

**SEARCHING FOR SUCCESS IN
COMMUNITY MANAGEMENT
FOR RURAL WATER SUPPLIES
OVER 30 YEARS**

Cranfield
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Acronyms

ADB	Asian Development Bank
AfDB	African Development Bank
CBM	Community-based management
CBO	Community-based organisation
EEVERT	Effective, Equitable, Viable, Efficient, Replicable and Transparent
GDP	Gross Domestic Product
HDI	Human Development Index
IRC	IRC
M&E	Monitoring and evaluation
NGO	Non-governmental organistaion
O&M	Operation and maintenance
PPP	Purchasing Power Parity
RWS	Rural Water Supply
WEDC	Water, Engineering and Development Centre
WHO	World Health Organisation
WSP	Water and Saniation Programme of World Bank

EXECUTIVE SUMMARY

Background

Community management of rural water supplies is an approach that gives control of the water systems to the communities. Over the past three decades, it has become common for rural communities to adopt this approach to manage their water systems. Past experiences have shown that community water supply needs some add-ons or “Plus factors” to ensure sustainability and scalability. The present study contributes to the Community Water Plus project funded by Australian Aid, which aims at determining the extent of “Plus factors” required for success.

Aim and research questions

The aim of this study is to critically review and analyse the development pattern of successful community-managed rural water supplies over the past three decades. Two research questions were addressed:

- What Plus Factors are associated with successful community managed rural water supplies?
- Is the socio-economic setting indicative of the likely success of a community managed rural water supply?

Methodology

The research method consisted of a systematic review of the case studies using a “Success Framework” followed by in-depth evaluation of the case studies and the socio-economic setting.

Key Findings & Conclusion

The study has showed that for community management to be successful, a certain level of socio-economic wealth is necessary, but not sufficient. A combination of different Plus factors, both internal and external, is also needed to make the community management approach sustainable and successful.



CHAPTER 1

INTRODUCTION

1.1. BACKGROUND

Over the past three decades, community management has become a common model for rural water supply (RWS) (Schouten and Moriarty, 2003). This approach first started with community involvement in the construction stage only, then progressed into community participation through all stages and finally resulted in community management. In the process, the responsibility for providing water services gradually shifted from the government to the communities themselves.

In the past decades, adaptation of the community management model had improved rural water supplies significantly and, presently, it has become the guiding principle for most rural water supply projects. However, success stories of community management remained isolated pockets of achievement (Schouten, 2006). Community management has failed to reach its full potential on two main counts (Bolt et al., 2006): lack of long-term sustainability, and lack of larger scale projects.

From the past successes and failures, it was found that these sustainability and scalability could only be achieved if communities received appropriate levels of support, a “Plus” to sustain community water supply (Schouten and Moriarty, 2003). The extent of this Plus required varies from community to community. It includes not only providing resources in the shorter term, but also creating an enabling environment in the longer term.

One of the projects which aims at determining the extent of support required is the Community Water Plus project. Funded by the Australian Aid, led by a consortium of organisations (IRC, Administrative Staff College of India, the Centre of Excellence for Change in Chennai and Malawaya National Institute of Technology) and coordinated by Cranfield University, this project investigates successful community-managed rural water supply programmes across India (http://www.waterservicesthatlast.org/countries/india_community_water_plus_project/community_water_plus).

The present study contributes to this research project by looking at historic successful case studies in developing countries worldwide, except for India. Through the investigation of the practices of community-managed rural water supplies in different countries, this study will help develop the understanding required to support sustainable services.

1.2. AIM AND RESEARCH QUESTIONS

The aim of this study is to review the history and critically analyse the pattern of development of ‘successful’ community management of rural water supplies over the past three decades in developing countries outside of India.

The two main research questions are:

1) What Plus Factors are associated with successful community managed rural water supplies?

2) Is the socio-economic setting indicative of the likely success of a community managed rural water supply?

1.3. OUTPUTS

The main outputs of this study are:

- The present *report*, highlighting the findings of the research and its implications
- A *detailed annotated bibliography* of the analysed case studies stored on **Mendeley**, which could serve as a future resource to the water sector
- A framework to analyse the success of community-managed water supplies, called '*Success framework*', which could serve as a future tool to the water sector
- A spreadsheet to analyse the socio-economic setting of community-managed water supplies, called '*Socio-economic spreadsheet*', which could serve as a future tool to the water sector

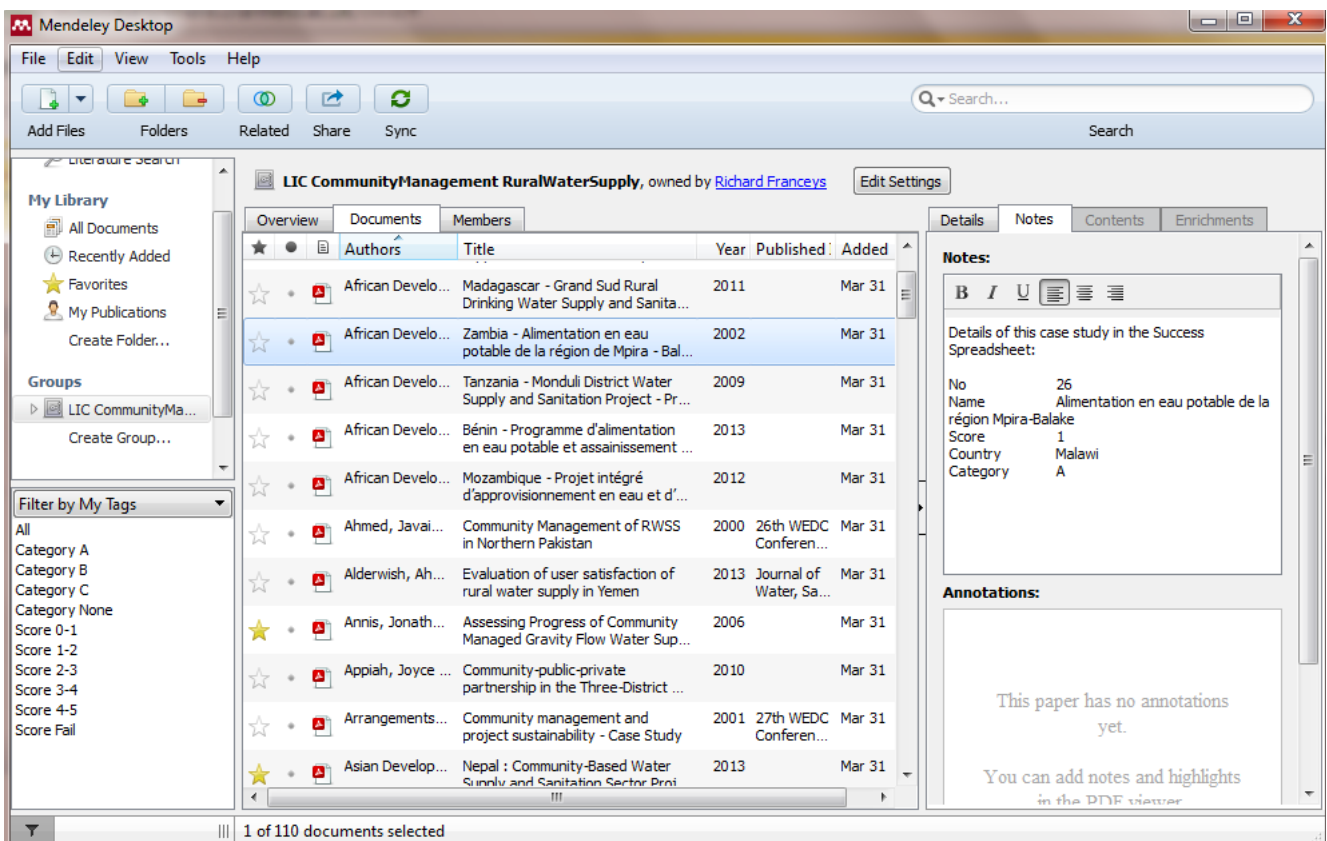


Figure 1. Mendeley database with the case studies

Box 1. Nepal, characteristics of successful case study [Case 32]

As part of its 10th National Development Plan, one of the focuses of the Government of Nepal was decentralisation programmes and poverty reduction through the provision of rural water supply and sanitation (RWSS). The \$36.9 million, ADB funded through loan RWSS project (ADB, 2013) was designed with two components in mind. The RWSS component aimed to provide improved water and sanitation services through community based approach and capacity building for sustainability. The second component sought to strengthen the institutional capacity of local authority institutions, the district development committees (DDCs) and village development committees (VDC). 4,552 kilometers of pipeline were laid and 1,390 water storage reservoirs were constructed, with water distribution through 100% private household connections.

Institutional Dynamics

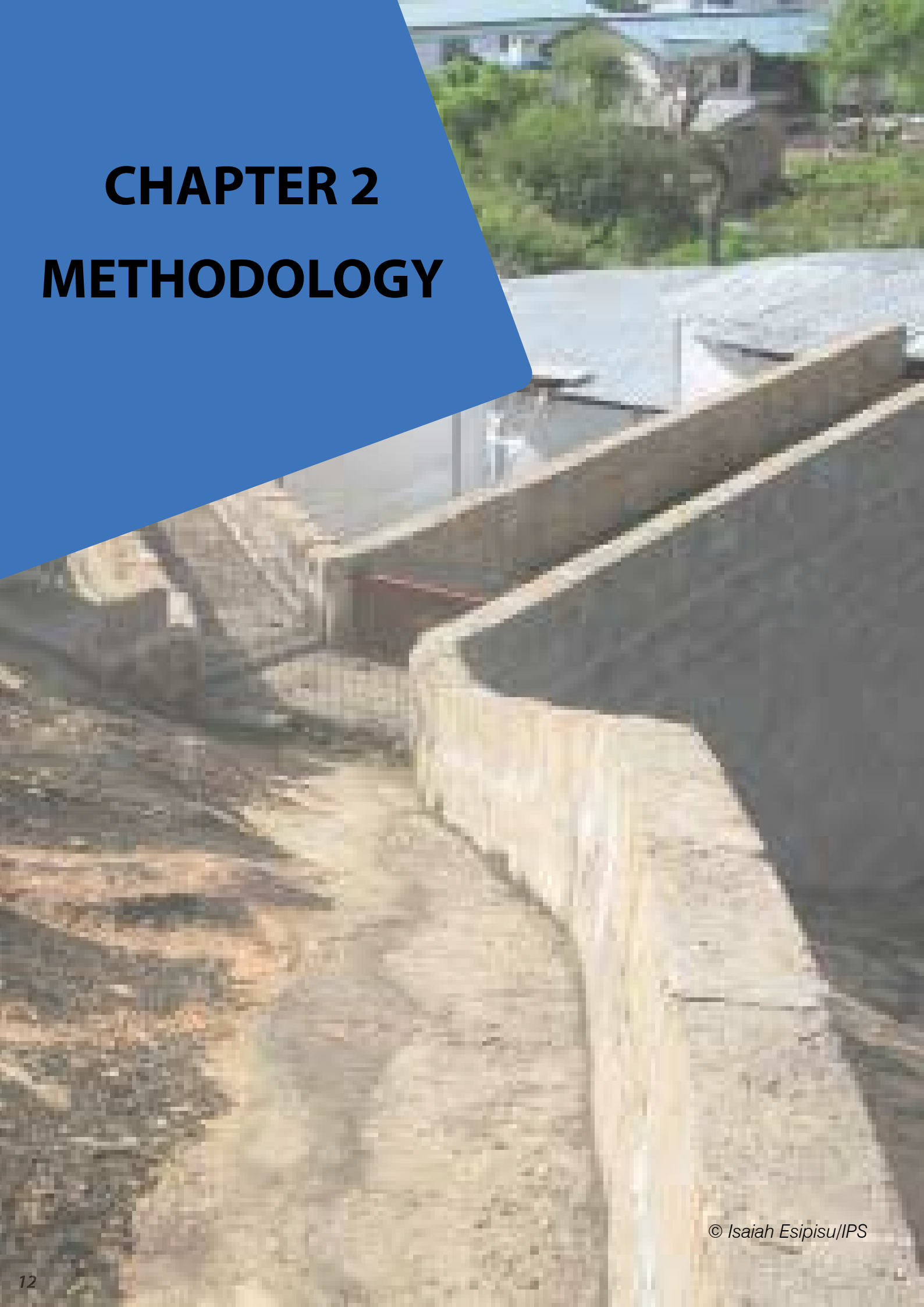
As part of the decentralisation policy of the government, the Ministry of Physical Planning and Works (MPPW) was the executing agency but delegated its authority to the Department of Water Supply and Sewerage (DWSS) for the execution of the project. At a local level, the DDCs of participating districts were the implementing agencies and the institutional strengthening component focused primarily on capacity building in areas such as finance, community organisation, greater involvement of the private sector (including NGOs) and creation of new units or departments to reach out and support community action. A project management unit (PMU) was established under the DWSS at the central level. Each DDC entered into a project agreement with the MPPW where a Water and Sanitation Support Unit Office (WSSUO) was formed. A core team of DDC staff was hired for each WSSUO under contract with the DDC and in consultation with the PMU. At a community level, each DDC formed water user sanitation and communities (WUSC). By building the capacity of the local district government instead of bringing an outside organisation to fulfill short-term goals, the project increased its likelihood of achieving long term sustainability.

Community Participation

Communities contributed to the planning, construction and implementation phase. User's contribution was in the form of labour or cash contributions. Poor communities in remote and inaccessible areas minimum contribution was reduced from 20% to 10%. The WUSC took over the operation and maintenance (O&M) with the support of trained village maintenance worker. Most WUSCs were collecting monthly cash tariffs for paying village maintenance workers. The monthly water tariffs were set at low rates and were affordable to all households, including the poor. Although the WUSCs had cash balances in their O&M accounts, communities would need some sort of support for major O&M from the government beyond their means.

