: Final Report
> **D3.3** Community-based water associations in rural Colombia: Final Report

There were no milestones for this reporting period.

3.2.2.4.1. Summary of progress towards objectives and results

Overall, for this WP we achieved our objectives including the completion of expected products for the final reporting period. The Final Reports for WP3 were successfully submitted, although most partners in charge of the reports experienced delays. There have been changes to the results reported in Reporting Period 1 (see Summary of WP2-4 - Issues arising and Measures taken). We consider below the key findings for each separate case study.

WP3.1 Ethnographic Assessment of SISAR in (Ceará) Northeast Brazil

This particular case experienced an important change with respect to what was reported in Reporting Period 1 (see Summary of WP2-4 - Issues arising and Measures taken).

WP3.1 formed part of three case studies focused on the experience of the Integrated Rural Sanitation System (SISAR) implemented by our partner CAGECE in the state of Ceará, Brazil. The other two

cases covering SISAR were WP2.1 and WP4.2. The sites of this case study were the towns of Andreza and Arataca, located in the Fortaleza Metropolitan Area, which competes with the Recife Metropolitan Area to be the fifth largest urban concentration in Brazil.

We designed these three studies to cover different angles of SISAR, and we treated them as an integrated study. Therefore, the three reports are complementary, although they may have overlapping content. Partner UFMG with the participation of partner CAGECE was in charge of all three cases (however, we did not allocate a budget to CAGECE in this WP).

This case study used mixed methods, but placed the emphasis on a qualitative approach.

- 80 semi-structured and non-structured mini-interviews with local residents (roughly 40 per community). Most of these individuals were users of the SISAR's system.
- Six semi-structured interviews with representatives of each of the local associations.
- Two semi-structured interviews with the operators of each of the communities, as well as numerous chance conversations with the neighbouring community's (Itapeim) operator.
- Three semi-structured interviews with three of the SISAR-BME's managers.
- One semi-structured interview with the social coordinator of the CAGECE's Rural Sanitation Management (GESAR) service.
- One structured interview with a World Bank representative.
- Participant observations

Summary of study findings:

- SISAR, as its name suggests, is oriented at providing water and sanitation to unserved rural communities in North-eastern Brazil;
- SISAR is a Non-Governmental Organization, dependent on the public utility (CAGECE in Ceará) but with a fragile status
- In the SISAR model, the public utility (CAGECE in Ceará) is responsible for funding the physical infrastructure of the systems, while the community is in charge of maintenance and operation;
- The public utility also provides additional resources, including
    - Organizational structure
    - Technical and operational support
    - Human resources
    - Inter-institutional partnerships;
- SISAR adopts cross-subsidisation between units to balance operational and maintenance costs;
- The tariff is based on covering operational and small maintenance costs; so far SISAR did not seek a return on (or recovery of) capital investments (as said before these are covered with public funds), but in the case of the intervention studied in WP4 this is set to change, as briefly explained in WP4.2;
- SISAR adopts a decentralized framework that encourages the involvement and participation of the communities in the technical, administrative and social aspects of the systems;
- The system requires users to organize themselves in Community Associations; these Community Associations compose SISAR Units, which are organized around river basins; there are currently eight SISAR Units in Ceará;
- The Community Associations, supported by SISAR's technical experts, provide preventive and corrective assistance to the systems for
    - Water quality monitoring
    - Sanitary education

    - Delivering operational reports to CAGECE;
- SISAR provides formal spaces for community participation:
    - The General Assembly, composed by representatives of all beneficiary affiliated communities
    - The Administrative Council, composed by simple majority, also with representatives of all beneficiary communities, but participating public bodies can also have a seat
    - The Fiscal Council, composed by representatives of all beneficiary affiliated communities;

Criticisms:

This particular report on SISAR, although sharing the overall perspective presented in the WP2.1 report that SISAR would be an advance in rural sanitation policies in Brazil, arrived to a number of mostly critical conclusions about the system

- Interviews and participant observation in the communities of Andreza and Arataca suggests that SISAR users have a general lack of knowledge about how the system works
- There was a lack of information to help the users to adopt rational forms of relating to water
- Micro-metering is imperfect (e.g. air the network leads to higher readings of water usage than actual consumption), and yet it is strictly enforced
- There was a lack of studies prior to the implementation of SISAR to evaluate the capacity of the local associations to comply with the management roles required from them
- The local associations did not received training from SISAR, whether before the introduction of the system in the communities or afterwards
- The local associations and the end users did not receive support through information and communication activities from SISAR
- The local associations received a high degree of autonomy to operate but did not have prior experience in management and related activities required from them
- The study detected a poor relationship between SISAR and the local community
- It also suggested that there was a lack of accountability towards the community, and the mechanisms available to the users do not allow the identification of hidden problems in the provision of the services

Note: Partner CAGECE (in charge of the SISAR system under study) raised a number of disagreements concerning all three reports produced by the case studies related to SISAR (WP2.1, WP3.1, WP4.2). See Summary of WP2-4 - Issues arising and Measures taken).

* * *

WP3.2 Socio-Technical Dimensions of the 'Integrated Sanitation' System in Low-Income Neighbourhoods in Recife, Brazil

WP3.2 studied the implementation of the Integrated Sanitation (IS) system in low-income areas of Recife, capital of Pernambuco, the fifth largest city in Brazil. It shares several components with WP2.2, which studied the Condominial Sanitation (CS) system, as both case studies focused on the experience of Mustardinha community. WP2.2 covered roughly the period 1993-2001 (although in fact the CS is still in place today in the city) and WP3.2 covered 2001-2012, a total period of nearly

20 years. Partner UFPE was in charge of both cases, with direct participation of the Project Coordinator in the research process. This arrangement was adopted to support the participation of non-academic actors (representatives of the local public sector, members of Mustardinha community, and representatives of civil society organizations) in the research process for this case.

This case study used the same mixed methods than WP2.2, with strong emphasis on participative activities as it engaged a range of non-academic actors in all stages of the research process.

The main sources of evidence for this case were

a) bibliographic research, including master and doctoral dissertations from regional, national, and international universities;
b) documentary material from archives (mainly from Pernambuco's Water and Sanitation Company, COMPESA, and Recife's Municipality);
c) secondary data from statistical sources (national censuses, special surveys by local, regional, and national authorities);
d) individual and collective semi-structured interviews carried out with technical experts, politicians involved in the implementation of the system, public officers from COMPESA, local, provincial, and national authorities, representatives of community organizations, workers' unions, consultants, Non-Governmental Organizations, and fellow academics;
e) participant observation;
f) workshops with members of Mustardinha community;
g) workshops with technical experts involved in the implementation and management of the system;
h) a questionnaire;
i) large public events to promote debate among key actors (a conference);
j) photographic, video and sound records of the activities, most of which are later transcribed and some published as Working Papers or books.

Among the main findings of the study, we want to highlight:

- The Integrated Sanitation (IS) system was first implemented in low-income areas of Recife during the period 2001-2004. Mustardinha community received priority for the implementation owing to its extreme sanitary conditions, which was a decisive point in the electoral campaign of the year 2000.
- The new municipal government that took power in 2001 in Recife carried out a diagnosis of the situation of WSS, including the functioning of the Condominial Sanitation (CS) system implemented since 1993 and covered in WP2.2.
    - Around 50% of the households were located in *favelas*, mostly in or close to the central areas of the city;
    - 70% of low-income households in the city were subject to risks, particularly flooding and landslides;
    - The official coverage for water supply was 88%, but the quality of the water was not suited for human consumption and the service was intermittent and unreliable, particularly in poor areas, where in addition there was a system of water rationing in place;
    - The coverage for sewerage was 30%, but in poor areas 92.2% of the households were not connected to the network;

    - These and other conditions were related to the high levels of poverty (over 38% of the population) characterizing the city. The child mortality rate was nearly 30%; water-related diseases, and particularly lymphatic filariasis in communities like Mustardinha, continued to be prevalent;
- The new government decided to introduce a new approach, Integrated Sanitation (IS), to help improve the situation. The IS system proposed a holistic perspective, whereby the improvement of WSS became an integral part of a project to radically transform the living conditions in the city. There were significant differences with the Condominial System (CS) examined in WP2.2.
- As explained in WP2.2, the CS system is centred on several principles radically questioned by the IS model:
    - The CS adopted the principle generalized in the 1990s that the State cannot make the investments required to universalize the coverage for basic infrastructure services and needs to transfer responsibility to other actors or to the final users themselves;
    - therefore it is based on a low-cost technology, which produces savings of up to 65% in comparison with conventional systems;
    - these savings are mainly for the State, as an important share of the responsibility to cover the cost is transferred to the beneficiary communities, which are required to contribute in cash, with materials, or providing labour;
    - formally, the concept of community participation in the CS system was restricted to the acceptance of the co-responsibility by the beneficiaries (signature of a formal agreement with the municipality that included a commitment to provide resources and labour);
- The IS system rejects these assumptions adopting different principles and actions:
    - The interventions proposed by the IS are complex and have a high cost, because they are oriented to provide sustainable solutions not just to solve the deficit in services infrastructure but to promote improvements in the quality of life in the city as a whole;
    - The approach assumes that the high cost involved in such interventions could never be covered by the poor, who are the main beneficiaries;
    - Therefore, rather than transferring the cost and the responsibility to the poor, the IS system postulates that the State must assume the financial and political responsibility for the interventions;
    - The IS system promotes inter-federative cooperation between levels of government to maximize the use of resources and achieve the desired effects;
    - The notion of citizen participation in the IS system is more comprehensive: infrastructure interventions must be implemented within a democratic framework that promotes the participation and co-responsibility of the citizen-user in all stages, from design to maintenance in the long-term.
- The key ideas behind the IS system had been formulated in the early 1990s and partly implemented in previous experiences in the state of Sao Paulo in the same decade. They were also inspired by successful socio-political innovations introduced in the country at the time, particularly the Participatory Budgeting implemented in the city of Porto Alegre, Rio Grande do Sul, and other sites.
- The IS system places the emphasis on the democratization of the access and management of basic services by
    - Strengthening the channels of community participation
    - Providing mechanisms to facilitate the monitoring of public management by the community