At project completion, 568,177 people were reported to have access to drinking water and sanitation facilities, and the time spent collecting drinking water was reduced by around 50%. Sanitation awareness had grown significantly after the project and as a result 69 subproject areas (10% of the total) were declared open defecation-free. Since project completion, the DWSS had provided continuous support to WUSCs willing to improve their sanitation situations.





CHAPTER 2

METHODOLOGY

This chapter discusses the methodology used to answer the two research questions of this project. A **systematic review** of the case studies was selected as the core methodology, as it facilitated the presentation of features and complexities of community management.

The methodology was divided into two main stages:

- 1) **Case study evaluation**; to provide understanding of the specific characteristics of successful community managed rural water supply systems and a basis for the identification of Plus factors.
- 2) **Socio-economic evaluation**; to provide an insight into the potential relationships between successful cases and socio-economic settings.

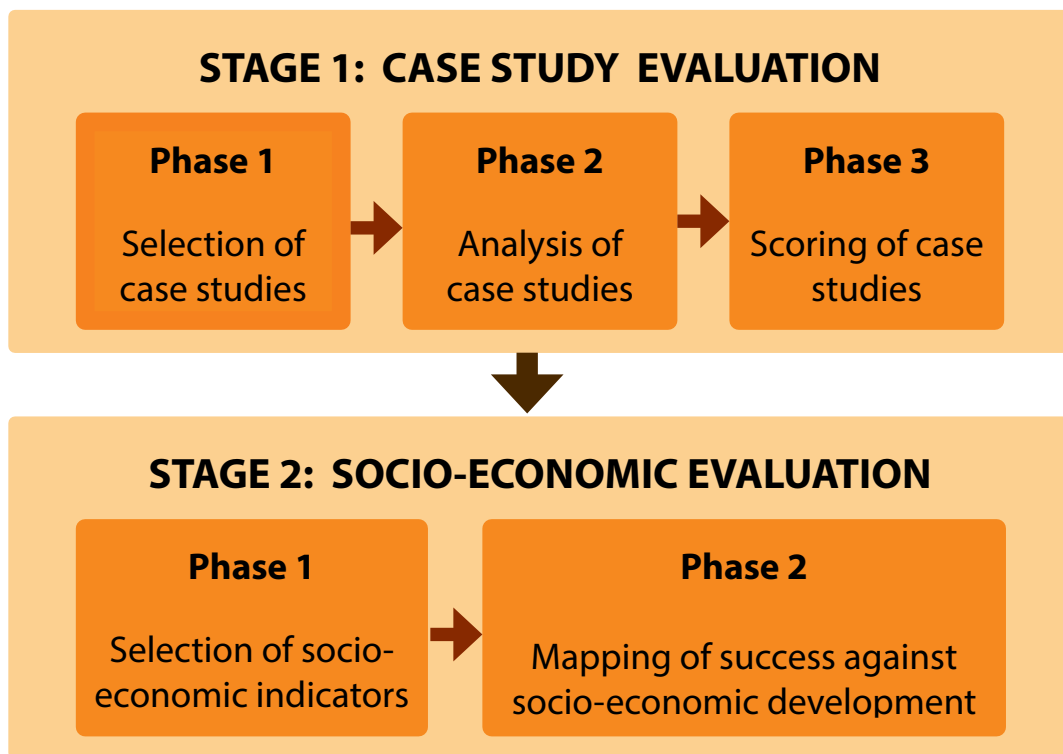


Figure 2. Methodology of the study

2.1. CASE STUDY EVALUATION

The first stage of the method was to examine successful case studies of rural water supplies managed by the communities themselves. The purpose of the case study evaluation was to determine the characteristics of success and identify the Plus factors associated with it.

Success was broadly defined in this study in terms of supply of water: if the system was still delivering water to the people, the case study was considered as successful. The level of this success was then determined according to different elements (e.g. quality of management, service level).

The case study evaluation consisted in three phases (**Figure 3**): first the cases studies were selected, then analysed in order to evaluate their success and identify the Plus, and finally scored to determine their level of success.

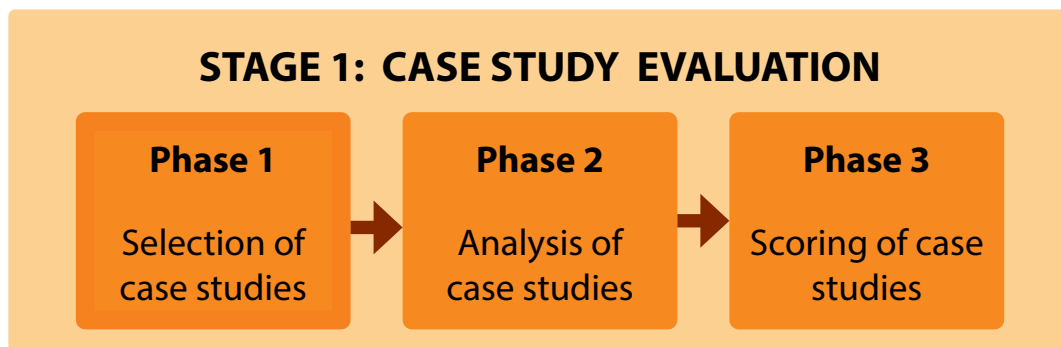


Figure 3. Phases of the case study evaluation

2.1.1. PHASE 1 - SELECTION OF CASE STUDIES

The selection of the case studies was kept broad in order to capture as many community-managed systems as possible. This selection started with a quick scan of case studies, to determine whether they met four basic criteria:

- Systems located in developing countries (outside India)
- Systems providing water to rural areas
- Systems managed partially or entirely by the community
- Systems functioning and delivering water to the community

This first scan was undertaken with an extensive and detailed review of all documentation associated with rural water sector. Both academic journal papers and grey literature were reviewed. Sources included: IRC; Water, Engineering and Development Centre (WEDC) online and on campus library; World Bank Water and Sanitation Programme (WSP); WaterAid; African Development Bank (AfDB); Asian Development Bank (ADB); Scopus (search engine for academic papers and MSc Thesis from various universities). All documentation reviewed was stored in a virtual storage system called Mendeley (**Figure 1**) to be used as a future database for the rural water supply sector.

The quantity of case studies found in each source and their quality varied. Some sources provided numerous and complete case studies (i.e. IRC, WEDC and World Bank), while others focused more on rural community management as a model and did not propose case studies (i.e. academic papers found in Scopus). **Figure 4** includes the proportion of case studies found in each source reviewed.

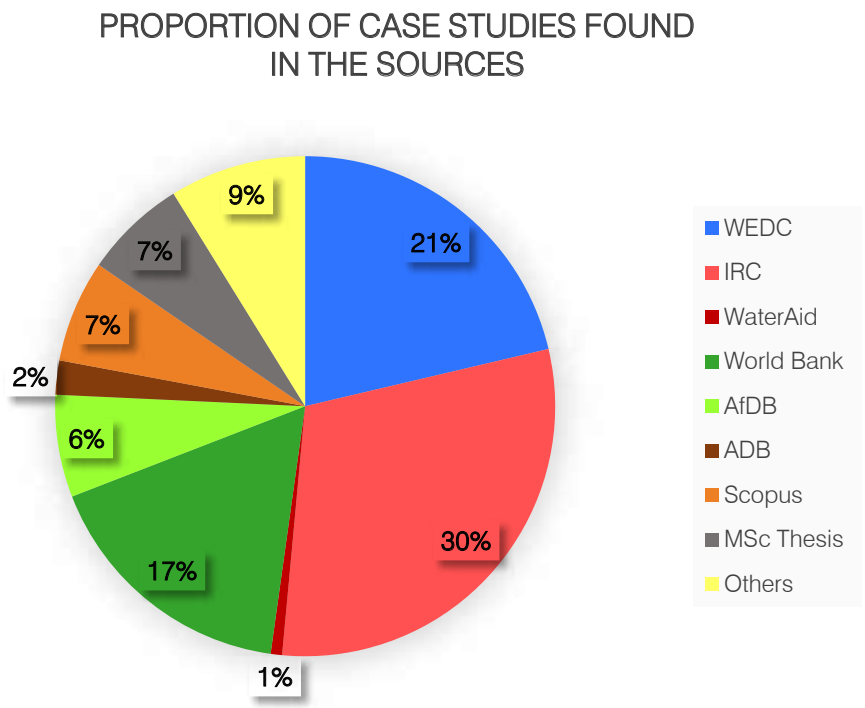


Figure 4. Proportion of case studies found in the sources reviewed

A total of 200 case studies were scanned and found in the different sources reviewed, but only 130 were defined as successful and selected for evaluation. Although not exhaustive, this number of case studies was sufficient for the analysis of Plus factors. In addition, the selected case studies were located in different regions of the developing world, as shown in **Figure 5**.

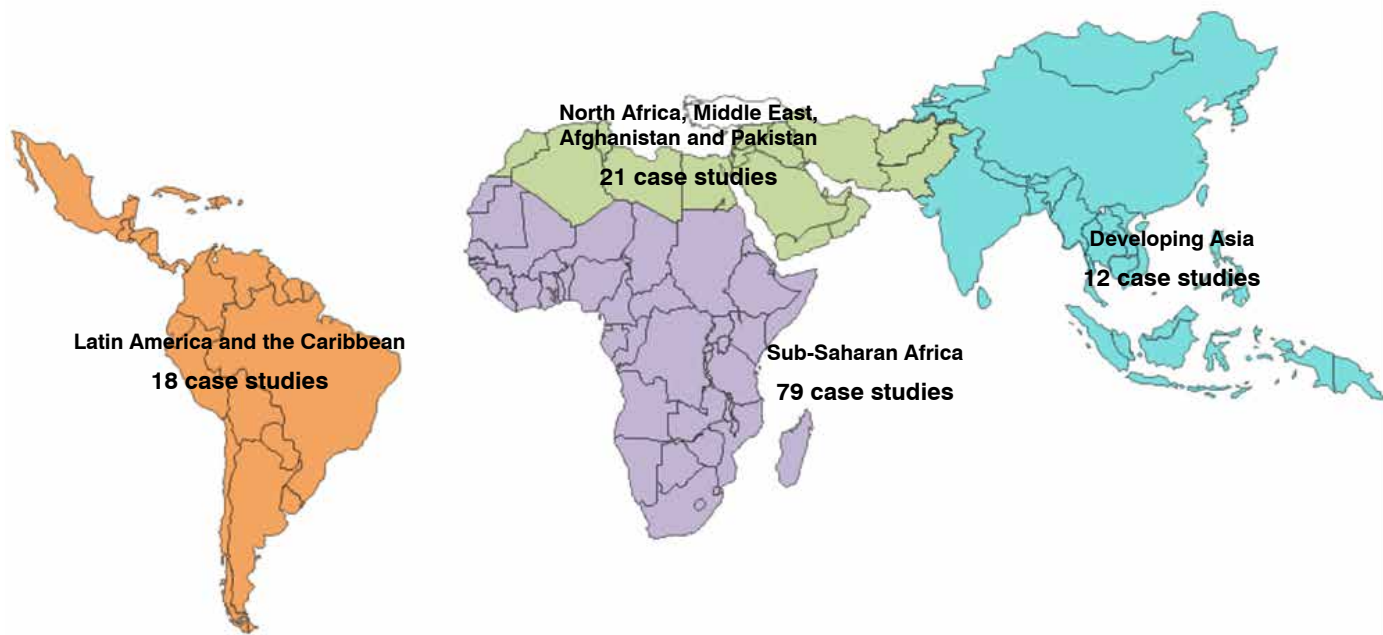


Figure 5. Location of the case studies selected

2.1.2. PHASE 2 - ANALYSIS OF CASE STUDIES

The case studies identified as successful in the first phase were then analysed using the “**Success Framework**”, a qualitative tool created for this study which aimed at extracting information from the successful case studies according to a set of criteria.

This framework (explained in **Appendix A**) provided a systematic manner to develop the analysis of the case studies, and also a basis for the next scoring phase. The framework included information about different aspects of the water system, from technology to sustainability and community’s role (**Figure 6**).

GENERAL INFORMATION							SUSTAINABILITY				
No	Name	Score	Year			Country	Category (A/B/C)	Technical	Financial	Institutional	Scalability
			Completion	Analysis	Years from completion						
WATER SYSTEM											
Technology			Service level					Service efficiency	Service provider		
Infrastructure	Complexity	Quantity	Quality	Coverage	Reliability	Accessibility					
COMMUNITY PROFILE											
Demographic profile		Economic profile		Capacity		Access		Additional socio-economic factors			
Population	Structure	Average household income	Main source of income	Education al level	Technical skills	To technology	To financial resources				
COMMUNITY ROLE						EXTERNAL 'PLUS'					
Involvement			Contribution		Transparency	Support			Enabling environment		
Level	Mode	Responsibilities	Type	Level		Type	Entities involved	Function	Institutional mechanisms	Existing policies	

Figure 6. Information included in the success framework

When analysing the case studies with this framework, not all of them provided enough information to complete all sections. Nevertheless, the framework offered a systematic approach for analysis.

Figure 7 provides an overview of the results of this systematic analysis of case studies (for the analysis of all 130 case studies, please see **Appendix A**).