    - Bringing together planning and intervention in urban, health and environmental policies, giving priority to
        - water supply, sewerage, and drainage services
        - domestic [intra-household] sanitary infrastructure
        - road paving and general urban improvements
        - solid waste collection and treatment
        - disease vector control
        - sanitary and environmental education;
    - Setting services' prices and tariffs to promote and preserve social justice;
    - Assuming that the operation and management of basic public services must be delivered by public utilities.
- The implementation of the IS system in Recife was also part of a strategy to consolidate the role of the municipality as the responsible authority for WSS. This was part of a long-standing and still unresolved dispute in Brazil about the *titularidade dos serviços de saneamento básico* [ownership of basic sanitation services] between provincial and municipal authorities. The new municipal government in Recife sought to establish its position in the matter by
    - Achieving a higher degree of control over the running of WSS in the city, which are in hands of the provincial concessionaire COMPESA
    - At the same time developing cooperative actions with COMPESA, particularly to universalize service coverage in poor areas.
- In 2001, the Municipality of Recife and the Government of the State of Pernambuco signed a Partnership Agreement that made specific provision for activities of Institutional and Technological Cooperation for Intervention in the neighbourhoods of Mangueira and Mustardinha during the period 2001-2012.
    - The Intervention was focused on six *favelas* characterized by high levels of social vulnerability and environmental unhealthiness, two of them located in Mustardinha: Beirinha and Jacaré.
- The municipal government organized the First Municipal Conference on Sanitation Services in 2002, which promoted the active participation of the population in the deliberations. The Conference adopted a number of principles to structure the design and implementation of public policies, including:
    - 1) universality, or access for all
    - 2) integrality, taking into account all the actions that may be necessary to tackle the situation in the sanitation sector as a whole
    - 3) Equity, provision of services with quality for all, with democratic participation and monitoring of public management
    - 4) Decentralization, including the takeover of the management of WSS by the municipality, in the long run;
- The design and implementation of the IS system required far-reaching reforms in the municipality's management structures
    - Creation of a dedicated Secretary of Sanitation;
    - Promotion of Integrated Planning, involving all relevant municipal structures in charge of culture, economic development, education, environment, health, housing, participatory budgeting, sanitation, urbanization, etc.
- The IS system promotes the substantive (not merely formal) participation of citizen-users through specific mechanisms, especially:
    - Integrated Sanitation Monitoring Commissions (CASI, in Portuguese)
    - Elected *Representantes de Rua* (Street Representatives) in the intervention sites

    - Sanitation Assemblies
    - Participatory Budgeting Assemblies
- The CASI integrate social and technical aspects and are designed to materialize the effective participation of the community;
    - The main objective of CASIs is to engage the community as co-responsible actors in all stages of the intervention process, from planning to monitoring and evaluation of results
    - A CASI is a collegiate body mostly composed by
        - community representatives elected in local assemblies
        - members appointed by the local authority
        - civil society representatives (NGOs, etc.)
    - CASIs are time-limited (by the duration of the infrastructure work) and have competence to monitor the implementation of the work in their communities. Their members receive specific training to be able to do they work efficiently.

Strengths:

- There is a general agreement among the actors interviewed that the IS system was highly successful in a range of important aspects:
    - It provided a viable, democratic, effective alternative to solve the problem of lack of essential sanitation services in vulnerable communities. It delivered what was promised and the quality of the interventions implemented can be verified.
    - The interventions introduced significant, in many cases radical, transformations in the livelihoods of vulnerable communities, proving them with the basic conditions needed for a dignified life. This is clearly recognized by the population in the areas of the case study, as emerges from the findings of our interviews and other activities.
    - In the area of our case study, the Mustardinha ZSSI, the situation in 2001, as described in the WP2.2 report, was characterized by extreme vulnerability and the water and sanitation systems that had been constructed in the 1990s and only covered about 50% of the population were out or order or abandoned. The IS intervention changed this completely, and by the end of the period the whole area had been provided with quality infrastructures, including the complete urbanization of the most critical areas. This has been verified by our research and is comprehensively recognized by the population.
    - The experience demonstrated the possibility of actually implementing inter-sector cooperation between different areas of government. It demanded bringing together a team of specialists and professionals that were committed to the principles and objectives of the project, and this was thoroughly achieved.
    - It also demonstrated the feasibility of inter-federative partnerships to tackle the problem of vulnerable communities, with the coordination of municipal, provincial and federal State agencies.
    - It also demonstrated the feasibility, desirability and necessity of introducing and sustaining direct democracy mechanisms to achieve the democratization of access and management of essential public services. These mechanisms provided meaningful opportunity for the participation of citizens-users, and contributed to their empowerment vis a vis powerful actors, such as the provincial water utility or the municipality, which had been historically reluctant to allow spaces of democratic engagement to the

poor and very poor, and have are not subject to public scrutiny and accountability in ways that allow common citizens to have a voice. This experience has left an imprint in the memory of the local community, which recognizes the advanced made in the democratization process during the implementation of the system.

- Although the original model of IS was progressively dismantled after 2005, until the time of writing this report in late 2015, the Municipality of Recife officially announces that the IS is the approach adopted for the provision of essential water and sanitation services in the city.

Weaknesses

- There are many lessons also regarding the failures, the obstacles that help to explain why the experience, in its full shape, did not last beyond the first 5 years and the most important mechanisms of democratization were progressively dismantled after that.
  - Although the experience demonstrated the feasibility, desirability and necessity of introducing and sustaining direct democracy mechanisms to achieve the democratization of access and management of essential public services, these did not last long. An important factor that helps to explain the failure is the uneasy relationship, tensions, and contradictions between electoral politics and the politics of substantial democratization. Instrumental decisions driven by the rationality of electoral politics may have been a major factor in allowing the introduction of the IS system in the first place, but it certainly was the key factor in the dismissal of the original project from 2005 and onwards.
  - Also, another factor are the inertial forces that prevent institutional change, in particular in relation to reforms geared at promoting inter-sector collaboration between different government areas (health, water and sanitation, planning, infrastructure, etc.).
  - Also, although the implementation of the IS system demonstrated the feasibility of inter-federative partnerships, these were weak from the start and did not last, especially in the relationship between the provincial and the municipal governments. It became clear that such partnerships require a substantially strong and sustained political will from all the parties, which is often difficult to achieve, particularly in a context of ever shifting political alliances and partisan interests such as the one characterizing current Brazilian politics.

Note: We discussed our findings for this case study with a number of experts, politicians, and practitioners, in addition to members of the beneficiary community, and received excellent and positive feedback approving the results. Among other key actors consulted were Eng. Marcos Montenegro, member of our Strategic Advisory Committee, who designed and implemented the early experiences with the IS system. Also, we worked closely with Antonio Miranda Neto, also a member of our Strategic Advisory Committee, who led the experience in Recife that was the subject of the study. We also interviewed Miranda Neto and invited both Montenegro and Miranda Neto to participate in several engagement and dissemination events (the relevant references to these activities are provided in the D3.2 and in the D5.2 reports).

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WP3.3 Community-Based Water Associations in Colombia's Rural Areas

WP3.3. studied the case of autonomous community management of a water supply and treatment system implemented since 1994 in the rural community of Mondomo. Mondomo has around 3400 people and is located in the municipality of Santander de Quilichao, Cauca Valley, Colombia.

Partner UNIVALLE is in charge of WP3.3. Some sections of the study, mostly about the policy-institutional context, were shared with WP2.4, which was also done by partner UNIVALLE.

This case used the same mixed methodology than WP2.4, with a highly participative approach involving the local community, including

a) Bibliographic research
b) Documentary research (mainly archives of the institutions involved in the intervention)
c) Secondary data from statistical sources (local, regional, national health authorities; planning authorities; municipalities involved)
d) Systematic analysis of press reports published between 1980 and 2014
e) Photographic and video archives with material from study area
f) Semi-structured interviews with relevant actors
g) Focus groups
h) Workshops
i) Participatory Rural Appraisal techniques, including participatory mapping/socio-environmental cartography
j) A survey with random systematic sampling
k) Geographical Information Systems (geo-referencing, characterization, and analysis)
l) Photographic record

Summary of study findings:

- The intervention in Mondomo was triggered by the destruction caused to the town's water supply infrastructure by an earthquake that happened on 6 June 1994 (measuring 6.4 in the Richter scale)
  - 20% of the town's houses suffered structural damage
- Around the time of the earthquake the community's water supply system presented serious deficiencies
  - the system lacked a proper office for administration and the attention of users
  - it was poorly equipped for operation and maintenance
  - the system had only two workers, a plumber and the treasurer, but there was no proper training of personnel
  - there was no institutional support (e.g. from the municipal WSS utility, EMQUILICHAO)
  - only 450 out of 535 users were properly registered, and the relationship between the utility and the users was very informal
  - there was no systematic record of activities
  - the official coverage was 96.3% but the service was intermittent and the quality of the water was compromised by faecal contamination
  - the rate of non-payment was around 45%
  - tariffs were not charged according to the existing legislation and were not regulated;
  - the tariffs were not sufficient for the financial sustainability of the system, which was in permanent deficit
  - the water supplied was used for domestic, commercial and small-industry consumption as well as agricultural uses;

    - there was a high level of waste owing the bad condition of the water network, and there was no culture of efficient water use
- In the immediate aftermath of the earthquake the population resorted to buy water from water trucks or fetch it from provisional wells
- A study done when the operation of the old system was re-established after the earthquake showed that
    - 45% of the population, located in the higher parts of the town, lacked access to the network
    - 75% of the population was affected by water-related diseases caused by the contamination of the water supply, mostly by domestic waste water
        - helminthiasis, acute respiratory infections, gastrointestinal diseases
        - among the main causes of child morbi-mortality were diarrhoeas, fungal infections, pneumonia, and insect bites
    - As a result, in 1995 Mondomo was declared in state of sanitary emergency.
- From a socio-cultural and political perspective, Mondomo has a strong tradition of participation in local development projects and recognized, long-term community leaders

Characteristics of the intervention studied (this section has similarities with WP2.4)

- In 1991, the CINARA Institute at UNIVALLE, with support from the Dutch government, participated in launching the Technology Transfer Programme for Water Supply Systems in the Republic of Colombia (TRANSCOL). TRANSCOL was developed on the basis of the Multi-Stage Filtration System, a technological innovation developed with the leadership of CINARA. The implementation of the Programme involved local, regional and national authorities with the active involvement of beneficiary communities in the process.
    - Among the methodologies used to promote the participation of the communities were household visits, women-only focus groups, formal and informal interviews, creative workshops involving oral communication, and artistic activities (painting, music, theatre, popular tales, etc.).
- As a result of the impact of the 1994 earthquake in Mondomo, the Business Permanent Committee of the Cauca Valley launched an initiative called “A Valley Solidary with Cauca”, seeking to channel economic resources to the zones affected
    - Mondomo was chosen because it was the only community that had not yet received any funding after the earthquake
    - The local community leaders requested unanimously that the help should be targeted to build the water supply system, which was the top priority for the people
    - The project to build a new water system (water network and potabilization plant) based on the Multi-Stage Filtration technology involved a partnership between local, regional, national and international actors from the private, public, and cooperation sectors.
    - The total cost of the project was 1,327,000 USD, 85% of which came from public funding.
    - The CINARA Institute at UNIVALLE was trusted with the role of process facilitator.

The system was eventually built and the evidence suggests that the project has achieved most of its objectives

- The case of Mondomo is considered a successful example of a community-managed, sustainable, ecologically friendly water supply system. It receives regular national and international visitors.

- Mondomo's community water utility has been a key actor in the creation of the Association of Community Organizations Providers of Public Water and Sanitation Services of Colombia (AQUACOL).
- It also plays an important role as a Community Centre for Learning about Water. These centres have the objective of sharing knowledge between community peers to strengthen capacities and promote empowerment of local leaders.

See also Summary of WP2-4 - Issues arising and Measures taken.

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3.2.2.5. Work Package 4. Intervention Cases

This WP's stated objective was to "Develop and implement sustainable, appropriate and innovative socio-technical interventions for the provision of safe WSS to vulnerable populations." The work involved three case studies, two of them in Brazil and one in Argentina, and the WP's period started in Month 3 and ended in Month 24. The designated lead partner in this WP was UNR jointly with UFMG, with the methodological support of UNEW and IMAR-UC. As explained in the Summary of WP2-4 - Issues arising and Measures taken, the Project Coordinator had to take over the co-ordination, as partners UNR and UFMG were unable to perform this role.