		COMMUNITY ROLE							
No	Name	Involvement			Contribution		Transparency	Type	Entities involved
		Level	Mode	Responsibilities	Type	Level			
28	Kakra Village Case Study	High (the village played a major role in the identification of the water scheme and in collecting the contribution toward the capital cost)	Water Supply Committee (WSC)	Responsible for: ·O&M of the water scheme ·Collection of the monthly water tariff ·Maintenance of the accounts	Cost contribution	40% of the initial capital costs were provided by the village. Maintenance and other operational costs are borne by the village community, via monthly water tariffs	High. Most decision are taken by arriving at consensus within the committee, and bigger issues are discussed with the whole community	Funding	UNICEF/AJK Government
29	Khaliqadab Village Case Study	Low (they were not involved in the implementation of the system, nor in its management for the first four years)	Two Water Supply Committees, one representing the locals and the second representing the refugees	Both WSCs are responsible for: ·O&M of the water scheme ·Collection of the monthly water tariff ·Maintenance of the accounts (joint account shared by both WSCs)	Non	Village contributed 0% of the costs of the project	NA	Funding and initial management of the system	1) UNICEF/AJK Government 2) LG&RDD (Local Government and Rural Development)
30	Dhoke Daurah Village Case Study	High (the community has been very actively involved in the planning/implementation/design of the water scheme)	12 sub-committees representing 12 mohras	·Procurement ·Pipe laying and jointing ·Building tanks ·Collecting monthly water tariff ·O&M of water system	Cost contribution	6% of the initial capital costs were provided by the village	High. All decisions within the WSC are taken through a majority vote (and problems are resolved in a democratic way)	Funding and design	1) Government of AJK 2) IDA (International Development Association)
31	Ambryala Village Case Study	High (the community has been very actively involved in the planning/implementation/design of the water scheme)	1 central community and 15 sub-committees	·Overseeing pipe laying and jointing ·Building tanks ·Collecting monthly water tariff ·O&M of water system"	Cost contribution	12% of the initial capital costs were provided by the village	Decisions are taken by majority vote	Funding and design	1) IDA (International Development Association) 2) LG&RDD
32	Nepal Community Based Water Supply and Sanitation Sector Project	High, communities contribute to the planning, developing, construction, and operation and maintenance (O&M)	All water user and sanitation committees (WUSCs)	Operates the water supply systems, undertaking maintenance and occasional repairs with the support of trained village maintenance workers, and raising the monthly tariff to undertake these tasks.	Cost contribution	poor communities in remote and inaccessible areas, the minimum contribution was reduced from 20% to 10%	High (the CBO takes accountability of its activities)	Funding and execution, support and monitoring	1) Dept of water Supply & Sewerage (DWSS) 2) Water and Sanitation Support Unit Office (WSSUO) 3) District development committees (DDCs) 4) ADB 5) NGOs 6) The Ministry of Physical Planning and Works (MPWA)
33	Peddie Rural Villages Case Study	Only responsible for monitoring, not providing the service	Local water service provider (consisting of 2 representatives from each of the 4 villages)	·Responsible for monitoring the system ·Responsible for customer relations and communication with the community ·Accountable to the community	NA	NA	High (the CBO takes accountability of its activities)	Funding and implementation	1) Amanz'abantu Services Ltd 2) Mwila Trust 3) Amatola Water
34	The Aguacatán Case Study	High (the community came up with the idea to construct the water system, and raised the funds to have institutional support)	Seven water committees (from each village) that elected the Central Board for the multi-village Water Projects Association of Aguacatán (APAGUA)	·Manage the water system on a daily basis (O&M, financial management, repairs) ·Make sure that other institutions are following their responsibilities	NA	NA	NA	Capacity building	SER (Servicios para el desarrollo)
35	El Ingenio Water System	High (the community came up with the idea to develop the water system, and is the sole responsible for the management of the system)	Users Committee	·Implementation of the service (with labour and cost contribution) ·Operation and management of the system	Cost contribution and labour	40% of the implementation costs, and 100% of the O&M costs	A reglament was agreed by the users committee, that defined clearly the plans and budget of the scheme	Funding and support	1) SUM Canadá 2) FONCODES 3) Local government

Figure 7. Success framework overview

2.1.3. PHASE 3 - SCORING OF CASE STUDIES

Once all case studies were analysed through the Success Framework, they were scored to determine the level of success of the water system. A score between 0 and 5 was allocated, with 0 representing a *marginal success* (e.g. a water supply that delivers water to the community, but is not well managed nor provides good service levels) and 5 representing a *full success* (e.g. continuous delivery of water and well managed system).

The scoring of the case studies was undertaken using a “Scoring Sheet” (example given in *page 19*), and it was based on different aspects of the water service delivery, known as “EEVERT” (Effectiveness, Equitability, Viability, Efficiency, Replicability and Transparency). These aspects of success except for transparency were in line with what was used in the Community Management Plus Project in India.

The success aspects were individually scored according to the following criteria (**Table 1**):

- *Effectiveness*: quantity and quality of the service, reliability of system
- *Equitability*: coverage and accessibility of the system
- *Viability*: sustainability, mostly technical and financial, of the system
- *Efficiency*: management of the supply in accordance with the resources available
- *Replicability*: possibility to scale up the system
- *Transparency*: communication between the service provider and the community

	SATISFACTORY 0 ≤ Score ≤ 1	GOOD 1 < Score < 3	VERY GOOD 3 ≤ Score ≤ 4	EXCELLENT 4 < Score ≤ 5
Effective (is the system delivering water?)				
Equitable (can the system be accessed by all the community?)				
Viable (is the system sustainable?)				
Efficient (is the system well managed?)				
Replicable (can the system be implemented in other areas?)				
Transparent (is there clear accountability in the management?)				

Table 1. EEVERT indicators for scoring process

After scoring each aspect individually, an average of all was taken as the final score for the case study. When it was not possible to score a specific “EEVERT” aspect due to lack of information, it was left unscored and not considered in the calculation of the overall score.

However, since the scoring method was subject to a significant amount of personal judgement (e.g. while allocating scores to each aspect), it was important to have a mechanism of validation in place. This would help ensure the consistency of the scoring process amongst different reviewers. The “**Peer Review system**” was established with this aim, and consisted of reviewing and scoring one case study from another reviewer on a weekly basis, in order to compare and discuss the scores. The Peer Review system provided a difference between scores of no more than 0.5, which indicated that the scoring process was homogenous and consistent.

The outcome of this scoring phase had resulted in the allocation of scores for all the 130 analysed case studies, which would be used for further analysis in relation to the Plus Factors and Socio-economic setting (see Chapter 3).

EXAMPLE OF SCORING SHEET

No of case study	57
Name of case study	Piped water in Hasal, Chakwal
Year of completion of the project	1988
Year of analysis of the case study	1994
Years from completion	6
Location	Pakistan

SUMMARY OF THE CASE STUDY:

This case study illustrates how the management of a village water supply was transferred from an entity to other, and the problems raised in each case. The history of the management was:

- First 4 years under the national government entity (PHED), and the community was happy with the management
- Next 3 years under the local government entity (Union Council) and the community was not happy with the management due to lack of transparency, resulting in the closing of the scheme
- Since 1988, under the village itself (Hasal Welfare Committee), thanks to the rehabilitation

Good points:

- The scheme was developed to fulfil the needs of the community
- The village took the responsibility to manage the system in the end, and it has been running since 1988 under their responsibility

Bad points:

- Villagers were not consulted in the design and planning of the scheme
- Only 250 of the 1400 households were able to afford the connections
- The scheme was not equitable (houses in the higher levels couldn't meet their daily minimum requirements)
- The scheme could not meet the increased demand for water

SCORING OF THE CASE STUDY: 2/5

	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT
Effective		2		
Equitable	0			
Viable			3	
Efficient			3	
Replicable				
Transparent		2		

Effectiveness is given a 2 because the system has been running for the last 6 years and household connections are functioning.

Equitability is given only a 0 because only 15% of the households can be connected to the network, and because the scheme excludes those located in higher levels.

Viability is given a 3 because the system has been able to work satisfactorily for more than 5 years.

Efficiency is given a 3 because the community improved the management of the scheme after rehabilitation.

Transparency is given a 2 because the welfare committee is trying to take into account the community's needs in its decisions.

2.2. SOCIO-ECONOMIC EVALUATION

The second stage of the methodology was to map successful community managed projects against socio-economic information, with the purpose of:

- Determining whether the socio-economic setting is indicative of the likely success of the community managed rural water supplies
- Developing better understanding of the success of community management in delivering water to rural areas ahead of the socio-economic development trend line

The socio-economic evaluation stage consisted in two phases: first the selection on the types of socio-economic indicators for evaluation, and then the mapping of success against the evolution of these indicators with time.

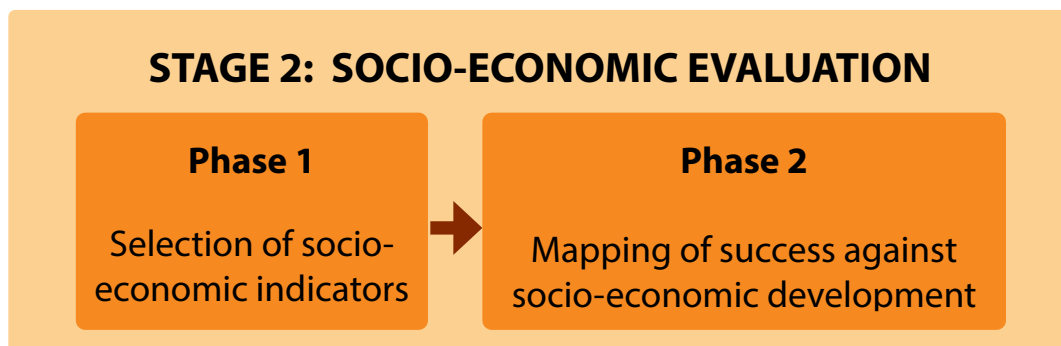


Figure 8. Phases of the socio-economic evaluation

2.2.1. PHASE 1 - SELECTION OF SOCIO-ECONOMIC INDICATORS

The first step of the socio-economic evaluation was to review and select socio-economic indicators. These indicators would provide a mean for the evaluation of the community management success.

Five different indicators, reflecting wealth and development of countries and their populations, were reviewed and analysed:

- **Gross Domestic Product (GDP):** is the market value of all final goods and services produced within a country in a given period of time
- **Gross Domestic Product per person (GDP per person):** is the GDP divided by the resident population
- **Human Development Index (HDI):** is the normalized measure of development by combining indicators of life expectancy, education, standard of living and income.
- **Revenues from water related taxes:** corresponds to the taxes deemed to be of particular water relevance
- **Food prices:** is a measure of the international prices of a basket of food commodities

To select the appropriate indicator for the socio-economic evaluation, two basic criteria were taken into account: data availability (data obtainable in all years and countries of the case studies) and ability to provide information about the progress in the rural water supply sector.

Both revenues from water related taxes and food prices were not selected because they were not available in all countries of the case studies.

The HDI was found to be a powerful indicator to reflect the human condition in a more appropriate way than GDP, which only focused on the value added of production and did not consider social and environmental issues. However, as the correlation between GDP per person and HDI was high (Gapminder, 2011), evaluating the case studies based on HDI would have given a similar picture that doing it based on GDP. Therefore, **GDP per person was selected** as the indicator for the socio-economic evaluation.

2.2.2. PHASE 2 - MAPPING OF SUCCESS AGAINST SOCIO-ECONOMIC DEVELOPMENT

The final phase of the socio-economic evaluation was to map the success of the case studies against the socio-economic indicator selected. This provided an insight into whether the socio-economic setting is indicative of success.

Phase 2 started with the gathering of GDP data, which was collected from the World Economic Outlook database (October 2013). Two sets of data were gathered to capture the wealth of the regions and give an idea of their people's financial resource: GDP values and GDP per person based on Purchasing Power Parity (PPP). Since GDP values were expressed in US dollar and in nominal values, they were translated to real values (US dollar) before being plotted, to remove the effects of inflation. This translation consisted in multiplying the nominal values by a GDP deflator (as shown in the **Socio-Economic Spreadsheet**, included in **Appendix B**). GDP per person based on PPP was used as it was given in the database, without further transformation.

The image shows a screenshot of a spreadsheet with a blue header row labeled '1 - GDP data'. The spreadsheet contains data for various regions and metrics over time. The columns represent years from 1980 to 2013. The rows include:

- Developing Asia
- Latin America and the Caribbean
- Middle East, North Africa, Afghanistan and Pakistan
- Sub-Saharan Africa
- Developing Asia
- Latin America and the Caribbean
- Middle East, North Africa, Afghanistan and Pakistan
- Sub-Saharan Africa
- GDP index
- GDP index = 100

 The data cells contain numerical values representing GDP and GDP per person for each region and year.

Figure 9. Overview of the Socio-Economic spreadsheet

The next step was to plot the evolution over time of GDP and GDP per person alongside the success level of the case studies analysed. For this, the case studies were grouped in four regions, defined by the International Monetary Fund:

- Sub-Saharan Africa
- Latin America and the Caribbean
- Middle East, North Africa, Afghanistan and Pakistan
- Developing Asia

For each region, the socio-economic plot included a double vertical axis, so that both GDP and success score could be mapped simultaneously over time. In each plot, the case studies were represented according to the number of years from completion. This allowed us to have a better understanding of the evolution of the success level of the case studies over the last thirty years. In the end, several graphs were constructed, and showed the progress of the successful community managed water supplies alongside the economic growth.

CHAPTER 3

RESULTS AND DISCUSSION



3.1. KEY ISSUES OBSERVED

Through the examination of 130 successful rural water supply projects in 39 developing countries around the world (excluding India), it was observed that even the most successful community management system could still be plagued with issues. There were several **key issues** which appeared continuously across most of the case studies (**Table 2**).

Key issue	Description
Technology and size of water system	- Difficult access to spare parts for repairs - Difficult maintenance in large water systems
Financial efficiency of the service delivery	- Challenges in tariff setting to cover O&M - Challenges in bill collection
Sustainability of the service	- Lack of long-term financial and institutional support
Community involvement	- Planning, desing and implementation without involving the community
External support	- Lack of planning of the supporting organisations

Table 2. Key issues observed in the case studies

Technology and size of water system

The major type of water system was standpost with gravity piped scheme (approximately 60% of all cases), followed by handpump (approximately 30%). There were also cases of individual household connection with gravity piped scheme (approximately 10%). The complexity of the systems ranged from low to medium in most of the cases. Whilst the technology of water system was kept simple, most of the communities were not able to gain access to spare parts for repairs. In some cases, villagers relied on local knowledge for simple repairs (Annis, 2006).