This WP was centred on simultaneously studying and delivering actual **interventions** during the project's life. The three case studies were:

WP4.1 Participative Generation of a Water Treatment System in a Quilombola Community in Minas Gerais, Brazil, by partner UFMG

WP4.2 Community Oriented Water and Sanitation System in a Rural Community in North East Brazil, by partner UFMG

WP4.3 Capacity Building for Monitoring Water Quality in Vulnerable Communities in Argentina, by partner UNR

WP4.1 and WP4.2 **involved the construction of infrastructure**, while WP4.3 was an intervention focused on **capacity building activities with local schools**.

This WP had three deliverables expected in this reporting period:

D4.1 Appropriate water technologies in an agrarian reform settlement in Minas Gerais: Final Report
D4.2 A community oriented water and sanitation system in rural North East Brazil: Final Report
D4.3 Capacity building for monitoring water quality in vulnerable communities in Argentina: Final Report

There were no milestones in this reporting period.

3.2.2.5.1. Summary of progress towards objectives and results

Overall, for this WP we achieved our objectives including the completion of expected results for this reporting period. The Final Reports for WP4 were successfully submitted, although most partners in charge of the reports experienced delays.

We consider below the details for each separate case study.

WP4.1 Participative Generation of a Water Treatment System in a Quilombola Community in Minas Gerais, Brazil

WP4.1 studied the implementation of a water treatment system in the rural community of Lagedo, in northern Minas Gerais. Partner UFMG was in charge of this case, in partnership with Brazil's National Health Foundation (FUNASA).

The main objectives of this intervention were:

- Designing, constructing, monitoring and assessing the results of a simplified treatment system for water with high turbidity, which can be used by small rural communities;
- Assessing the system's efficiency for pre-treatment, treatment and disinfection;
- Training community members for the adequate management and operation of the system;
- Monitoring and assessing the level of acceptance and appropriation of the system by the local community, to ascertain its potential sustainability.

This case study used mixed methods with a strong emphasis on participative activities as it engages a range of non-academic actors in all stages of the research process. In particular, it involved local families in Lagedo as co-researchers.

The main sources of evidence for this case were

a) bibliographic research;
b) documentary material from archives;
c) secondary data from statistical sources;
d) Participatory Rural Appraisal and other participatory techniques, including
    i. Participatory mapping
    ii. Seasonal calendars
    iii. Territorial recognition through transects and crossings
        - For instance to reconstruct the community's "water paths", from the water collection point to the moment of consumption, to identify types and sources of water pollution along the path;
    iv. Systematic recording of daily routines of community members
        - For instance to identify forms of domestic water use and understandings of the relationship that community members have with water
    v. participant observation
    vi. workshops
e) semi-structured interviews
f) questionnaires
g) institutional diagrams
h) collection and analysis of water samples
i) relative-value scale analysis
j) fluxograms of impact
k) evaluation matrix
l) experimental (laboratory based) and in situ implementation of the treatment system
m) photographic record.

Among the main findings of the study, we want to highlight:

- Lagedo community is located in the municipality of São Francisco, northern Minas Gerais. It has currently 36 families;
- Lagedo is part of Quilombo Jardim da Prata, and is one of about 500 Quilombola communities existing in the state of Minas Gerais
    - Quilombola communities were originally constituted by runaway slaves, although today the population can be mixed and not limited to slave descendants;
    - These communities are among the most deprived and marginalized in Brazil;
- Like in most Quilombola communities, a major problem is the lack of land titles, which is one of the main objects of social and political struggle
    - The lack of land titles determines that public utilities are not obliged to provide essential services like WSS to rural or informal urban communities
- Lagedo is surrounded by three rivers: São Francisco, Pardo, and Riacho
    - These rivers are the main source of water
    - The quality of this water is highly variable
- The soil and water are subject to pollution from several sources:
    - a study carried out in 2013 in the community found that there is still open defecation in Lagedo
    - agricultural activities in the community show an uncontrolled use of agrochemicals
    - official and other reports on the quality of the river water (especially the largest river, the São Francisco River), show very high levels of biological and industrial pollution;
- In addition to the lack of safe WSS services, there are no health agents in Lagedo and the nearest health centre is several hours away and it is difficult to reach during part of the year
- The communities have developed their own systems of water supply, for instance through wells drilled near the river margins to induce self-filtration from the river into the well (we call it filtration in the margin) or shallow ponds;
- We observed that the wells and small ponds built by the community have technical and safety problems
    - Most of these systems do not have proper protection (covers, edges, etc.)
    - This suggests lack of planning and technical support, although some of these systems were built with support from external agents
    - A municipal councillor built a well during an election campaign; he did it with neither planning and technical design nor discussion or consultation with the community
        - The water of the well was useless for human consumption
        - In reaction the community built a direct water intake from the São Francisco River, a 10 thousand-litre storage tank, and an improvised small network to connect some of the houses; this water is consumed untreated and mostly unfiltered;
- The intervention involved:
    - Pre-treatment – raw filtering through wells built in the margin of the river
    - Treatment – slow filtering, where we experiment with three different filtering materials
        - Sand
        - Sand mixed with synthetic materials

        - Synthetic materials
    - Disinfection – we prioritized solar-energy disinfection techniques (we tested glass and aluminium water containers) but had conventional chlorine as a backup option
        - The chlorine option may be resisted by the community as we identified communities that do not accept the taste of chlorine in the water
- One of the problems facing the intervention was that the small number of families of the community (36) are scattered in the territory, which makes difficult to provide water to all of them with a single system;
- Another issue is that we succeeded in engaging members of the community in the process as well as all relevant external actors, including social movements and local, regional and federal authorities; however, a major obstacle has been the reluctance (or lack of capacity) of technical actors from public authorities to engage in meaningful interaction with the local community.
- The approach adopted for the research, based on the co-production of knowledge with community members, helped to raise awareness in the community about the quality of the different water sources in use, and to empower them to understand the methods used to evaluate water quality and the operation of the systems implemented by the authorities to provide safe drinking water.

* * *

WP4.2 Community Oriented Water and Sanitation System in a Rural Community in North East Brazil

WP4.2 formed part of three case studies focused on the experience of the Integrated Rural Sanitation System (SISAR) implemented by our partner CAGECE in the state of Ceará, Brazil. The other two cases covering SISAR are WP2.1 and WP3.1. WP4.2 was focused on the implementation of a SISAR system being built in the community of Cristais, and carried out a comparative study with the situation of the communities of Arataca, Andreza and Itapeim, which we refer to as the "Itapeim Agglomeration". The Itapeim Agglomeration has a SISAR system that had been in place for over a year when our study was started, and we used it as a control site. Cristais is located in the Fortaleza Metropolitan Area, which competes with Recife to be the fifth largest urban concentration in Brazil.

We designed these three studies to cover different angles of the SISAR, and we treated them as an integrated study. Therefore, the three reports are complementary, although they may have overlapping content.

Partner UFMG with the participation of partner CAGECE was in charge of all three cases.

This case involved **an intervention consisting in the provision of basic sanitation infrastructure**, which was built by our partner CAGECE. Our study **focused on the health impact on this intervention** (note that this was not a demonstration case).

This case used mainly quantitative methods to assess the health **impact of the intervention**, whose details we repeat here:

- The system built provides both water and sewerage, which is a novelty as the local SISAR did not have prior expertise in sewerage management;
- All 345 households in Cristais were connected to the water supply
- 290 households were fitted with toilets and showers.

The study focused on two moments: 1) before the construction of the system (data collection already completed and under analysis), and 2) after the completion of the system (ongoing).

The main sources of evidence were

a) A questionnaire applied to the universe of the sites
    i. in two different moments (replicated)
    ii. in Cristais, where the intervention took place, and in the Itapeim Agglomeration as control case
b) water quality analyses
c) a longitudinal epidemiological study of children under 5 years old
    i. anthropometric measurements
    ii. analyses of faecal samples
d) an Intermittency calendar
    i. A tool created by our partner UFMG, where members of the community identify hours along the day when there is no water supply of any kind.
e) Photographic record

Among the key indicators that we looked at were:

- General conditions of children under 5 years old
    - Prevalence of diarrhoea and parasitosis;
    - Nutritional conditions;
- Bacterial contamination of domestic water storage in houses with children
- Water-related hygienic habits (drinking, cooking, washing food and kitchen instruments, laundry, gardening, etc.)
- Availability, reliability, quantity, and quality of the water supplied.

Summary of study findings:

- Both in Cristais and in the Itapeim complex, we detected a low water consumption per capita. However, the problem was more pronounced in the community without the networked water supply.
- Despite the significantly greater per capita consumption in the community with a SISAR-managed water supply system, the benefits could be greatly improved by installing residential sanitary facilities in all households and by providing more support to community users about understand how the newly introduced metering and billing system work
- In both communities, there are households that spend over 3% of their family income in the water bill, higher than the conventionally recommended value. Notably, the community of Cristais has the largest proportion of families paying over 3% of their family income.
    - This suggests that there is a need to review the billing system, particularly to avoid place families on very low incomes at a disadvantage
    - We also noticed that despite being now connected to the network, many families continue to use rainwater for many of their needs, including drinking, cooking, and hygiene
- The sole fitting of toilets does not guarantee that this infrastructure will be used. We detected a group of households where despite being fitted with toilets family members continued to practice open defecation.
- Despite the fact that the introduction of networked water is an advance for the rural community studied, additional measures will be needed to ensure that water provision

meets the UN's criteria for the human right to water recently adopted by the Brazilian government.

- Our research results suggest that in addition to building physical infrastructures, there is a need to coordinate actions with the public health agents operating in the communities to achieve better results in relation to
    - Levels of parasitological contamination
    - Incidence of Diarrhoea
    - Nutritional standards as set by the World Health Organization
- SISAR's innovative management system that promotes empowerment through community participation can be an important factor in guaranteeing the adhesion of those communities that remain unserved. From a collective health perspective, the universalisation access to drinking water through SISAR could be determinant for the successful promotion of adequate health and sanitary standards.
- As a warning, in spite of its attempts to empower communities, SISAR does not yet attempt to work in coordination with other key actors such as Community Health Agents and Epidemiological Agents. More coordinated action could contribute to improved local participation and, to making SISAR's measures more effective.

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WP4.3 Capacity Building for Monitoring Water Quality in Vulnerable Communities in Argentina

WP4.3 was an intervention involving work with teachers and students in secondary schools from five communities located in the Lower Carcarañá River and Colastiné Stream basins, Province of Santa Fe, Argentina. The localities are Coronda, La Chispa, San Francisco, Carcarañá, and Cañada de Gómez. Partner UNR was in charge of this case.

The main objectives of this intervention were:

- Developing tools for encouraging the local population to exercise a fuller control over the quality of community life.
    - Promoting the engagement of local communities in the diagnostic, explanation, and search for solutions to water-related impacts on human health and wellbeing by facilitating access to basic knowledge about, among other,
        - Water quality indicators and techniques for their measurement
        - Normative requirements for water quality
        - The impact of water quality problems on public health
        - The relationship between water consumption habits and levels of exposure to pollutants;
- Developing a methodology for the joint work of specialists and community members
    - Contributing to the transformation of the social relations between these actors (specialists and common people) that are conventionally mediated and over determined by technology;
    - Identifying elements and factors that favour the configuration of social networks for the production and transfer of knowledge between academic and non-academic actors and institutions; de-monopolizing the social control of such knowledge
- Raising community awareness about the nature and causes of such water-related impacts

- Targeting secondary school children as key actors in the process of enhancing knowledge and raising community awareness in relation to such water-related impacts;
- Training secondary school teachers and students to master basic scientific experimentation and analysis to produce diagnoses and explanations of the quality of the water environment and of the water supplied for domestic use in their communities;
- Producing knowledge about the causes of such water-related impacts that can provide a sound basis for public policy design and implementation to tackle the situation.

This case study used mixed methods, adopts a comparative approach, and emphasised participative activities. The main sources of evidence for this case were

a) bibliographic research;
b) Secondary data from statistical sources (local, regional, national)
c) systematic analysis of press reports from Santa Fe Province;
d) a questionnaire, applied in 3 communities
e) in-depth, semi-structured interviews
f) workshops with school teachers, students, and their families
g) fieldwork visits with school teachers, students, and specialists
h) basic laboratory work with school teachers and students
i) Geographical Information Systems (geo-referencing, characterization, and analysis)
j) analysis of satellite images complemented with photography
k) analysis of water samples
l) photographic record.

Findings:

<u>General context</u>

- We chose these five localities (Coronda, La Chispa, San Francisco, Carcarañá, and Cañada de Gómez) because although they share the same geographical and environmental characteristics, they are highly diverse in a number of aspects, which suits our comparative approach, among other:
    - in terms of population size their range from
        - just under 30 thousand people (Cañada de Gómez)
        - to less than 300 (San Francisco)
    - in terms of type of provider of basic water services
        - Coronda and Carcarañá's water supply systems are in hands of local cooperatives;
        - Cañada de Gómez is served by the provincial utility Aguas Santafesinas (ASSA);
        - La Chispa and San Francisco lack formal water and sanitation systems;
    - In terms of water source
        - Coronda uses surface water from the Coronda River
        - Carcarañá and Cañada de Gómez rely on underground water
        - La Chispa and San Francisco resort to a range of sources
- Santa Fe is one the richest provinces in Argentina. However, the situation of basic water services is a concern
    - 85% of the provincial population is connected to the water network
        - breaking down this 85%:

        - only 67% receives potable water;
        - 10% receives water of regular quality
        - the remaining 8% receives water of inacceptable quality
    - 15% is not connected to networked systems and relies on sources that are often uncontrolled;
- A large number of communities in Santa Fe receive water from sources that are highly affected by natural or anthropogenic pollution with toxic substances that have a negative impact on human health and wellbeing;
    - A 2007 study by the provincial government reported that 85 localities, over 23% of the total 362 localities of the province, have their water sources affected by levels of arsenic and fluoride substantially higher than the maximum recommended by the World Health Organization;
        - The currently recommended WHO value is 10 μg/litre, and these localities can have between 50-100 μg/litre;
        - These are mostly small localities served by local authorities or cooperatives or where people have to resort to wells and unprotected sources;
    - The provincial government passed new laws and regulation to tackle the problem by making small utilities to invest in more advanced filtering technologies (e.g. inverse osmosis), but this had little success so far;
        - The main reason is the high costs of these technologies that are unaffordable for small communities.
    - Santa Fe has been historically a major producer of industrialized agriculture. In recent years, the province has been at the forefront of the so-called revolution of genetically modified crop production, particularly Soybeans, which rely on intensive use of agrochemicals
        - There is scant reliable official information about the impact of agrochemicals on the local environment, but there is substantial emerging evidence, particularly from local rural and semi-rural communities affected by the intensive use of these chemicals and also from ongoing research. Communities are increasingly aware of these problems, but do not have reliable information to act;
- We succeeded in engaging secondary schools in all five communities and worked closely and regularly with teachers, school children, and their families
    - We carried out an assessment, jointly with these actors, about:
        - existing knowledge and perceptions about
            - Water sources used by the community
            - The quality of these water sources
            - Quantity and types of domestic water use
            - Natural and anthropogenic drivers of water pollution and their impact
            - Water related diseases
        - We trained secondary school teachers and students from the communities in basic techniques to examine water quality (in the source, at home, etc.), both through field and laboratory work
        - We also trained the students in the application of simple questionnaires and applied these to a sample of households in their communities
            - We jointly analysed and discussed the results of the questionnaires
    - We also conducted semi-structured interviews with local and provincial authorities, including water utilities and regulators
    - We completed an analysis of press reports on water-related conflicts in the region

- Also, we mapped potential sources of water contamination (mostly agricultural sources) with the use of satellite images, GIS, and our own photographic records

See also Summary of WP2-4 - Issues arising and Measures taken.

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3.2.2.6. Summary for WP2-4 - Issues arising and Measures taken

Here we provide a brief summary of key points related to the progress of our ten case studies, in some cases adding information for clarification.

We include regular reports on the work done for our case studies in our quarterly Newsletter, which is published in English, Portuguese, and Spanish.

Work Package 2 - Historical Cases

The designated lead partner in this WP was UFRJ, with the methodological support of UNEW and IMAR-UC. Owing to unforeseen circumstances partner UFRJ was unable to perform this role, which was taken over by the Project Coordinator.

WP2.1 Political-Institutional Assessment of SISAR in (Ceará) Northeast Brazil, by partner UFMG

The deliverable D2.1 corresponding to this WP was submitted with some delay, which was a problem common to all other case study reports. Unfortunately, this cause delays in the start of the work of WP5, which depended on the submission of the case study reports.

Although there were no significant modifications from the preliminary findings submitted for WP2.1 in Periodic Report 1, a number of disagreements with some of these findings and their dissemination through DESAFIO's Newsletter Nº 5, were raised by partner CAGECE in May 2015, during Reporting Period 2. As partner CAGECE is in charge of the SISAR system under study, they became uncomfortable with some of the conclusions and with the wording of the findings included in Periodic Report 1 and with the synthesis of these findings published in Newsletter Nº 5, although the matter had not been raised during the discussions of these same findings held by all partners in August 2014 during the Second Project Meeting. The disagreements, although for different reasons, concerned all three reports produced by the case studies related to SISAR (WP2.1, WP3.1, WP4.2). The Project Co-ordinator organized a joint virtual meeting with partners UFMG and CAGECE to find a solution to the disagreements. He also gave space to CAGECE's representatives in Newsletter Nº 6, where Helder Cortez, CAGECE's Rural Sanitation Manager, published a short report presenting the public utility's institutional perspective on the SISAR system. In addition, the Project Co-ordinator allocated enough time to CAGECE's representatives in DESAFIO's Second International Conference on 27-28 July 2015 to allow them to present the case of SISAR in their own terms. They were allocated time in two sessions: Helder Cortez, CAGECE's Rural Sanitation Manager, participated in Panel 2 "In search of synergies for change: factors, conditions and processes that help to explain how the innovations emerged". Also, Claudia Valeria Silva Melo, CAGECE's Social Assistant supporting the SISAR project, participated in Panel 3. "The 'why'. Factors and processes, and facilitators and obstacles that help explain the successes, failures and the possibility of replicating the innovations". Moreover, the matter was discussed in some depth at the Third Project Meeting that took place after the Conference on 29-31 July 2015. At this meeting, partners UFMG and CAGECE agreed that a representation of CAGECE would visit UFMG during August to jointly review all three case-study reports and come to an agreement regarding the final text. This meeting took place in August 2015, after which partner UFMG produced revised versions of the three reports, which were submitted to the Project Co-ordinator during September 2015.

In parallel to the revisions of the reports, the Project Co-ordinator promoted a more active participation of CAGECE in presenting their own version of SISAR, given that in his personal assessment of the matter several disagreements had not been fully resolved. This included the participation of CAGECE's representatives in the self-funded post-project Seminar on Democratization of the politics of basic sanitation services through socio-technical innovations. Lessons to tackle the challenges, held in Recife on 19 August 2015, where Otaciana Ribeiro Alves, CAGECE's newly appointed Rural Sanitation Manager participated in "Round Table 1 – Obstacles and facilitators of the democratization process of the politics and management of basic sanitation". Also, Marcondes Sobreira from CAGECE participated in "Round Table 2 – Lessons from the experiences studied: the findings in context, Part 1 – Lessons from the Project: rural sanitation", during the self-funded post-project Seminar Materializing the Right to Water and Basic Sanitation Services, that took place in Brasilia on 9 September 2015.

In addition, the Project Co-ordinator took offline Newsletter Nº 5 in order to review the original text after the revisions made to the three case-study reports and the ongoing discussions with partner CAGECE.

The Project Co-ordinator has also invited CAGECE to actively participate in post-project dissemination and publications activities, to ensure that even if the disagreements cannot be fully resolved, there is enough opportunity for CAGECE to have their views and interpretations appropriately represented.

WP2.2 The Condominial Sanitation System in Zones of Special Social Interest (ZEIS) in Recife, Brazil, by partner UFPE

No major issues emerged in this case. There were delays in the submission of the final D2.2 report owing to unforeseen circumstances affecting some of the local researchers, but these did not affect the completion of the research work. Like in all other case-study reports, the delay affected the start of WP5.

WP2.3 Assessment of Appropriate WSS Technologies in Vulnerable Communities in the Baixada Fluminense, Rio de Janeiro, Brazil, by partner UFRJ

No major issues emerged in this case. There were delays in the submission of the final D2.3 report owing to unforeseen circumstances affecting some of the local researchers, but these did not affect the completion of the research work. Like in all other case-study reports, the delay affected the start of WP5.

WP2.4 Empowerment, Resilience and Sustainability: Evaluation of an Integrated Water and Sanitation System in a Rural Community in (Cauca Valley) Colombia, by partner UNIVALLE

No major issues emerged in this case. There were delays in the submission of the final D2.4 report owing to unforeseen circumstances affecting some of the local researchers, but these did not affect the completion of the research work. Like in all other case-study reports, the delay affected the start of WP5.

Work Package 3 - Current Cases

WP3.1 Ethnographic Assessment of SISAR in (Ceara) Northeast Brazil, by partner UFMG

This particular case study was affected from the start by various difficulties. Firstly, partner UFMG had requested during the Second Project Meeting that took place in August 2014 the change of this particular case from WP3 to WP4. The change was discussed with and approved by the UE officer shortly afterwards. However, eventually partner UFMG decided that the change was not worth and the original plan as laid out in Annex I was maintained (and the UE officer correspondingly notified of this decision). Secondly, and more importantly, there were problems with the composition of the research team, part of which operated at a long distance from the case co-ordinator at UFMG (Belo Horizonte, where partner UFMG is located, is at over 2500km from Fortaleza, the location of CAGECE's headquarters in the state of Ceara, Brazil). At the beginning of the project UFMG hired a local researcher in Ceara, but eventually he had to be replaced during Reporting Period 2 owing to a number of unforeseen problems. Eventually, the researcher was replaced, but this lead to a significant change in the theoretical and methodological approach and also the site for the case was changed. In consequence, the final report does not follow from the preliminary report discussed during the Second Project Meeting. Despite these significant alterations of the original plan, the final D3.1report made a contribution in line with the overall expectations for this WP.

Like in all other cases, there was a delay on the submission of this report, which affected the start of WP5.