On the other hand, the size of the scheme was as important as the technology, in terms of sustainability. The Malawi rural piped scheme programme had been regarded as the cornerstone of participatory approach to rural drinking water supply, as shown in numerous case studies from different authors (Kleemeier, 2000; Warner et al., 1986; Njonjo and Lane 2002; Vezina, 2002; DeGabriele, 2002; Leroux, 2013 and Nicol, 1998). In 2000, Kleemeier reviewed 17 small rural gravity schemes with less than 120 km of pipelines. Results showed that the smallest schemes of less than 30 km were still supplying water after more than 15 years from completion. On the contrary, schemes which were newer but much larger provided less satisfactory water delivery. This was due to the fact that larger schemes not only required more periodic maintenance to detect and repair leaks, but also better management capacity of the water committee, which lacked in most cases.

Financial efficiency of the service delivery

In most cases, community was providing the water service while in a minority of cases, it was provided by the local government or external organisation such as NGOs. Where community acted as the service provider, a community based organisation (CBO) was formed with the purpose of achieving daily operation and maintenance (O&M) and cost-recovery from the tariffs collected. However, some of the cases faced challenges in tariff setting and collection. The key challenge in setting the right tariff was to cover not only the minor O&M costs but to be able to pay for major O&M repairs, as in the case of rural water projects in Ghana (Whittington et al., 2009). In terms of tariff collection, the government of Malawi (Warner et al., 1986) had promised the communities that they would receive water for free as long as they contributed time and labour at the construction phase. As a result, monetary collection for O&M was almost impossible and it led to suspension of water supply over a period of time or eventually, to the collapse of the whole system.

Sustainability of the service

In the history of community managed water supplies, small maintenance of the water system was within the capacity of the CBOs especially when the system was initially established. This was because many external organisations included capacity building as part of their programme to ensure the CBOs had the skills and resources to undertake minor O&M. Although these initial “boosters” could sustain the day-to-day operation for a period of time, for any scheme to be sustainable after donors withdrawal, continual external support and backstopping for community management would be needed. The lack of long term financial and institutional support after donor’s withdrawal from the programme were prevalent and pressing issues faced by majority of the case studies. Without the capability to finance themselves, it would be hard for CBOs to sustain the cost of repairs which eventually will lead to partial or a total collapse of the water system.

Community involvement

Involvement of the community in all stages of a water project is crucial for its long term success. When communities are involved at the early stages of the project, a sense of ownership is developed. This sense of ownership is essential for the community to accept responsibilities for maintaining their water system. In many cases, community were not consulted in the planning, designing and implementation phase (Department de l’Agriculture et de l’Agro-industrie, 2009; Peace, 1998). CBOs were generally involved in the post construction phase of managing the operation and maintenance of the system. Often, when the community was not involved in tariff setting, tariff collection because a challenge due to unwillingness to pay or unable to pay. Women’s involvement was found to be low in most of the case studies although they were usually the one responsible for fetching water in the household.

External support

There were various providers for external support such as donors, NGOs, governments and the private sector. Provision of capital cost for establishment of the systems was commonly found in majority of the success cases. However, not many cases received financial support on O&M and repair materials such as spare parts. Instead, many external support tend to focus in providing training on both technical and management aspects for capacity building of the community. In the context of a decentralised system, the local government was supposed to provide the technical assistance on maintenance and management as well as capacity building. However, due to limited financial and technical capacity, it was rarely implemented. Without continual external support like access to microfinance, loans or institutional strengthening, the performance of CBOs generally deteriorate over time.

Box 2. A negative effect of external support on O&M, Ghana [Case 20]

In 2005, over 224 villages with boreholes equipped with handpumps were evaluated in two regions of Ghana (Whittington et al., 2009). Most of the boreholes had been implemented through water supply programmes 6 years before the evaluation, and 90% of them were still working. However, the average waiting time between a breakdown and a repair was 18 days partly due to the fact that most of the villages had only one paid caretaker, some even none. Furthermore, although the water committees considered the amount of water tariff collected was enough for the daily operation of the systems, most of them agreed that, for major repairs, extra funding would be required.

This situation could be due to a lack of proper tariff collection system and accountability; however other factors proved to be more important. One of them was the belief that if major breakdown occurs, donors/external agencies would fund or support them. This situation appeared to be true: upon the completion of the project, 16% of the villages received grant from outside organisation for O&M, 21% received free repairs and 45% were helped with finding or receiving spare parts. Although this lack of incentive for collecting capital maintenance expenditure was also strengthened by other factors (e.g. lack of banking services to store safely the money), this expectation for external support seen as the answer to all the problems threaten the sustainability of those water supply systems.

3.2. OVERVIEW OF CASE STUDIES SCORES

In this section, an overview of the results from the scoring phase is presented. These results were first analysed based on their scores, in order to understand the level of success of the different case studies, and then evaluated based on the type of community management they presented.

3.2.1. ANALYSIS OF SCORES

All the 130 cases studies were scored according to the scoring system described in Chapter 2, and the results are presented below in **Figure 10**.

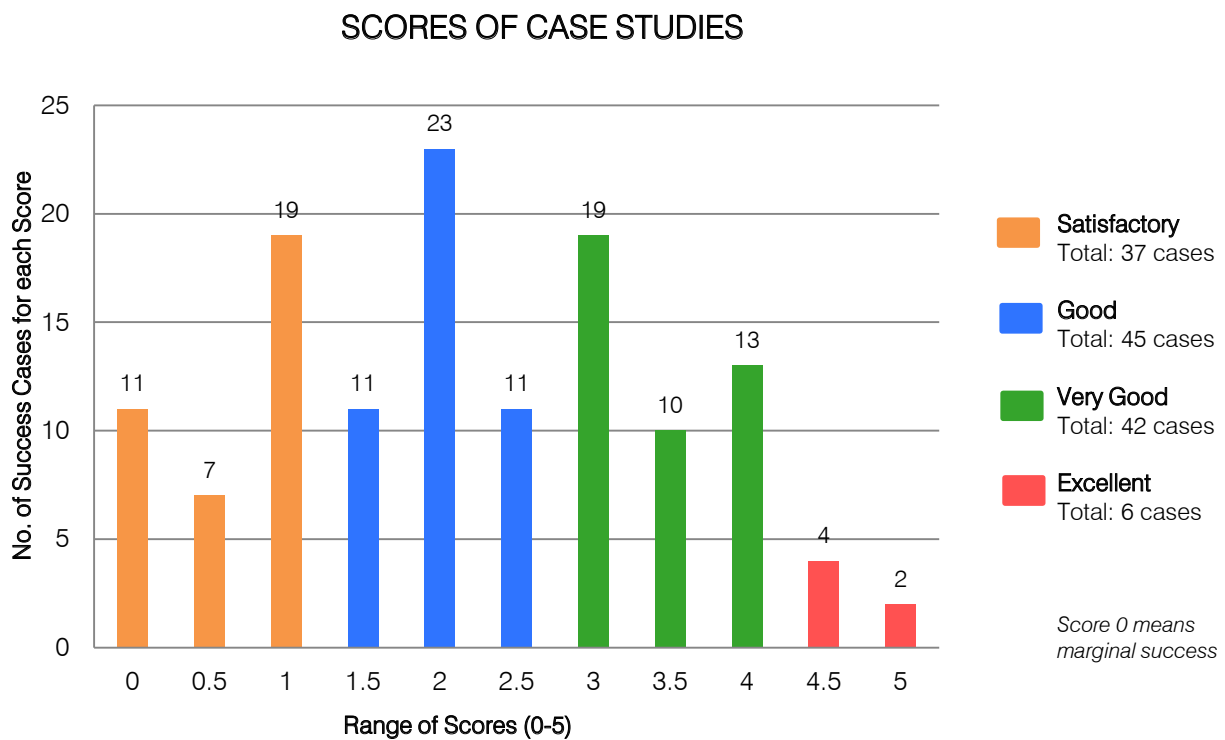


Figure 10. Results of the scoring of case studies

The dominant cases were scored from “Good” to “Very Good” (score between 1.5 and 4), being nearly two thirds of the total cases. The minimum score (0) represented a marginal success and was given to eleven cases. The highest score (5), representing a full success, was given to only two cases, all from cases with more than 5 years from completion.

Upon scoring, further analysis was performed in terms of the number of years of completion. All the case studies were categorised in four different completion groups in order to assess the level of sustainability. As seen **Figure 11**, the dominant cases were less than three years from completion, followed by those of more than five years. It was also found that only 4% of the case studies spanned over different completion groups.

YEARS FROM COMPLETION OF THE CASE STUDIES

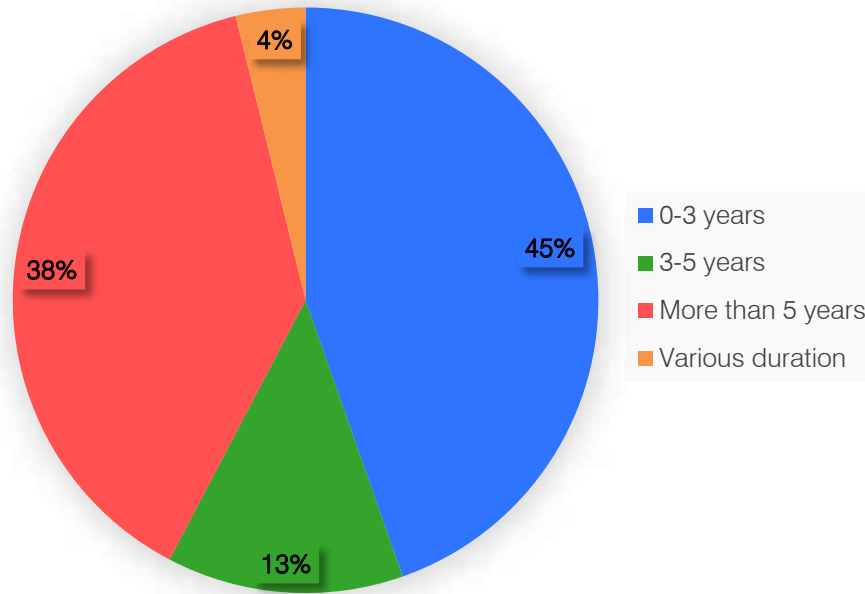


Figure 11. Proportion of case studies in different completion groups

In order to evaluate the relationship of the years from completion against the scoring results, a detailed analysis was done for each completion group, as shown in **Figure 12**.

LEVEL OF SUCCESS BY NO. OF YEARS FROM COMPLETION

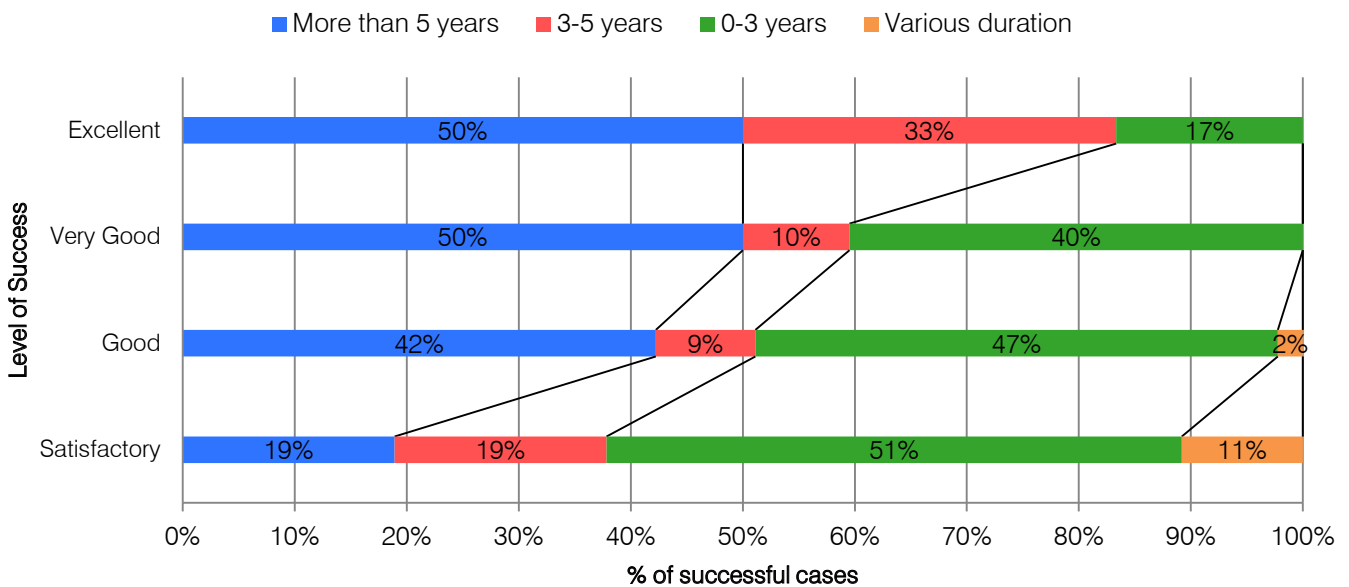


Figure 12. Level of success by number of years from completion

In the “Excellent” success cases, the ratio seemed higher as years from completion become longer than 3 years. When the sustainability of these cases existed, it was more pronounced, therefore the cases achieved higher scores. The detail factors that led to higher scores are investigated later in section 3.3. On the other hand, half of the cases scored as “Satisfactory” were cases evaluated less than three years after completion. Sustainability was harder to assess when the systems were recently implemented.

3.2.2. ANALYSIS OF TYPES OF COMMUNITY MANAGEMENT

Different approaches of community management of rural water supply exist, based on average income levels, costs of technology, development status and social context. Using these “community-engaged” approaches, the 130 case studies were categorised into three typologies:

- Typology 1* Direct provision with community involvement
- Typology 2* Community management with direct support
- Typology 3* Professionalised community-based management

For Typology 1, the community basically receives the direct support on finance, materials and technical issues from the government. Under the government’s control, the community is partially involved in operation and maintenance (O&M). For Typology 2, some cases have been legalised by the government as a “professionalised” organisation but they do not necessarily operate in commercial way. They are mainly responsible for O&M and normally utilise the local resources as materials and service providers. For Typology 3, the water systems are operated as an authorised business-like organisation.