D3.1, jointly with D2.1 and D4.2, became the centre of attention in the disagreement raised by partner CAGECE already discussed in the previous section.

WP3.2 Socio-Technical Dimensions of the 'Integrated Sanitation' System in Low-Income Neighbourhoods in Recife, Brazil, by partner UFPE

No major issues emerged in this case. There were delays in the submission of the final D3.2 report owing to unforeseen circumstances affecting some of the local researchers, but these did not affect the completion of the research work. Like in all other case-study reports, the delay affected the start of WP5.

WP3.3 Community-Based Water Associations in Colombia's Rural Areas, by partner UNIVALLE

No major issues emerged in this case. There were delays in the submission of the final D3.3 report owing to unforeseen circumstances affecting some of the local researchers, but these did not affect the completion of the research work. Like in all other case-study reports, the delay affected the start of WP5.

Work Package 4 - Intervention Cases

The designated lead partner in this WP was UNR jointly with UFMG, with the methodological support of UNEW and IMAR-UC. Owing to unforeseen circumstances partners UNR and UFMG were unable to perform this role, which was taken over by the Project Coordinator.

WP4.1 Participative Generation of a Water Treatment System in a Quilombola Community in Minas Gerais, Brazil, by partner UFMG

Issues that were already mentioned in Periodic Report 1 had an impact on the completion of this report:

- The chosen case is located in a remote area (a difficult 4-5 hour drive from Belo Horizonte, where UFMG is located) which remains inaccessible during part of the year owing to heavy rain. This has caused some delays and logistic problems;
- There was a significant delay in the implementation of the physical infrastructure. The delay was due to bureaucratic problems in the National Health Foundation (FUNASA), which funds the physical intervention.

In addition, after the Second Project Meeting that took place in August 2014 the main researcher in charge of the filed work had a serious health problem that prevented him from carrying out the work during several months.

As a result, D4.1 also experienced serious delays, that affected among other things the start of WP5, but was eventually submitted with success.

WP4.2 Community Oriented Water and Sanitation System in a Rural Community in North East Brazil, by partner UFMG with participation of partner CAGECE

Issues that were already mentioned in Periodic Report 1 had an impact on the completion of this report:

- The original site chosen for this case was found to be unsuitable for the study. This situation caused a delay, as the research partner needed to carry out an exploration to find a suitable replacement. This was finally resolved and the case was put back on track, but the delay had an long-term impact of the field work.
- There was an additional delay because partner CAGECE, in charge of the physical infrastructure, suffered significant delays owing to bureaucratic problems with the financing of the works. The project was eventually completed, but the delay affected the field work and the completion of the final report.

As a result, D4.2 also experienced serious delays, that affected among other things the start of WP5, but was eventually submitted with success.

D4.2, jointly with D2.1 and D3.1, became the centre of attention in the disagreement raised by partner CAGECE already discussed earlier.

WP4.3 Capacity Building for Monitoring Water Quality in Vulnerable Communities in Argentina, by partner UNR

Issues that were already mentioned in Periodic Report 1 had an impact on the completion of this report:

- The social science component of the research team suffered several setbacks, sadly including the passing away of Prof. Juan Carlos Marín, who was providing research support. This caused delays in the development of the social-science components of the case study.

As a result, D4.3 also experienced delays that affected among other things the start of WP5, but was eventually submitted with success.

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3.2.2.7. Work Package 5. Cross comparative analysis of assessment and intervention cases

This WP's stated objective was to "Elaborate a systematic comparative analysis of the results and findings emerging from the assessment of existing experiences and the newly developed interventions" covered in the ten case studies. The WP's period started in Month 22 and ended in Month 28. The designated lead partner in this WP was UFMG, co-led with UNEW and with the support of all partners. As explained below in "Issues arising and Measures taken", the Project Coordinator had to take over the co-ordination, with the support of partner IMAR-UC.

This WP was centred on developing a holistic and comprehensive assessment of the case study findings with reference to the six analytical dimensions at the core of the project: socio-political and cultural, economic-financial, health, ecological-environmental, techno-infrastructural/operational, and policy-institutional. The WP had to main tasks:

Task 1. Case studies: WP participants will produce the inputs from their case studies. The WP leaders will circulate a first draft of the integrated cross comparative analysis to be commented by the participants including the stakeholders. This will take the form of an electronic conference organised by the WPL (Work Package Leaders).

Task 2. Country studies within the Latin American context: In each country the partners will produce an analysis framing the results from DESAFIO within the policy and practice of the country. The WPL and UNEW will produce the final comparison of the experiences in Brazil, Colombia and Argentina within the general context of Latin American experiences.

This WP had two deliverables expected in this reporting period:

D5.1 Cross comparative analysis of case studies
D5.2 Cross comparative analysis of country practices within the Latin American context

There was one milestone in this reporting period:

MS12 Electronic Conference Report

3.2.2.7.1. Summary of progress towards objectives and results

The work was completed and submitted according to the objectives. As explained in the discussion of previous WPs, we were not able to cover all six analytical dimensions of the study with the same depth in all case studies. Particularly, the ecological-environmental dimension and the economic-financial dimensions received less attention across the cases, with some exceptions. This was reflected particularly in report D5.1, which highlighted the main gaps in this regard.

However, both deliverables D5.1 and D5.2 addressed the project's key research questions in the comparative analytical framework envisaged for this WP. We do not reproduce here the key findings to avoid repetition with other sections, particularly WP6.

The Final Reports for WP5 were successfully submitted.

The MS12 milestone was overridden by the circumstances explained below, but its objective was achieved by compensatory measures.

3.2.2.7.2. Issues arising and Measures taken

The work of WP5 was affected by a number of emerging issues.

Firstly, the delays affecting all case study reports already discussed in the previous sections posed severe stress on WP5, which could not properly start until all final case study reports were submitted. In practice the work did start earlier, on the basis of the preliminary reports submitted at the end of Reporting Period 1, but a number of changes in some case studies, some of them relatively significant as already discussed, meant that the work for WP5 suffered important delays.

Secondly, we could not follow the original plan envisaging that the work for WP5 would be co-developed with the Work Package Leaders (WPL). As explained before, several WPL could not fulfil their roles for a range of circumstances, and in all these cases the Project Co-ordinator had to take over their role as WPL. This severely limited the interaction between the partners for the work required in WP5. This was compounded by the fact that most partners were fully immersed in completing the revisions and final reporting for the case studies, some of which were submitted well after the original deadlines, which left little time for them to engage in the work of WP5. Thus, although during the Second Project Meeting that took place in August 2014 the partners had set in place a team to co-ordinate the work of WP5, in practice the responsibility remained with the Project Co-ordinator in co-ordination with partner IMAR-UC. The MS12 envisaged an Electronic Conference to discuss the work of WP5, but in practice all the virtual meetings held by the partners after the Second Project Meeting that took place in August 2014 were taken over by the discussion of the case study reports whose completion took longer than originally planned, leaving little time for consideration of WP5.

In anticipation of these problems, at the Second Project Meeting the Project Co-ordinator had set a Plan B consisting on co-developing the work of WP5 with partner IMAR-UC in case that the original plans could not be followed. In January 2015, the Project Co-ordinator had a face-to-face weeklong meeting with partner IMAR-UC in Coimbra, Portugal, to discuss the work of WP5. This eventually proved to be the right strategy, as it allowed the completion of the two deliverables expected for this WP, with IMAR-UC taking full responsibility for D5.1.

3.2.2.8. Work Package 6. Final synthesis, policy recommendations and identified future research needs

This WP's stated objective was to "Produce guidelines for the design and implementation of sustainable, appropriate and innovative socio-technical solutions for the provision of safe WSS in vulnerable communities." The WP's period started in Month 26 and ended in Month 30. The designated lead partner in this WP was UNEW and with the support of all partners.

This WP focused on identifying the conditions and requirements for promoting sustainable, appropriate and innovative socio-technical solutions for the provision of safe WSS in vulnerable communities, based on the principles of good governance, substantive democracy and proactive citizenship. It also aimed to identify needs and opportunities for further research emerging from the project work.

This WP had three deliverables expected in this reporting period:

D6.1 Socio-technical solutions for the provision of safe WSS in vulnerable communities: a synthesis
D6.2 National, regional and EU policy guidelines for the provision of innovative WSS
D6.3 Recommendations for future research

There were no milestones for this WP.

3.2.2.8.1. Summary of progress towards objectives and results

We completed and submitted all three deliverables for this WP according to plan. D6.1 provides a synthetic overview of the project and its key results and findings. D6.2 offers policy guidelines and recommendations derived from the project findings, which we hope will provide timely advice for policy designers, decision makers, and implementers given that DESAFIO's results make a contribution towards the elaboration of public policies related the Sustainable Development Goals (SDGs) adopted in September 2015 with a deadline for 2030. D6.3 contains suggestions for further research related to research gaps that we identified in our work for DESAFIO.

3.2.2.8.2. Issues arising and Measures taken

For reasons discussed in the management section the lead partner for this WP became heavily overloaded in PR2, which created significant difficulties to complete the work for WP6 within the formal time schedule. Eventually the work was successfully completed.

3.2.2.9. Work Package 7. Engagement and Dissemination

Objectives for WP7: Implement a comprehensive programme of engagement and dissemination of the project's results.

WP7 period: Month 1 to Month 30
Deliverables expected for the reporting period:

D7.4 Electronic newsletter	Month 28
D7.5 Proceedings	Month 30
D7.6 Policy Briefs	Month 30

Milestones for the reporting period:

MS15 Stakeholder Meeting 2: Month 30

3.2.2.9.1. Summary of progress towards objectives, details for each task, and results

We succeeded in submitting the expected deliverables and meeting the milestone for the period (some deliverables had been anticipated for Reporting Period 1, and were included in Periodic Report 1). The team gave top priority to the activities of engagement, dissemination and impact generation envisaged in this WP, and has been able to implement a comprehensive programme that included the addition of several new products, as detailed below.

MS15 Stakeholder Meeting 2: Month 30

We met this milestone with a range of activities developed with stakeholders, prior, during and after the Third Project Meeting that took place in Rio de Janeiro on 27-31 July 2015 (including the Second International Conference). These activities will be reported through our project's Newsletter, the meetings playlist in our YouTube channel, and our Flickr photostream.

- Prior to the Third Project Meeting, on Saturday 25 July 2015, the Project Co-ordinator held several meetings with local stakeholders in the Baixada Fluminense area of Rio de Janeiro. These activities were organized by the organizations Pastoral da Terra (Catholic Church), the Forum of People Affected by the Oil and Petrochemical Industries near Guanabara Bay (Forum dos Atingidos pela Indústria do Petróleo e Petroquímica nas Cercanias da Baia de Guanabara), and the Pro-sanitation Movement of the Araruama Park Region (Movimento Pró Saneamento e Meio Ambiente da Região do Parque Araruama), from the São João de Meriti neighbourhood, Rio de Janeiro. The activities consisted in field visits and several short meetings in different locations.
- During the Third Project Meeting, the Project-Co-ordinator co-organized a field visit of DESAFIO's partners to the Baixada Fluminense jointly with the same civil society organizations, with support from the local partner UFRJ. We already produced a short video of this visit featured in our YouTube channel. Representatives of these communities participated actively in the Second International Conference, which is recorded in our videos of the event, also available in the meetings playlist in our YouTube channel. Also, we actively involved in the Second International Conference members of our Strategic

Advisory Committee and of our Local Case Study Advisory Committee for case study D2.3, which focused on the Baixada Fluminense region of Rio de Janeiro.