Table 3 shows the detailed definition of these community management typologies and the number of cases categorised in each. From the 130 case studies analysed, some were classified in more than one typology as they presented several types of management; thus 149 cases were accounted for.

Typology	Direct provision with community involvement	Community management with direct support	Professionalised community-based management
No. of cases	20 cases	104 cases	25 cases
Definition	<ul style="list-style-type: none"> · Limited socio-economic capacity · High-level technologies and high cost of managing system · Provision of capacity development activities · Expectation for water committee to perform day-to-day duties · Low scale of community participation due to limited decision-making power · Significant requirement of external subsidy. 	<ul style="list-style-type: none"> · Capability of management aspects of system within community institutions · Model of CBO, typically an elected water committee carrying out all day-to-day tasks of O&M and administration of system · Sub-contract of some CBO tasks to an individual or a local company 	<ul style="list-style-type: none"> · More professional, competent and effective management of rural water services approaches · Agreed standards, and with greater transparency and accountability · Good business practices adopted to systematically O&M and management · Employment of trained staff

Table 3. Typologies of community management

3.3. SUCCESS VS. PLUS FACTORS

The first research question of this study was to investigate the Plus factors associated with successful community managed rural water supplies. Plus was defined as any add-on of community water supply to ensure the service continuity and sustainability. This Plus was evaluated from two perspectives: external support called “**External Plus**” and community empowerment called “**Internal Plus**”. External Plus was defined by investigating the external support, while the internal Plus was determined with the factors that encouraged communities to be an active part of the system.

For the evaluation of Plus, *only case studies scored above 3* (very good and excellent cases) were selected to be analysed. These 48 most successful case studies represented different number of years from completion, but the majority were from more than 5 years (**Table 4**).

Years from completion	0-3 years	3-5 years	More than 5 years	Total
No. of cases	18	6	24	48

Table 4. Number of cases by years from completion

These 48 most successful cases presented different types of CM, and sometimes a combination of two or more management modes. **Table 5** describes the distribution of the case studies by CM typology.

Typology	Direct provision with community involvement	Community management with direct support	Professionalised community-based management	Total
No. of cases scored above 3	2	39	18	59
% of cases scored above 3 over the total cases of the typology	10%	38%	72%	40%

Table 5. Number of cases by typology of community management

“Community management with direct support” was found in most of the successful cases (39 out of 59 cases), while only 2 cases presented “direct provision with community involvement”. On the other hand, when compared with the total successful cases within each typology, 72% of the “professionalised CBM” cases were scored above 3. This meant that systems managed in a professional way were likely to attain a higher level of success. In other words, the professionalised CBM could be a leading factor to success.

Box 4. Combination of internal and external plus in Kenya [Case 47]

The Ministry of Water and Irrigation of Kenya undertook a reform aiming at enhancing the capacity of the projects and ensuring the sustainability of the services (Mehta et al., 2007). Under this reform of the water sector, the communities became responsible for their water services, with support of the government.

A water committee was formed to manage the water system, and demonstrated a high level of involvement in the project (from fundraising to operating the system). All the community, particularly the women's group, were an active part of the project. They were provided with different forms of external support to assist with carrying out their responsibilities. This support included advice from the District Water Office regarding management and decision-making for major O&M issues, technical and financial assistance and enhancement of the capacity of the water committee.

This new form of water supply was operational for over 9 years since completion, and it illustrated the importance of both community involvement and external support.



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3.3.1. INTERNAL PLUS FACTORS

Internal Plus factors were analysed in order to determine the impact of the community’s involvement on the success of the project. Through the investigation of the 48 most successful cases (scored above 3, from very good - excellent), three types of “Internal Plus” factors were determined to be the key drivers behind the on-going motivation of the community (**Table 6**).

Key Internal Factor	Definition
High initiative	Self-help, sense of ownership, woman participation, creation of demand through choices of technology and service levels, participation in designs
Strong leadership	Supervision of workers, self M&E system, decision-making, setting work procedure
High transparency	Accountability, setting regulation, democracy in the community, disclosure of expenditure and tariff setting proces

Table 6. Definition of the key Internal Plus factors

The 48 most successful case studies were analysed in-depth to determine the importance of each Internal plus factor on their success. As shown in **Figure 14**, almost half of the cases were dominated by “high initiative” followed by “strong leadership” and “high transparency”

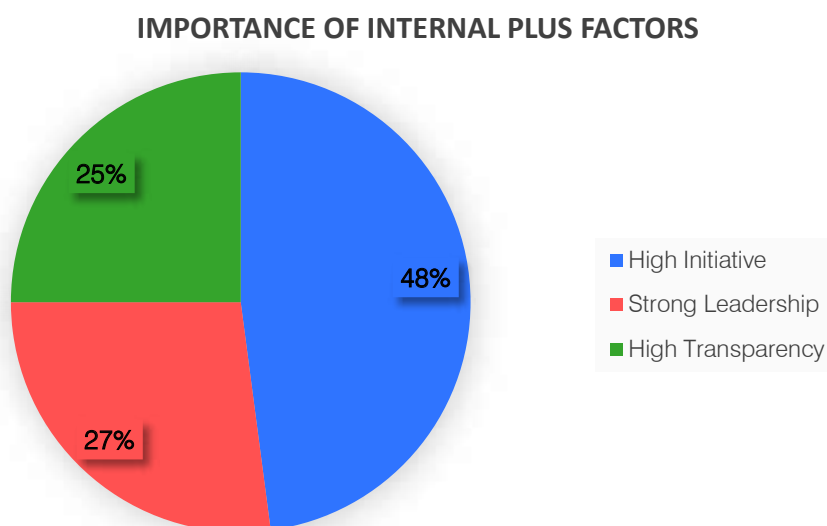


Figure 14. Importance of Internal Plus factors in most successful cases

This high level of community involvement seems to form the core of highly successful cases in CM water supply. Such participatory approach can be found at the initiation of the project, where the community contributes either with labour, materials or cash.

However, communities are not homogeneous or static entities. They are dynamic and ever changing and their ability to unite around a water project will depend to a great extent on the degree of social cohesion. A certain level of on-going motivation will be required to gel the community together over a length of time to ensure community will continue to deliver water services that last.

Box 5. Community Involvement at various stages

Evaluation of the case studies showed that involvement level in the community was relatively high from construction to O&M phase. Generally, participation involved contribution of labour, materials and cash for the construction of the system. In cases like Pakistan (World Bank & Azad Jammu and Kashmir State, 1995) and Nepal (Rai and Subba, 1997; ADB, 2013), communities participated at all stages of the project cycle including the initial stages of technology choice, system design and site selection. Early involvement of communities in project design not only improves the sense of demand (a measure of willingness to pay) but also begins the process of local ownership of projects, which were critical for achieving sustainability. In certain circumstances, water and/or sanitation teams were formed at the initial stage of the project cycle by either the project funder or a decentralised government system which consisted of government or external members and a couple of local community members. Post construction, the CBOs was then established with the support from the initial community to carry out O&M operations. In some exceptions, the initial committees stayed responsible for all stages from planning to post-construction management (Pasha and McGarry, 1989; World Bank, 2003).

A) INTERNAL PLUS FACTORS Vs. YEARS FROM COMPLETION

In order to determine the importance of the Internal Plus factors on the system’s sustainability, these three factors were evaluated based on its years from completion (Figure 15).

INTERNAL PLUS FACTORS Vs. YEARS FROM COMPLETION

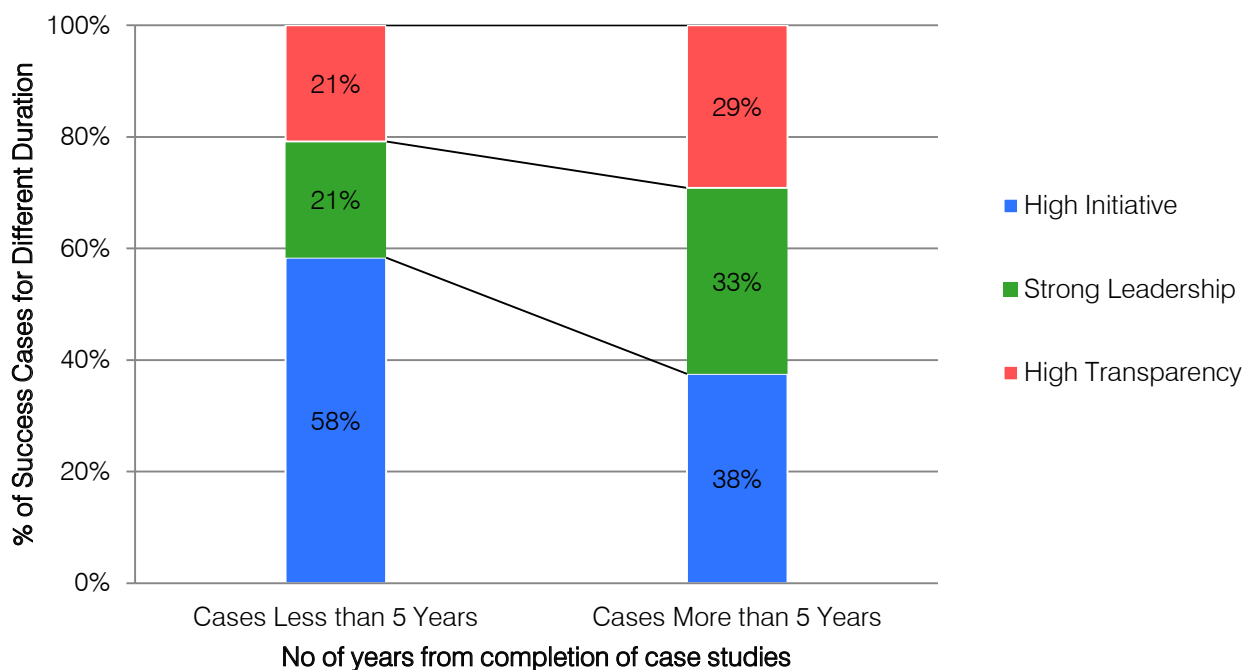


Figure 15. Internal Plus factors vs. years from completion

From this analysis, it was found that strong leadership was the key internal Plus for a sustained success (cases with more than 5 years from completion), while high initiative was more important for recent success. This demonstrates that a high initiative of the community is vital for the start of the project. However, in order to sustain it, a strong leadership and clear transparency should be added.

The longer the water system last, the harder it is to manage the water system as more attention is needed for O&M and effective cost-recovery. The presence of strong leadership with the right skills to manage the overall operation including human resources, management and finance, could guide and drive the community in delivering sustainable services. In terms of transparency, the committee needs to demonstrate to the community the basis behind setting the tariff and report on how the money will be spent. If the community have doubts about the system, tariff collection would become a challenge.

Box 6. Community leadership and initiative in Monduli Water Supply, Tanzania [Case 37]

Thanks to a loan from the African Development Bank, the government of Tanzania implemented a project between 2004 and 2009 in 18 villages of the most arid areas of the country (AfDB, 2009). During the project, 22 boreholes, 17 new dams and 8 gravity schemes were constructed and 8 old dams were rehabilitated, supplying to around 100,000 people.

The early success of the project, five months after completion, seemed to be attributed to the emphasis put on the training of the water user association and community leaders regarding the sustainable management of the water schemes (e.g. bookkeeping skills, transparent management of the funds, management of O&M, etc.). Moreover the high initiative within the community and the involvement of women in the management of the water schemes (i.e. women represented 45% of the Water user association members) were key factors in the success of this project.

B) INTERNAL PLUS FACTORS Vs. TYPOLOGY OF COMMUNITY MANAGEMENT

In order to determine the importance of the Internal Plus factors on the system’s management, the three characteristics were evaluated based on the management typology (Figure 16).

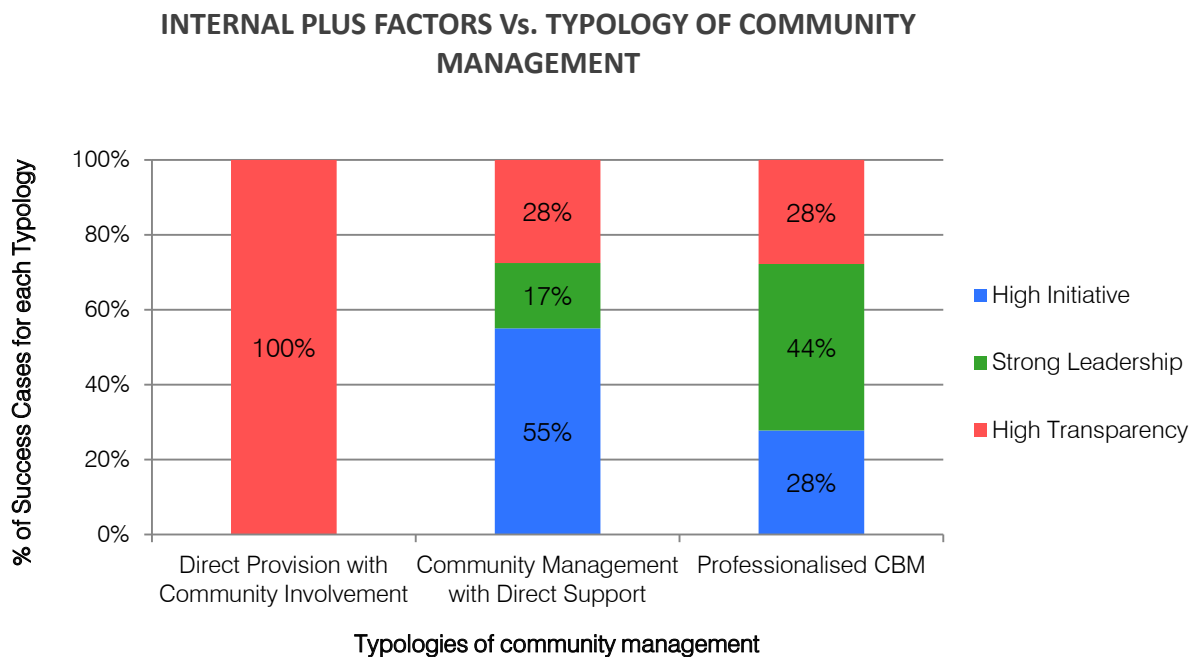


Figure 16. Internal Plus factors vs. typology of community management

A key factor for the “direct provision with community involvement” model is transparency. Under this typology, in many cases the CBOs were responsible for O&M using funds from tariff collection. They were required to report the progress of the project, especially the disclosure of the financial status to the project donor.

On the other hand, strong leadership was a relevant factor for professionalised CBM. When the scores were analysed according to the community management typology, it was observed that the sustained projects tended to have higher scores in the professional CBM. This lasting success could be a result of this leadership plus factor, since leadership becomes of high importance for the project’s sustainability with time. Without a doubt, community initiative formed the building block behind “community management with direct support” model. This model could evolved to the next stage as “Professionalised CBM” with effective utilisation of External Plus factors to enable upgrade of the service delivery.

Box 7. Unique, high, long-term initiative in Bishashaya village, Nepal [Case 6]

The gravity flow water scheme of Bishashaya village, in Nepal, completed in 1994 (Rai and Subba, 1997), was one of the most successful community-managed cases. In this case, the community motivation to participate actively in the drinking water scheme was unique. Since drinking water was seen as a priority, Bishashaya village felt a real need for safe water supply and was highly involved in the project since its beginning. Not only was the project initiated by the community itself, it was also implemented with the help of the community (both fundraising and contribution of labour) and, once completed, managed and operated by the community. This high, long-term initiative resulted in a good management of the water system, and was key to making the project successful and sustainable.

3.3.2. EXTERNAL PLUS FACTORS

In addition to Internal Plus factors, External Plus factors were analysed in order to determine the impact of the external support on the success of the project. This analysis was done considering eight different forms of external support (Table 7).

Forms of external support	
1	Financial Support for different expenditures and Provision of Materials from External Organisation
2	Capacity Building on Technical Skills
3	Capacity Building on Management
4	Access to Advice on Technical Issues
5	Access to Advice on Management and Finance
6	Access to Loan and Microfinance from External Organisation
7	Access to Supply Chain of Spare parts and Service
8	Decentralised System/Regulatory Framework (including M&E)

Table 7. External Plus factors considered

Each one of the 48 most successful case studies was assessed according to these eight forms, and more than one item was applicable for most cases. Figure 17 includes the result of this assessment, and shows the number of cases presenting each external plus item.

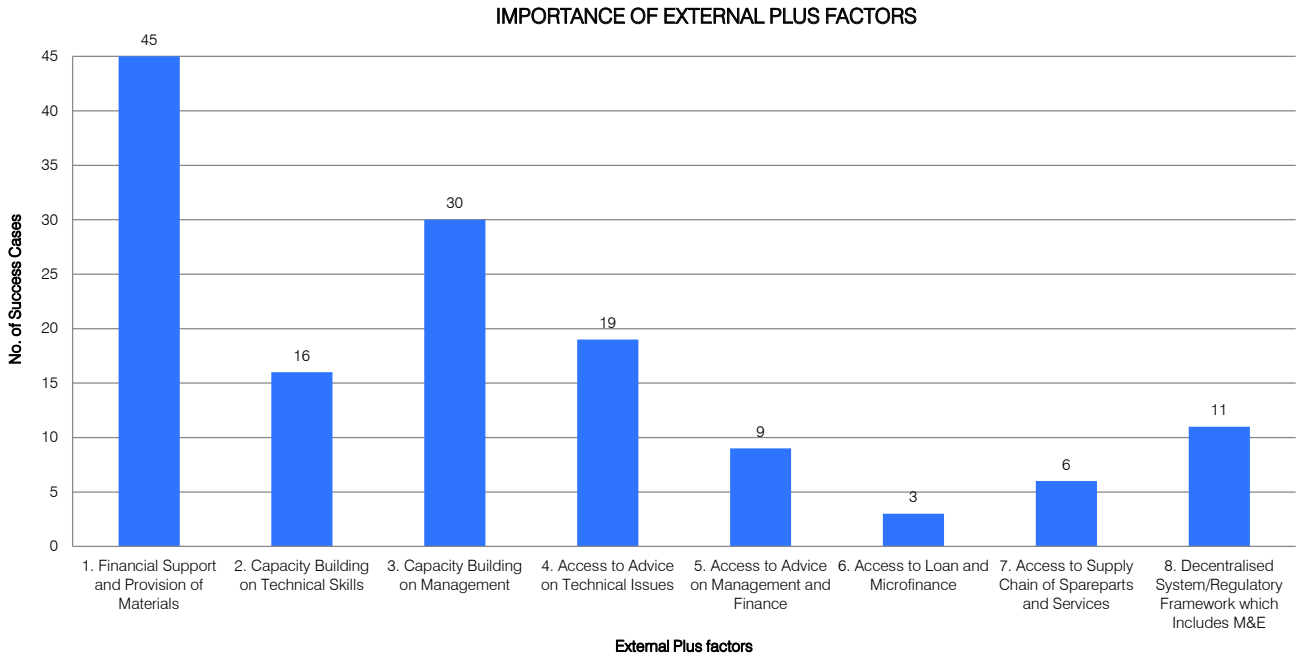


Figure 17. Importance of External Plus factors in most successful cases

It was found that among the 48 most successful cases, 45 cases received financial support for different expenditures (capital expenditure, operating expenditure and capital maintenance expenditure) and provision of materials from external organizations. Capacity building on management was also provided to more than half (30 cases). On the other hand, one third (19 cases) could seek advice on technical issues related to O&M from the external organization. However, only a few (3 cases) had access to the scheme of loan and microfinance, and these cases were found particularly in Asian countries like Pakistan (ADB, 2008; Padawangi, 2010) and China (World Bank, 2002).

Box 8. Access to microfinance for income generating activities using time saved from fetching water, Pakistan [Cases 13,23 and 25]

Punjab is the most populated province of Pakistan and more than half of the population live in the rural areas. The level of investment in water supply and sanitation (WSS) sector is low compared to other sectors, especially in the rural areas. In 2003 – 2007, Asian Development Bank (ADB, 2008) funded this project as a sector loan of \$56.1 million under the overall framework of the Government's poverty reduction strategy. The Project benefited a population of about 2.6 million through sanitation facilities and pump/gravity based water supply with some villagers chosen to install metered water supply.

Besides improving the water and sanitation facilities of the locals, ADB also implemented a social uplift and poverty eradication programme (SUPER) through aimed at using the time saved from fetching water (aimed particularly at women) for more productive uses through a microcredit program. The microcredit intervention was designed to introduce the use of group-based microfinance to support income generating activities on a self-help basis, with the support of women's CBOs. Through this programme, ADB had loan 213 borrowers in 38 CBOs for setting up of various income-generating activities such handicrafts, embroidery and carpet and rug weaving. Eventually these communities were linked to local microfinance institutions (MFIs), e.g. local banks, which would continue to provide microcredit after loan closing.

In the initial project completion report done by ADB in 2008, it was reported that such linkages with MFIs such as Khushali Bank (KB), National Rural Support Program (NRSP), Punjab Rural Support Program (PRSP), and Punjab Small Industries Corporation (PSIC) were developed. The linkage with these MFIs proved to be very successful within the span of 12 months prior to loan closing, with an increase of 14,725 borrowers to 17,617. These MFIs was supposed to continue to provide microcredit after loan closing. However, an independent evaluation report in 2009 conducted for ADB indicated that time saved from fetching water did not translate into increased income. Padawangi (2010) had also challenged the actual impact of the SUPER programme versus what was reported back in 2009. There was lack of evidence of uptake in the community of the SUPER programme. This programme support in linking with service providers, including microfinance institutions, was of little relevance in the project context due to prior strong presence of microfinance institutions. While this add-on component had the potential to improve project performance, it had proved less relevant due to lack of the needed skills need in implementing agency.

Box 9. Community management coupled with access to spare parts and management/ financing assistance [Case 76]

The Midre-Genet piped water scheme in Ethiopia had been providing safe water supply to more than 15,000 people for more than 25 years (Heap, 2006). The main reason for this long-term success was the strong community management, with a dedicated and trained water committee. In addition, access to spare parts and external support for service management and finance also contributed to the long-term success of the service.

Since the scheme included motorised boreholes and pipeline distribution, the access to spare parts and tools was essential for its operation and maintenance. The location of Midre-Genet and existence of funds for O&M had allowed the communities to access the market of spare parts, replacement of equipment and repair services. This easy access to spare part at the local level had been key to the technical sustainability of the water supply scheme.

Access to assistance on management and financing was also crucial for the sustainability of the system. Both the regional government and the local water offices advised the community on several aspects related to the management and financing of its system. This advice included the formation of the water committees, the setting of appropriate tariffs and the establishment of a transparent and accountable financial system. The strong community management, coupled with this access to spare parts and to assistance on management and financing played an important role in the sustainability of the Midre-Genet water scheme.

A) EXTERNAL PLUS FACTORS Vs. YEARS FROM COMPLETION

In order to determine the importance of the External Plus factors on the system’s sustainability, the eight forms were evaluated based on its years from completion (**Figure 18**).

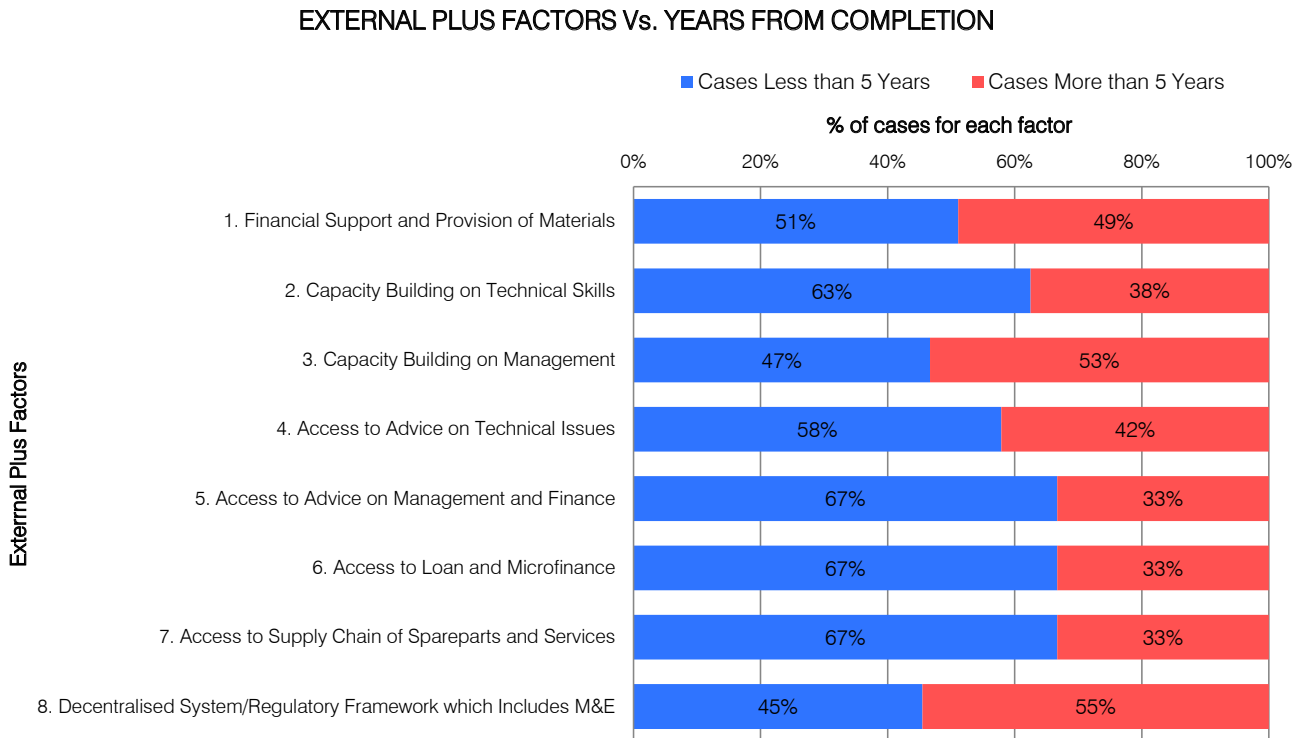


Figure 18. External Plus factors vs. years from completion

Based on the results shown above, cases which were less than 5 years from completion required more access to “advice on management and finance”, “loan and microfinance” “supply chain of spare parts and services” and capacity building on technical skills. This is probably due to when a water system is young, such external factors were available as the project might still be “energised” by the fundings from the donors. On the other hand, external factors such as “financial support and provision of materials” and “capacity building on management were found equally important in both younger and older systems.

Lastly, cases with more than 5 years from completion had higher percentage of “decentralised system/regulatory framework” . This result could be an indication that the presence of governmental support through decentralised system and reformed policies helped create an enabling environment to sustain CM water system.

Box 10. Decentralised support to Bishashaya village, Nepal [Case 6]

The Bishashaya water supply scheme was part of the Rural Water Supply and Sanitation Project (RWSSP), a bilateral development project funded by the government of Nepal and Finland (Rai and Subba, 1997). However, instead of being executed at a national level by the government staff, it involved the District Water Supply Office (DWSO). The staff of this district agency supported the community from implementation (technical and material assistance) to operation and maintenance (training, monitoring and evaluation). This decentralised long-term support provided locally appropriate and coordinated assistance, and enabled the community to be more prepared in managing their water system.

B) EXTERNAL PLUS FACTORS Vs. TYPOLOGY OF COMMUNITY MANAGEMENT

In order to determine the importance of the External Plus factors on the system's management, the eight characteristics were evaluated based on management typology (**Figure 19**).