- After the Third Project Meeting, we held a number of activities with our stakeholders in Brazil, with whom we organized two post-project meetings reported below. These activities were co-organized with members of our Strategic Advisory Committee and of our Local Case Study Advisory Committee for the case studies D2.2 and D3.2 that focused on the experience of Recife, Brazil.

Deliverables:

- **D7.1 – Strategic Plan**. This deliverable was submitted as expected in Reporting Period 1 but we updated it regularly to include new activities during the project period.
- **D7.2 – Web site**. We kept it up to date, including full information about all project meetings.
  - We continued to develop a Multi-media Gallery, which includes a Flickr photostream with almost 900 pictures of the project (until October 2015) and two YouTube channel playlists (meetings playlist and interviews playlist) featuring 46 videos (until October 2015.
  - We will keep this website open and update the information, with the support of the WATERLAT-GOBACIT Network as originally envisaged.
- **D7.4 Electronic Newsletter.** Our Newsletter is produced quarterly, in English, Portuguese, and Spanish. It can be accessed in the project's web site, also under Documents. We have used the Newsletter to report on the progress of our research activities and have also added some features like short articles and special interviews directed at policy makers, experts, practitioners, etc. We will complete final editions of the Newsletter after the submission of all project reports.
- **D7.5 Proceedings**. We produced the first proceedings during Reporting Period 1, but have also added additional proceedings not included in the original plan as set in Annex I (see below "additional deliverables). The original proceedings expected for this deliverable related to the final project event, that included the project's Second International Conference that took place on 27-28 July 2015 in Rio de Janeiro.:
- **D7.6 Dissemination Policy Briefs.** We produced two Policy Briefs within the project's life, in English, Portuguese, and Spanish, and will complete a number of post-project Policy Briefs as part of our activities of post-project engagement and dissemination. The Policy Briefs can be accessed in the project's web site, under Documents.

Additional deliverables

We had already produced additional deliverables to those agreed in Annex I during Reporting Period I (recalled and updated here for convenience):

- **First International Conference**. We decided to take advantage of our First/Inception Meeting and organized the project's **First International Conference**, which took place in Recife on 25 February 2013. We produced a detailed account of the Conference in our first Newsletter and our Multi-media Gallery features images of the meeting. The event helped us to kick start the project

hitting several targets at once and delivering a range of important products, including:

- **High-impact engagement and dissemination.** Our local partners at UFPE, in charge of our First/Inception Meeting, took responsibility for the Conference jointly with the Project Coordinator. The event was designed to contribute to the local debate about WSS taking place in the city of Recife, which is the site our case studies WP2.2 and WP3.2.
- We involved in the organization and running of the event a range of actors:
  - The Brazilian members of our Strategic Advisory Committee (See Strategic Advisory Committee), which includes the person who was responsible for the introduction and implementation of the Integrated Sanitation system studied in WP3.2.
  - Our local Case Study Advisory Committee (see Case Study Advisory Committees) for our case studies WP2.2 and WP3.2, which includes members of Mustardinha community, the site of our two cases studies, members of neighbouring communities that have similar experiences, and representatives of NGOs, social movements, and academy;
  - Local and provincial authorities at different levels; both the Government of the State of Pernambuco and the Municipality of Recife gave support for our event, which included covering all additional costs (not included in our budget) such as
    - the provision of interpretation (Portuguese to Spanish and English, and from Spanish and English into Portuguese)
    - voice recording and transcription of the proceedings
    - breakfast, lunch, and coffee/refreshments for breaks for around 400 participants;
  - The French Consulate in Recife also provided logistic support for the event, which we requested as we invited Dr. Anne le Strat, Head of Eau de Paris, Paris's public water utility, to deliver a special speech to present the recent experience of the city. Her visit derived in an interview with the Mayor of Recife, Mr Geraldo Julio, and discussion of plans for a Cooperation Agreement between the cities of Paris and Recife, including the creation of a citizen's Observatory of Public Services in Recife, similar to the experience recently introduced in Paris.
  - Experts and practitioners who had been directly involved in the design and implementation of the two interventions implemented in Recife that we study in DESAFIO.
    - This included the inventor of the Condominial Sanitation system studied in WP2.2, who as Vice-Mayor of the city in the period 1993-1997 oversaw its introduction and implementation, and key people who participated in the process;
    - Most members of the team that participated in the implementation of the Integrated Sanitation system studied in WP3.2.
  - Representatives of local and national NGOs, workers unions, social movements, and other relevant actors;
  - Regional and national experts and practitioners.

- We took advantage of the Conference to launch our DESAFIO Working Papers series, which forms part of the WATERLAT-GOBACIT Working Papers Series.
    - We already published the first Working Paper with the proceedings of the Conference (in Portuguese).
- We will produced our first project book based on a revised version of the papers published in the proceedings and some invited papers. The book will be published as part of the WATERLAT-GOBACIT Book Series, with State University of Paraíba Press.
- We also produced a range of art designs for the Conference that have been useful for other activities (in Brazil). See Annex II.
- **International Course and Seminar**. We also decided to organize an International Course and Seminar in connection with our Second Project Meting that took place in Cali, Colombia, in August 2014. Taking advantage of the presence of colleagues from several countries, our local partner UNIVALLE proposed to organize an integrated course and seminar, which took place on 22-23 and 29 August 2014. Details of the activity, including copies of the presentations, can be accessed in the event's web page.
    - We engaged in the event members of our local Case Study Advisory Committee, who participated actively in the seminar.
    - We also engaged colleagues from the EU-funded project EJOLT, who participated throughout the Course and Seminar and gave presentations.
    - We will publish a detailed account of the event in a forthcoming issue of our Newsletter, and our Multi-media Gallery already contains images of the activities.
- **Second International Conference**, already reported above. The conference took place in Rio de Janeiro on 27-28 July 2015.
- **Self-funded post-project engagement and dissemination meetings**.
    - Seminar on Democratization of the politics of basic sanitation services through socio-technical innovations. Lessons to tackle the challenges, in Recife, Brazil, 19 August 2015. Co-organized with the WATERLAT-GOBACIT Network and local civil society organizations.
    - Seminar on Materializing the Right to Water and Basic Sanitation Services, Brasilia, Brazil, 9 September 2015. Co-organized with the WATERLAT-GOBACIT Network, federal institutions of the Brazilian government, the University of Brasilia, and other relevant organizations.
- **Special workshops dedicated to present DESAFIO's work and results at the WATERLAT-GOBACIT Research Network annual meetings**. We organized such workshops at
    - the V Annual Meeting held in Quito, Ecuador, on 15-17 October 2013,
    - the VI Annual Meeting held in Manizales, Colombia, on 27-31 October 2014, and in
    - the VII Annual Meeting held in Guadalajara, Mexico, on 20-23 October 2015, already after the end of the project.

Our long-term commitment

The Project Coordination, with the support of some partners and the WATERLAT-GOBACIT Network will keep the post-project activities of engagement and dissemination ongoing.

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3.2.3 Project management during the period

3.2.3.1. Work Package 8. Project Management

Objectives for WP8: Provision of overall management and coordination for the duration of the project, ensuring that the project goals are achieved and the project is run according to the time and budget proposed.

WP8 period: Month 1 to Month 30

There was one Deliverable expected for the reporting period:

D8.1 Academic, management and financial reports to EC

We achieved the Milestone for the reporting period:

MS19 Final Meeting: Month 30

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3.2.3.1. On the Deliverable D8.1

Setting the "Academic, management and financial reports to EC" was an error, as by definition these reports are not a deliverable, and form part of this Periodic Report and of the financial statements sent to the EC. We submitted a brief report as Deliverable D8.1 making reference to this fact and to cover the formality.

3.2.3.3. On the Milestone

MS19 Final Meeting

The Third and Final Project Meeting took place in Rio de Janeiro, Brazil, on 19-31 July 2015. Our partner UFRJ was in charge of the local organization, with support from the Project Co-ordinator. All project partners attended the meeting. Brief information and the Meeting's Agenda are available in the Third Project Meeting's web page. The Minutes of the meeting were duly submitted to the EC shortly after the meeting. In addition to the normal tasks, the meeting featured a visit to local communities in the Baixada Fluminense region of Rio de Janeiro, the site of our case study D2.3, which included a meeting with representatives of civil society organizations and community members. An account of the meeting and the visit will be included in the final issue of our quarterly Newsletter. Our photostream in the Multi-media Gallery will also feature details of the event. A short video of this visit is available in our YouTube channel.

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3.2.3.4. Consortium Management

Despite a number of problems reported in Periodic Report 1 and updated in the following section, the management of the consortium has been able to achieve the completion of most tasks according to plan and within schedule, as described in the previous pages. As also described earlier in the Section on WP7, the consortium has delivered additional products not originally envisaged in Annex I. Although this is a relatively small project, consortium management became a highly complex task owing to a number of factors such as a tight budget, and the fact that our partners were scattered across five countries in two continents. We had already anticipated most of the risks associated with our project in the original proposal under "Implementation", although we were only partially able to tackle them effectively and timely. Therefore, we consider that overall the management has been successful, with the provisos discussed in the following sections.

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3.2.3.5. Problems and Solutions

The task of consortium management faced from the start a number of challenges, which we discussed in detail in Periodic Report 1 and refer here again, where it is needed to update the information:

Contractual and Financial Matters

1) The process of contract negotiation with the EU was extremely slow, mainly because most of our partners in South America experienced problems to complete the legal and administrative requirements in time. This was mostly due to bureaucratic problems in each institution. Despite the fact that most of them had previous experience of participation in EU-funded projects, most also suffered from a lack of staff with experience in international contracts (probably because of staff rotation). Although we eventually solved the problem in Period 1, some of these issues reappeared in Reporting Period 2. However, eventually we managed to complete the final reports in time for the Reporting Period 2.

2) Another change that we report here is that partner UFRJ decided to pass unspent funds from their budget to UNEW. Given that partner UNEW had greatly underestimated the staff effort required to manage and coordinate the project, and that the Project Co-ordinator had to take over many tasks originally allocated to other partners, a transfer of budget was requested with the relevant amendment.

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Project Co-ordination

As reported in Periodic Report 1, the Project Co-ordination was subject to severe pressure during Reporting Period 1. The pressure did not disappear in Reporting Period 2, and rather increased significantly owing to a number of emerging issues.

1) As reported in Periodic Report 1, the Project Coordinator had to assume full responsibility for all Co-ordination tasks during the whole of the reporting period. The arrangements made at the Second Project Meeting to relieve some of the pressure on the Project Co-ordinator were not successful, and he continued to perform these roles virtually alone. In addition, as explained in previous sections he had to take over a number of tasks from other partners and the role of Project Administrator left vacant owing to Maternity Leave of the person in charge. After her return from Maternity Leave in early 2015, the Project Co-ordinator remained in charge of this task owing to strategic reasons, to avoid a repeat of the problems experienced in Reporting Period 1.

The Project Co-ordinator negotiated a further period of research leave with Newcastle University in order to be able to dedicate the time needed to perform his extended duties. The university kindly agreed to the request.