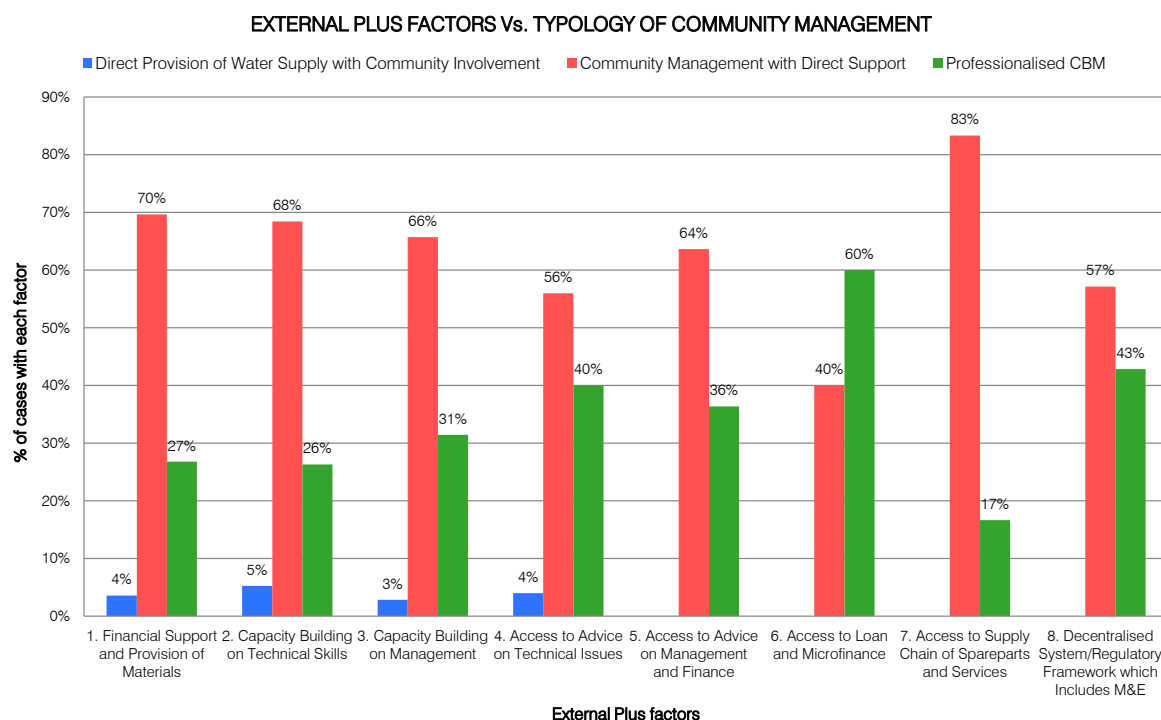


Figure 19. External Plus factors vs. typology of community management

The “CM with direct support” required various forms of external support, from financial support to advice on technical/management. On the other hand, the professionalised CBM required more “enabling” support (e.g. access to loans and regulatory framework). However, no advice on management, access to microfinance and loan or to supply chain were observed in the “direct provision with community involvement” model, but were observed in the other two community management types. This is likely due to the fact that external organisations tend to be in charge of most part of the system, therefore the need to provide support to the communities is seen as less important.

Another key finding of the External Plus factors is the importance of decentralised system/regulatory framework in the “Professionalised CBM” model. This importance of a strong enabling environment increases when the community starts managing the water system in a more professionalized and legalised way. Therefore, a regulatory body for CBM could be a key external support factor to ensure the success of the community-managed water system.

Box 11. Impact of regulatory framework on El Ingenio supply, Peru [Case 81]

A gravity-fed water system managed by the Water and Sanitation Association El Ingenio (ASAP El Ingenio) in the rural District of El Ingenio provided water to 10 villages since 1995 (WSP, 2001).

The supporting system from the government was responsible for this good service level. In 1995, after the project was completed, the management of the system was transferred to the community. External financial and technical support was provided to the community in order to undertake O&M, but it struggled to fulfill its responsibilities. As a result, the users formed a water board (ASAP El Ingenio) in 1997, after 7 months of training provided by an external NGO. As ASAP El Ingenio was legally recognised, the governing council responsible for water supply required them to follow accountability and efficiency standards. Assemblies were organized with the government to approve financial performance, work plan, budget and rapid action to service repairs. Thanks to the regulatory framework in place, the community improved its performance.

3.4. SUCCESS VS. SOCIO-ECONOMIC SETTING

This last section of the study was dedicated to the second research question of the project: is the socio-economic setting indicative of the likely success of a community managed rural water supply?

As detailed in the methodology section, the scores of the case studies and GDP data (regional GDP and GDP per person based on PPP) were plotted against time for four regions:

- Sub-Saharan Africa
- Latin America and the Caribbean
- Middle East, North Africa, Afghanistan and Pakistan
- Developing Asia

However, in practice, 18 of the 21 case studies for the Middle East, North Africa, Afghanistan and Pakistan region were located only in Pakistan, and it was therefore chosen to focus on this country to present the results of the region. In addition, it was considered that the number of cases analysed for Developing Asia was not sufficient to compare the evolution of success with the economic growth (less than 6 cases for each completion group). The results that are not detailed in this section can be found in the **Socio-Economic Spreadsheet**, which can be found in **Appendix B**.

The findings were interpreted in a systematic way, looking at some indicators of the success framework that were related to financing and management of the systems. These indicators are described in **Table 5**.

Indicators	What was looked for?	Potential link with GDP per person
Internal financial resources	Do users contribute financially to the system?	The ability to contribute to the system can be linked to the community's wealth
External financial support	Did the project receive grants, loans or other funding from governments, NGOs or donors?	Governmental support can be linked to the country's wealth
Quality of community management	Are O&M and accountability done in a professional way?	High quality of community management could be linked to a high human development (being HDI and GDP per person correlated)

Table 5. Description of the indicators used for the socio-economic findings

The following paragraphs highlight the results that are relevant for each of the region studied, and the proposed interpretations of these findings. GDP per person graphs were chosen as they also reflect HDI graphs and these two indicators are strongly correlated (Gapminder, 2011). Nevertheless, the GDP graphs can be found in the full Socio-Economic spreadsheet.

3.4.1. LATIN AMERICA AND THE CARIBBEAN

FINDINGS:

Out of the 130 case studies, the majority were from more than 5 years completion group hence they were chosen for analysis of scores against the economic growth (**Figure 20**). The longevity and scores of these cases represented sustainability of a water system, proved to be a valuable source for evaluation against time.

Except for a very successful case study done by Water and Sanitation Program in 2001 and a less successful one done by Suzuki in 2010 that were outliers and therefore not considered for constructing the graph, the scores seemed to follow the trend of GDP per person over the years.

LATIN AMERICA AND THE CARIBBEAN

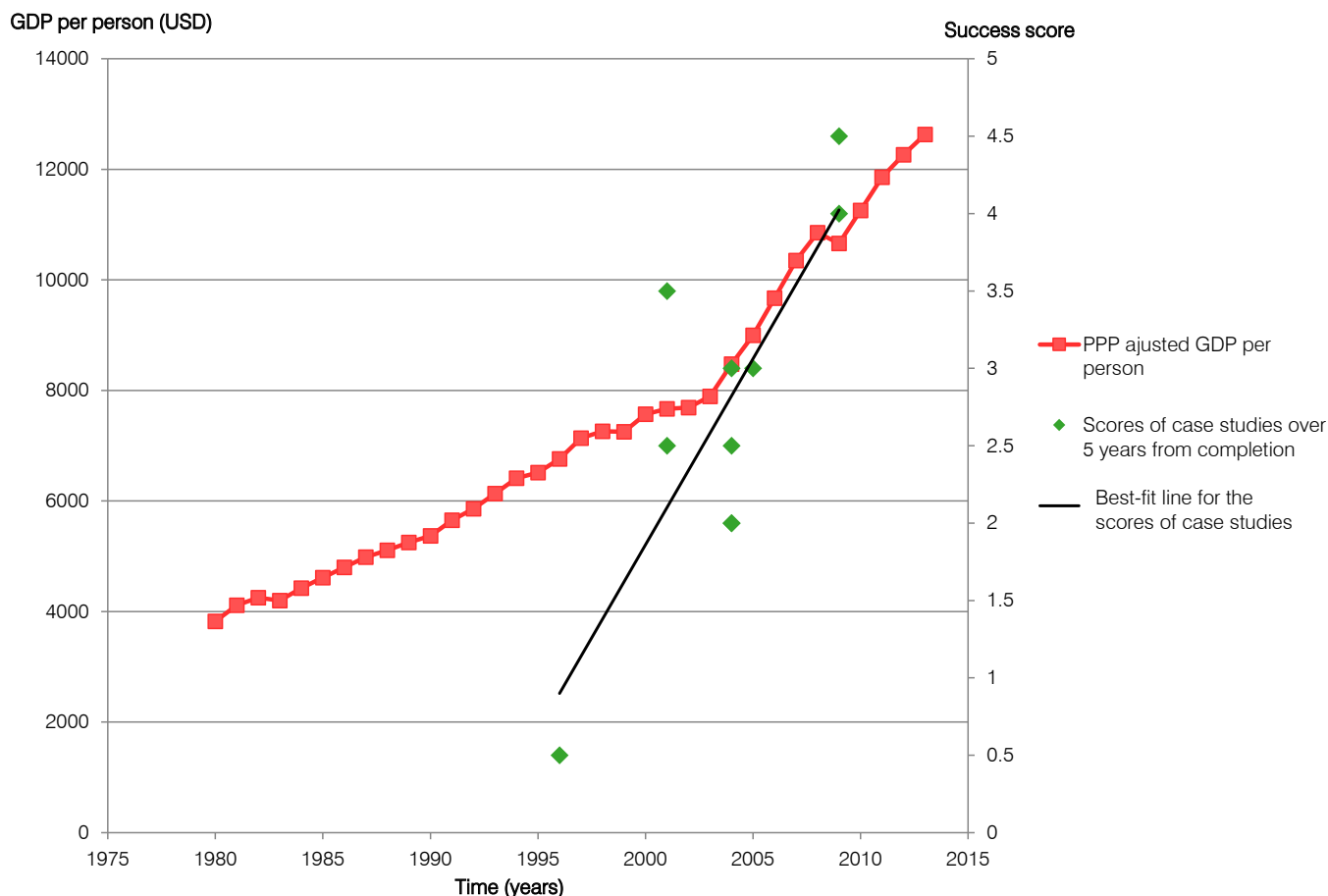


Figure 20. Success vs. GDP per person in Latin America and the Caribbean

INTERPRETATION:

In all the case studies of Latin America and the Caribbean with more than 5 years from completion, users were contributing financially to receive the water service, and the financial management of the system was effective. This had allowed to cover not only operation and maintenance expenses, but also major repairs, except for the less successful case (Suzuki, 2010). The ability of the users to contribute depended on diverse factors, amongst them their wealth, roughly estimated by the GDP per person. On the other hand, all communities were financially supported. However, no common external support was identified, as it was provided by different actors (NGOs, international financing institutions, governments).

Finally, among the 8 most successful cases, with score above 3 (Whittington et al., 2009; World Bank, 2001; Stalker Prokopy et al., 2009; Davis et al., 2009; Water and Sanitation Program, 2001; Madrigal-Ballesteros et al., 2013), 4 cases seemed to be run in a professional way with well-trained staff dedicated to the operation and maintenance of the systems and/or efficient and transparent accountability. This could be linked to a certain level of education and development in the region, reflected by the HDI, that makes the users act like clients and the provider like a company.

Box 12. Water User Association management in Sucuneta, Colombia [Case 80]

Sucuneta multi-village scheme (WSP, 2001) implementation started in 1997 and in 2000, it had 1,350 connections serving 11,100 people from 15 villages.

The system was managed professionally by the Water User Association which had hired a manager, a supervisor, four plumbers, two plant operators, a secretary and an accountant, among the community members. This committee was also responsible for disseminating financial data to the users and proposing the budget.

This case was given a high score as it achieved high levels of sustainability and transparency.

Box 13. Professionalised management in Latin America

In some of the highly successful cases, CBOs operated the water system in a more commercial or professional way such as paying for the staff, preparing annual budget plans, disclosing financial information.

Such professionalised way of operation seemed to be the prevalent practice adopted by most of the Latin American countries such as Bolivia (Lockwood, 2004 pg. 49-50; Davis et al., 2009), Columbia (WSP, 2001 pg. 8-11), Costa Rica (Madrigal & Alpizar, 2011; Madrigal et al., 2013), Guatemala (Centro de Servicios para el Desarrollo -Quetzaltenango, 2001), Honduras (Lockwood, 2004 pg. 53-54; Casey 2005), Paraguay (World Bank, 1991) and Peru (WSP, 2001 pg. 12-13; Whittington et al., 2009).

Evidences from majority of existing community managed systems showed that getting the right balance between various dimensions (technical, financial, institutional, transparency and replicable) was essential for long term sustainability.

3.4.2. PAKISTAN

FINDINGS:

Most of the case studies evaluated from Pakistan were from less than 3 years from completion. However, the most successful cases (scored above 3) described good financial support from the government and good contributions from the communities and were perceived to have a high potential sustainability. Once again, the trend lines for the GDP per person and the scores presented a similar behaviour (**Figure 21**).