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Project Management Team and Latin American Co-ordination

Broadly, this section repeats what we reported in Periodic Report 1. Beyond the issues already discussed in other sections, there have been no new issues to report.

As explained below, the Project Management Team operated effectively taking into account that it only met face-to-face three times during the whole project, that several partners had no experience of working together before, and that there were important differences in terms of the disciplinary backgrounds and the diverse cultural identities of the teams. The fact that we were able to meet most of our targets despite some difficult circumstances is a good example of success.

This can be partly explained by the fact that the Project Co-ordinator has worked in close interaction with several partners before (UFMG, UFPE, UNR), and that he made a number of face-to-face visits, some several weeks long, to most other partners. He was only unable to visit partners CAGECE and UFRJ in this regard. These activities helped to spot potential problems and tackle them before they happen, find alternative solutions, and discuss strategies to complete the work up to the required quality. Still, it was not possible to avoid the delays in the submission of the case study reports, which caused delays in the final stage of the project, particularly in the work of WP5 and WP6. Also, some of the partners were unable to fulfil some of the roles originally envisaged for them in Annex I, and as explained before, the Project Co-ordinator stepped in to cover these gaps.

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3.2.3.6 Changes in the consortium

There have been no changes in the consortium in terms of institutional membership after the decisions taken during the Second Project Meeting, which we reported in Periodic Report 1.

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3.2.3.7. Project Meetings

We had a well-designed meeting's schedule, which can be consulted in our Meetings web page. We had a range of project meetings covering the activities of project coordination and management, research, and dissemination and engagement with wider publics. We divided these in Project Meetings and Engagement and Dissemination Meetings. We provided regular detailed information about our meetings in the pages of DESAFIO's Newsletter.

Project Meetings

DESAFIO's Team met three times during the project's life, in February 2013, August 2014, and July 2015 (see Face-to-Face Project Meetings). These were face-to-face plenary meetings with the participation of representatives from all the institutions that composed the Research Team to discuss the progress of our research and elaborate plans for the next stages. We invited to these meetings members of our Strategic Advisory Committee and of our Case Study Advisory Committees. These face-to-face meetings included a session of the Project Management Team, in charge of decisions about progress, problems and the management of the project work.

- Details of our three Face-to-Face Project Meetings:

    - The First Project Meeting took place in Recife, Brazil from 26th February to 1st March 2013. This meeting was hosted by our local partner at the Federal University of Pernambuco (UFPE). Visit the First Project Meeting's page.

    - The Second Project Meeting took place in Cali, Colombia from 25th to 28th August 2014. The meeting was hosted by our local partner in Colombia, the University of the Valley (Universidad del Valle – UNIVALLE). Visit the Second Project Meeting's page.

    - The Third Project Meeting took place in Rio de Janeiro, Brazil from 29 to 31 July 2015. This meeting was hosted by our local partner in Brazil, the Federal University of Rio de Janeiro (UFRJ). Visit the Third Project Meeting's page.

In between these three face-to-face meetings, we held regular, virtual, plenary meetings of the Research Team via internet, with similar objectives. Information about these plenary virtual meetings can be accessed in the meetings page.

In addition, the Project Coordination Unit maintained regular communication in person or via telephone, e-mail or internet. The Project Co-ordinator also held regular face-to-face and virtual meetings with members of the local Research and Project Management Teams from the consortium members in Argentina, Brazil, Colombia, and Portugal. These include pre-scheduled, face-to-face and virtual, individual meetings with each research team in charge of developing the project's ten Case Studies, to discuss progress and provide feedback. These meetings regularly included members of our Strategic Advisory Committee and of our Case Study Advisory Committees. Further details of these meetings is available if requested.

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3.2.3.8. Development of the Project website

We already reported the details of our website management in the section on WP7. We took our engagement and dissemination activities very seriously, and the Project's Website became a fundamental tool for these tasks.

It also became very important for our identity as a Research Team, mainly taking into account the facts that

- our partners were widely scattered across five countries and two continents
- we only met face-to-face as a team three times
- only a few of us actually participated in these face-to-face meetings, which means that most people in our consortium met only a few of their consortium colleagues during the project's life.

We have developed a powerful website, in the three languages of the project, and have a long-term commitment to keep it open, self-funded, to enhance our activities of engagement, dissemination, and impact generation in the mid and long-term

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3.2.3.9. Co-operation with other projects and programmes

From the start of the project, we carried out a number of activities in coordination with other projects and programmes. We reported these activities in the pages of our Newsletter.

A few examples:

- Our partners at UFPE provided advice to researchers from Programme Solidarité Eau, who carried out a study on the Condominial Sanitation system that is the subject of our case WP2.2. Some of them are also connected with the French-funded COQUEIRAL research project.
- We developed some joint activities with colleagues from several EU-funded projects, including ENGOV, EJOLT, ENTITLE.
- We have strong links with the Alliance for Water Justice, and some members of DESAFIO are also members of the Alliance.
- We have strong cooperation with a wide range of institutions and people in Africa, Asia, Europe and Latin America within the WATERLAT-GOBACIT Research Network.

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3.2.5 Statement on the Use of Resources

Table 1 presents the distribution of effort by Work Package and partner.

Table 1

	Total effort									
		P1	P2	P3	P4	P5	P6	P7	P8	
	Work Package	UNEW	UFMG	UFPE	UFRJ	CAGECE	UNR	UNIVALLE	IMAR	TOTAL
RTD	WP1	30.14	3.5	24.3	2.6	4.01	6.64	35.17	37.85	144.21
	WP2		6.2	1	42.8	0	0	0.36	1.25	51.61
	WP3		18	6	0	0	0	1.07	0.8	25.87
	WP4		14	0	0	38	17.36	0	2.9	72.26
	WP5		6	4	10.3	4	4	0.93	5.15	34.38
	WP6		3.3	4	8.5	3.99	4	0.66	0	24.45
OTH	WP7	2.64	3.5	18	37.5	7	16.35	4.61	2.5	92.1
MGT	WP8	8.69	6.5	3	8.1	3.61	3	0.61	1.5	35.01
Total		41.47	61	60.3	109.8	60.61	51.35	43.41	51.95	479.89
Budget PM		36	58	60	68	60	50	66	17	415
Difference		-5.47	-3	-0.3	-41.8	-0.61	-1.35	22.59	-34.95	-64.89

The reported distribution of effort presented in Table 1 requires an explanation: in the cases of partners UFRJ, UNIVALLE and IMAR, owing to internal accounting procedures the number of P/M has huge deviations from the original budget. We want to clarify though that these deviations are only nominal, and do not reflect an actual deviation from the budget, as explained later. In the case of the other partners, the deviations from the original allocation of P/M are minor and do not have implications for the budget.

The exception to the above concerns partners UFRJ and UNEW. 1) Although owing to their internal accounting procedures partner UFRJ has a very high figure for P/M, well above their original allocation, as shown later they actually had unspent funds. 2) In the case of partner UNEW, as explained before the original budget had underestimated the effort required for the Co-ordination and also for the Project Co-ordinator to take over a number of tasks from other partners. This is reflected in the difference of total PM spent against the original budget for this partner in Table 1.

As Table 2 shows, these deviations in the distribution of PM did not have an impact on the overall budget.

Table 2. Final cost statement

		BUDGET	ACTUAL COSTS (EUR)				
		100%	Period 1	Period 1 adj	Period 2	Total	Remaining Budget EUR
1	UNEW	60% o/h	75% Reimbursement				
	RTD	396,878.61	198,245.63		142,708.99	340954.62	55,923.99
	MGT	28,071.49	53,966.85		20,556.53	74523.38	- 46,451.89
	OTHER	12,116.80	29,570.55		10,340.83	39911.38	- 27,794.58
	TOTAL	**437,066.90**	**281,783.03**		**173,606.35**	455389.38	- 18,322.48
	Requested Contribution	337,847.25	232,221.62		137,929.10	370150.72	- **32,303.47**
2	UFMG	Actual o/h	75 % Reimbursement				
	RTD	233,237.22	76,506.56		87,125.97	163632.53	69,604.69
✓	MGT	11,860.93	5,251.52		6,037.15	11288.67	572.26
	OTHER	9,975.00	4,364.72		4,641.33	9006.05	968.95
	TOTAL	**255,073.15**	**86,122.80**		**97,804.45**	183927.25	71,145.90
	Requested Contribution	150,788.84	66,996.16		76,022.96	143019.12	**7,769.72**
3	UFPE	Actual o/h	75% Reimbursement				
	RTD	113,962.34	41,140.08		40,134.53	81274.61	32,687.73
✓	MGT	4,000.00	4,107.33		5,450.75	9558.08	- 5,558.08
	OTHER	11,600.00	25,022.98		13,706.42	38729.40	- 27,129.40
	TOTAL	**129,562.34**	**70,270.39**		**59,291.70**	129,562.09	0.25
	Requested Contribution	101,071.75	59,985.37		49,258.07	109,243.44	- **8,171.69**
4	UFRJ	60% o/h	75% Reimbursement				
	RTD	115,953.10	28,671.54		34,367.23	63038.77	52,914.33
✓	MGT	4,500.80	1,162.26		1,864.59	3026.85	1,473.95
	OTHER	15,000.00	11,580.82		24,591.30	36172.12	- 21,172.12
	TOTAL	**135,453.90**	**41,414.62**		**60,823.12**	102237.74	33,216.16
	Requested Contribution	106,464.43	34,246.74		52,231.31	86478.05	**19,986.38**
5	CAGECE	Actual o/h	50% Reimbursement				
	RTD	60,699.86	184,928.58		436,963.37	621891.95	- 561,192.09
✓	MGT	2,250.00	4,970.30		3,971.39	8941.69	- 6,691.69
	OTHER	3,000.00	14,331.11		24,076.44	38407.55	- 35,407.55
	TOTAL	**65,949.86**	**204,229.99**		**465,011.20**	669241.19	- 603,291.33
	Requested Contribution	35,599.93	17,612.45		17,987.49	35599.94	- **0.01**
6	UNR	Actual o/h	75% Reimbursement				
	RTD	85,617.14	39,015.70		27,372.13	66,387.83	19,229.31
✓	MGT	4,000.00	2,155.68		2,274.77	4,430.45	- 430.45
	OTHER	29,499.20	18,261.47		16,193.28	34,454.75	- 4,955.55
	TOTAL	**119,116.34**	**59,432.85**		**45,840.18**	105,273.03	13,843.31
	Requested Contribution	97,711.45	49,678.93		38,997.15	88,676.07	**9,035.38**
7	Univalle	Actual o/h	75% Reimbursement				
	RTD	105,175.20	61,488.53		43,537.14	105025.67	149.53
✓	MGT	4,000.00	1,360.00		2,640.00	4000.00	-
	OTHER	12,000.00	2,238.08		9,708.80	11946.88	53.12
	TOTAL	**121,175.20**	**65,086.61**		**55,885.94**	120972.55	202.65
	Requested Contribution	94,881.40	49,714.48		45,001.66	94716.13	**165.27**
8	IMAR	Actual o/h	75% Reimbursement				
	RTD	82,143.70	24,319.23	3,960.00	37,666.18	65945.41	16,198.29
✓	MGT	4,000.00			8,036.74	8036.74	- 4,036.74
	OTHER	10,000.00	63.39		14,463.39	14526.78	- 4,526.78
	TOTAL	**96,143.70**	**24,382.62**	**3,960.00**	**60,166.31**	88508.93	7,634.77
	Requested Contribution	75,607.77	18,302.81	2,970.00	50,749.77	72022.58	**3,585.19**
********** TOTAL **********							
	RTD	**1,193,667.17**	**654,315.85**	**3,960.00**	**849,875.54**	**1,508,151.39**	- **314,484.22**
	MGT	**62,683.22**	**72,973.94**		**50,831.92**	**123,805.86**	- **61,122.64**
	OTHER	**103,191.00**	**105,433.12**		**117,721.79**	**223,154.91**	- **119,963.91**
	TOTAL	**1,359,541.39**	**832,722.91**	**3,960.00**	**1,018,429.25**	**1,855,112.16**	- **495,570.77**
	Requested Contribution	**999,972.82**	**528,758.55**	**2,970.00**	**468,177.50**	**999,906.04**	**66.77**

3.3 Deliverables and milestones tables

Del. no.	Deliverable name	WP no.	Lead beneficiary	*Nature*	Dissemination level[4]	Delivery date from Annex I (proj. month)	Actual / Forecast delivery date Dd/mm/yyyy	Status No submitted/ Submitted	Comments
D1.1	Report: Governance, economic and social development and access to essential WSS	1	1	R	PU	6	12/05/2015	Submitted	Deviation explained in Periodic Report 1. See WP1.
D1.2	Final Report: DESAFIO's Theoretical and Methodological Framework	1	1	R	PU	24	09/11/2015	Submitted	See WP1
D2.1	A Political-institutional Assessment of SISAR: Final Report	2	2	R	PU	22	06/01/2015	Submitted	See WP2.1.
D2.2	An evaluation of participatory approaches to WSS in Zones of Special Social Interest: Final Report	2	3	R	PU	22	08/01/2015	Submitted	See WP2.2.
D2.3	A re-assessment of social WSS technologies in vulnerable communities in Rio de Janeiro: Final Report	2	4	R	PU	22	15/01/2015	Submitted	See WP2.3.

[4] **PU** = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).
Make sure that you are using the correct following label when your project has classified deliverables.
EU restricted = Classified with the mention of the classification level restricted "EU Restricted"
EU confidential = Classified with the mention of the classification level confidential " EU Confidential "
EU secret = Classified with the mention of the classification level secret "EU Secret "

D2.4	Empowerment, Resilience and Sustainability: integrated WSS in rural Colombia - Final Report	2	7	R	PU	22	07/02/2015	Submitted	See WP2.4.
D3.1	The SISAR model of community management of WSS: an ethnographic assessment: Final Report	3	2	R	PU	22	15/03/2015	Submitted	See WP3.1.
D3.2	The socio-technical dimensions of the 'integrated sanitation' system in Recife: Final Report	3	3	R	PU	22	23/02/2015	Submitted	See WP3.2.
D3.3	Community-based water associations in rural Colombia: Final Report	3	7	R	PU	22	08/02/2015	Submitted	See WP3.3.
D4.1	Final Report: Appropriate water technologies in an agrarian reform settlement in Minas Gerais	4	2	R	PU	24	23/02/2015	Submitted	See WP4.1.
D4.2	Final Report: A community oriented water and sanitation system in rural North East Brazil	4	5	R	PU	24	16/03/2015	Submitted	See WP4.2.
D4.3	Final Report: capacity building for monitoring water quality in vulnerable communities in Argentina	4	6	R	PU	24	24/02/2015	Submitted	See WP4.3.
D5.1	Cross comparative analysis of case studies	5	2	R	PU	25	18/09/2015	Submitted	See WP5.1.
D5.2	Cross comparative analysis of country practices within the Latin American context	5	2	R	PU	28	27/10/2015	Submitted	See WP5.2.
D6.1	Socio-technical solutions for the provision of safe WSS in vulnerable communities: a synthesis	6	1	R	PU	30	31/07/2015	Submitted	See WP6.
D6.2	National, regional and EU policy guidelines for the provision of innovative WSS	6	1	R	PU	30	31/07/2015	Submitted	See WP6.
D6.3	Recommendations for future research	6	1	R	PU	30	28/10/2015	Submitted	See WP6.3.
D7.1	Strategic	7	3	O	RE	1	1/3/2013	Submitted	See WP7.

	dissemination/communication plan								
D7.2	Website for internal and external communication	7	4	O	PU	2	31/3/2013	Submitted	See WP7.
D7.3	Project flyer	7	3	O	PU	4	31/5/2013	Submitted	See WP7.
D7.4	Electronic newsletter	7	3	O	PU	28	31/05/2013	Submitted	See WP7.
D7.5	Proceedings of International Conference	7	4	O	PU	30	31/07/2015	Submitted	See WP7.
D7.6	Dissemination Policy Briefs	7	6	R	PU	30	31/07/2015	Submitted	See WP7.
D8.1	Academic, management and financial reports to EC	8	1	R	CO	30	31/07/2015	Submitted	See WP8.

Milestones

TABLE 2. MILESTONES							
Milestone no.	Milestone name	Work package no	Lead beneficiary	Delivery date from Annex I dd/mm/yyyy	Achieved Yes/No	Actual / Forecast achievement date dd/mm/yyyy	Comments
MS1	Preliminary Report WP1.1	1	1	July 2013 - Month 6	Y	Several dates	We achieved this milestone with changes to the original plan (see explanation in Section 3.2.2.1. on WP1)
MS2	Preliminary Report WP2.1	2	2	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS3	Preliminary Report WP2.2	2	3	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS4	Preliminary Report WP2.3	2	4	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS5	Preliminary Report WP2.4	2	7	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS6	Preliminary Report WP3.1	3	2	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS7	Preliminary Report WP3.2	3	3	July 2014 - Month 18	Y	31/07/2014	Preliminary Report
MS8	Preliminary Report WP3.3	3	7	July 2014 - Month 18	Y	31/07/2014	Preliminary Report

MS9	**Preliminary Report WP4.1**	**4**	**2**	**July 2014 - Month 18**	**Y**	**31/07/2014**	**Preliminary Report**
MS10	**Preliminary Report WP4.2**	**4**	**5**	**July 2014 - Month 18**	**Y**	**31/07/2014**	**Preliminary Report**
MS11	**Preliminary Report WP4.3**	**4**	**6**	**July 2014 - Month 18**	**Y**	**31/07/2014**	**Preliminary Report**
MS12	**Electronic Conference Report**	**5**	**2**	**February 2015 - Month 25**	**Y**	**Several dates**	**See WP5**
MS13	**Stakeholder Meeting 1**	**7**	**3**	**February 2013 - Month 1**	**Y**	**Several dates**	**Several meetings**
MS14	**Stakeholder Meeting 2**	**7**	**7**	**July 2014 - Month 18**	**Y**	**Several dates**	**Several meetings**
MS15	**Stakeholder Meeting 3**	**7**	**4**	**July 2015 - Month 30**	**Y**	**Several dates**	**Several meetings**
MS16	**Inception/Kick Off**	**8**	**1**	**February 2013 - Month 1**	**Y**	**25/2 to 1/3/2013**	**Minutes**
MS17	**Advisory Board Operational**	**8**	**1**	**February 2013 - Month 1**	**Y**	**28/02/13**	**Creation of Strategic Advisory Committee and later also Local Advisory Committees for each case study**
MS18	**Mid-term Meeting**	**8**	**7**	**July 2014 - Month 18**	**Y**	**25-29/08/2014**	**Minutes**
MS19	**Final meeting**	**8**	**4**	**July 2015 - Month 30**	**Y**	**July 2015 Month 30**	**27-31/7/2015**

Annex I – DESAFIO logo and arts

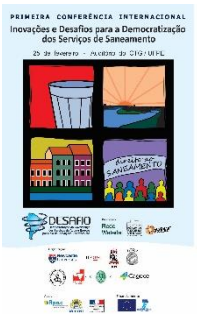
DESAFIO's logo in the three languages of the project:

DESAFIO
Democratização da Governança dos Serviços de Água e Esgotos por Meio de Inovações Sociotécnicas

DESAFIO
Democratisation of Water and Sanitation Governance by Means of Socio-Technical Innovation

DESAFIO
Democratización de la Gobernabilidad de los Servicios de Agua y Saneamiento Mediante Innovaciones Socio-técnicas

Art for the First International Conference:



Advert 1

Advert 2

T-shirt

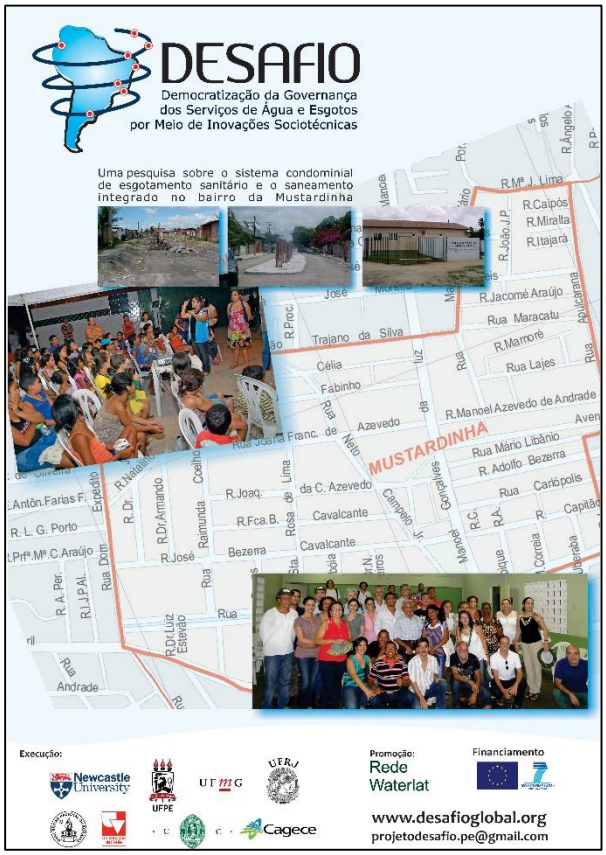
Banner 1

Certificate

Banner 2

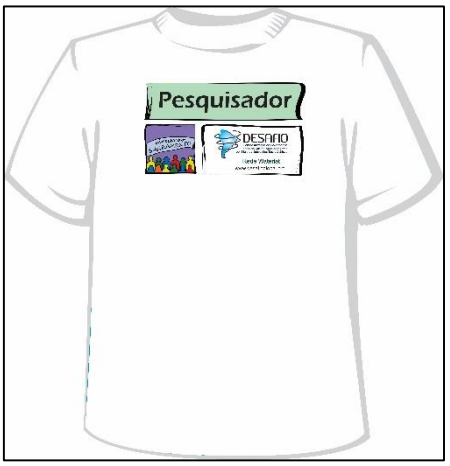
All designs by Alexandre Ramos, from the Federal University of Pernambuco (UFPE) team.

Designs and art used to advertise local seminars, workshops, and other fieldwork activities related to case studies WP2.2 and WP3.2, Recife, Brazil.



Banner

Invitation



Shirt for the research team in charge of applying a questionnaire in Mustardinha community (identification of researchers as a security measure)

Designs by Alexandre Ramos, from the Federal University of Pernambuco (UFPE) team.

Second International Conference logo. Produced by the UFRJ team