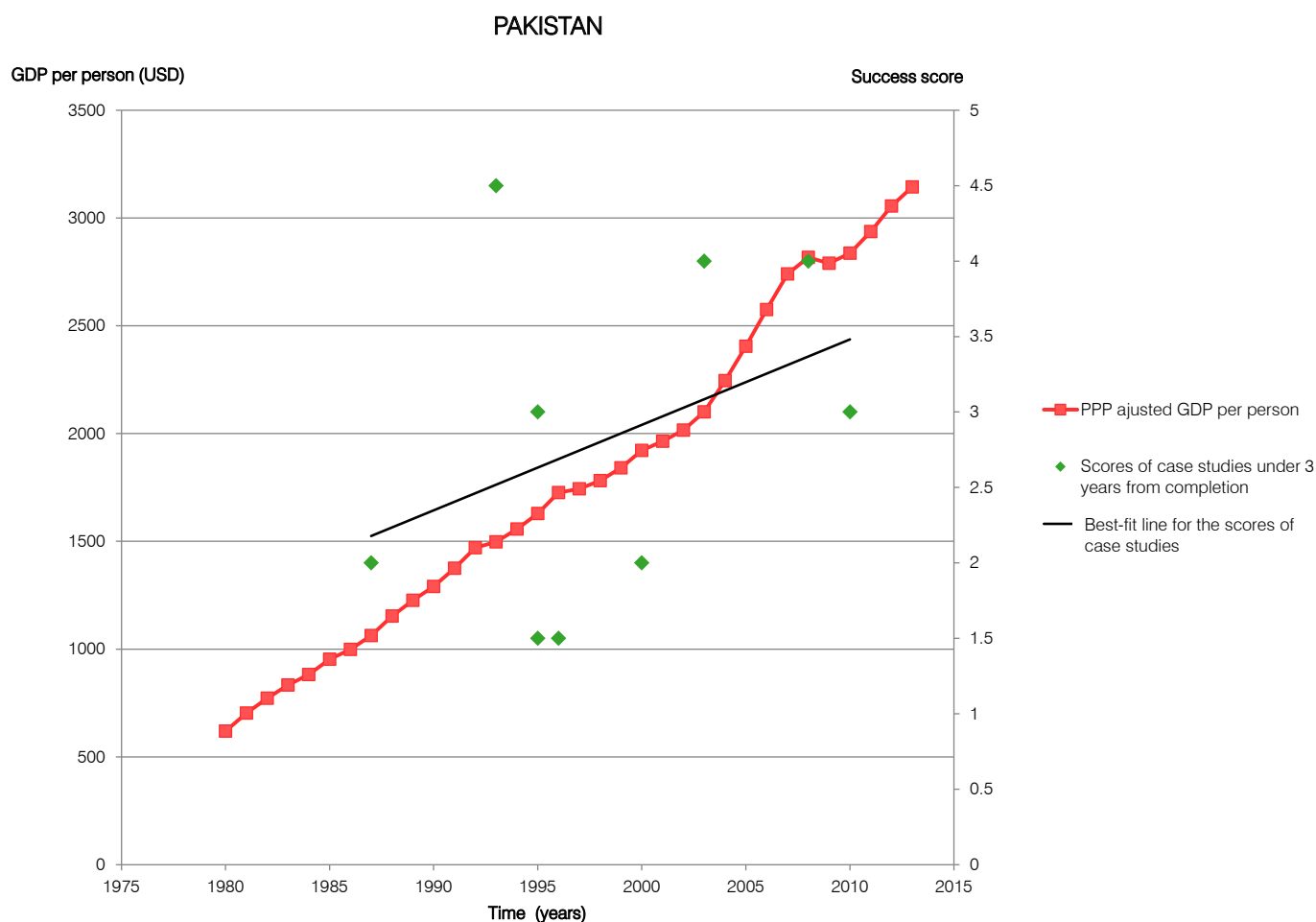


Figure 21. Success vs. GDP per person in Pakistan

INTERPRETATION:

Most of the systems evaluated in Pakistan relied on tariffs and bill collection to finance O&M. Like in Latin America and the Caribbean, an increase in general wealth could partially explain the better finances of the most recent projects. Once again, they were supported by government, NGOs, donors, international agencies and banks, without any common financial external support.

3.4.3. SUB-SAHARAN AFRICA

FINDINGS:

For this last region, socio-economic indicator did not seem to be indicative of the success of the case studies. The scores were almost equally distributed around the mean of 2.5 (**Figure 22**), and a wide range of scores was observed for every year. The same observation was found for case studies evaluated less than 5 years after completion of the projects (which can be found in the Socio-Economic Spreadsheet presented in **Appendix B**).

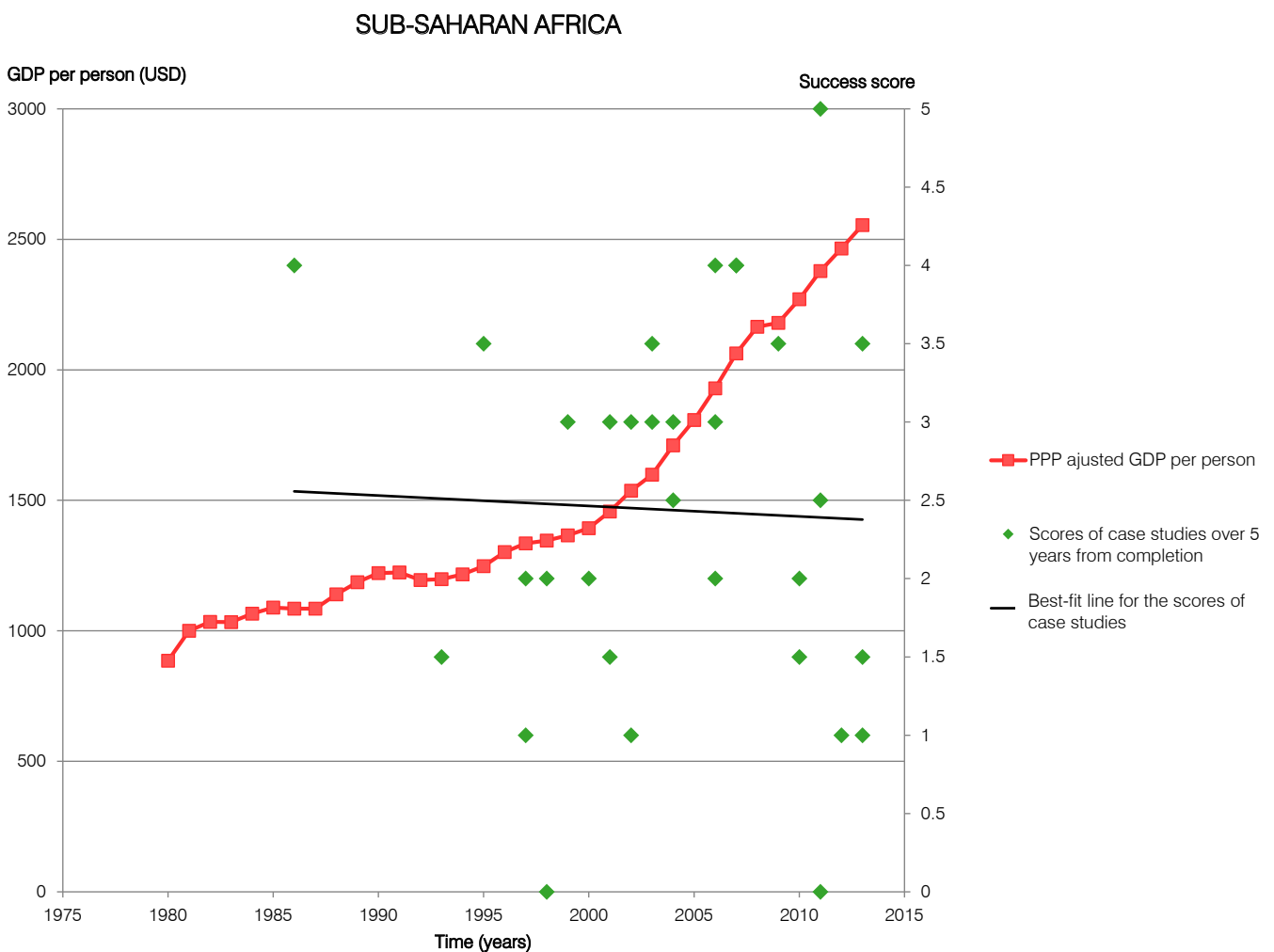


Figure 22. Success vs. GDP per person in Sub-Saharan Africa

INTERPRETATION:

These findings could be explained by the high heterogeneity of the Sub-Saharan region, where countries showed big differences of economies (from farming to oil production), development stages and political stability. Due to such varying circumstances, two countries were picked for in-depth examination in order to detect socio-economic trends against scores of the case studies. As a result, a graph was plotted for Ethiopia (5 case studies written less than 3 years after completion) and Uganda (4 case studies written more than 5 years after completion), to investigate whether the variations in the scores would be observed again.

Although the number of case studies was not enough to give relevant results, it was observed that the limited number of scores plotted varied less than for the region as a whole and showed a slight increase with GDP per person (**Figure 23**).

ETHIOPIA AND UGANDA

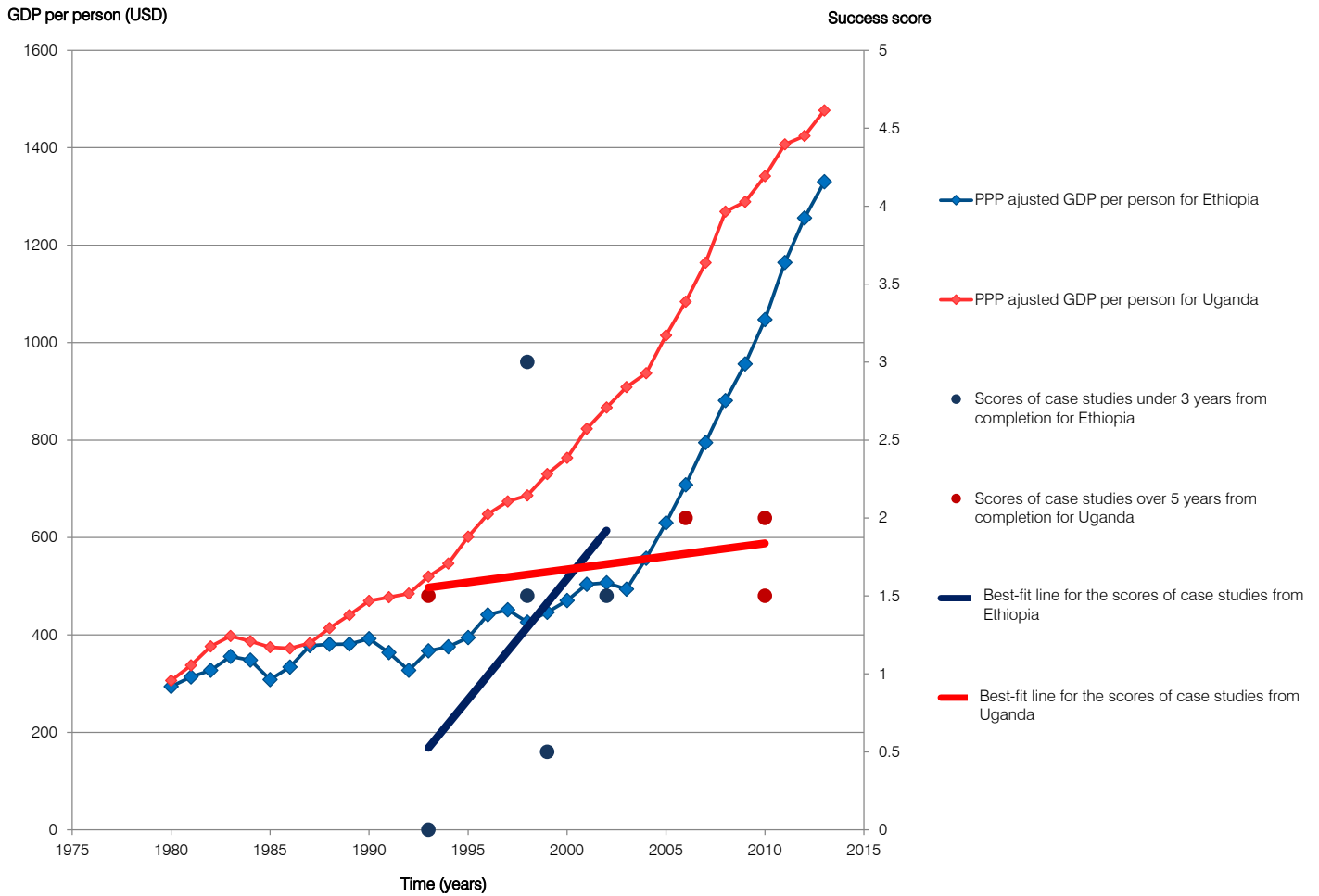


Figure 23. Success vs. GDP per person in Ethiopia and Uganda

The high variability of the scores over time could also be explained by the heterogeneity of financial resources available for the systems. A lot of case studies reported a lack of tariff setting and bill collection. In these cases, the financial resources were not linked to the wealth of the communities and only came from external support. This is why the success was not following the economic trend.

The heterogeneity of the results could also be due to the different levels of technology installed, which varied from boreholes to gravity-fed systems, and protected springs and reservoirs, contrary to Latin America and the Caribbean, or Pakistan, where most of the schemes were piped systems.

Box 14. Successful community management in Africa, a heterogenous situation*Tereta gravity water supply, Ethiopia [Case 98]*

Tereta's gravity water system supplies 52,000 people over 15 villages (Reed, 2011). The system was constructed between 1992 and 1995 by the government of Ethiopia in partnership with the NGO Water Aid to reduce the time of water collection and the effect of water shortages. The contribution of the community in the assets construction in financial terms was low. However, thanks to a high motivation and labour, from both men and women, the construction phase which was planned for 5 years was completed in 3 years.

Some members of the community were trained on finance and technical aspects during the implementation, and village committees were formed. Water tariffs were covering the cost of water as well as the bureaucracy needed to manage the system. The management of the scheme was organized and divided in four entities with different responsibilities, all including people from the community: Village Committees, Management Board, Administration team and Tap Attendants.

In 2001, six years after the project completion, the system is working well despite some minor leaks. Financially, the system was generating profit and allowing every member of the community to access water, as the tariff was lower than the ability to pay of the poorest people in the community. Moreover, family relationships, cultural and religious aspects of the community had ensured the payment of water bills. Accountability was managed at the scheme level by the water board, so the control was in the hands of people who were motivated to keep the scheme operating. In this situation the government had only a role of support through periodic financial audits and dialogues with the community, strengthening the financial sustainability of the system. Water Aid is still supporting the schemes by assessing the management and providing procedures regarding human resources and tariff setting.

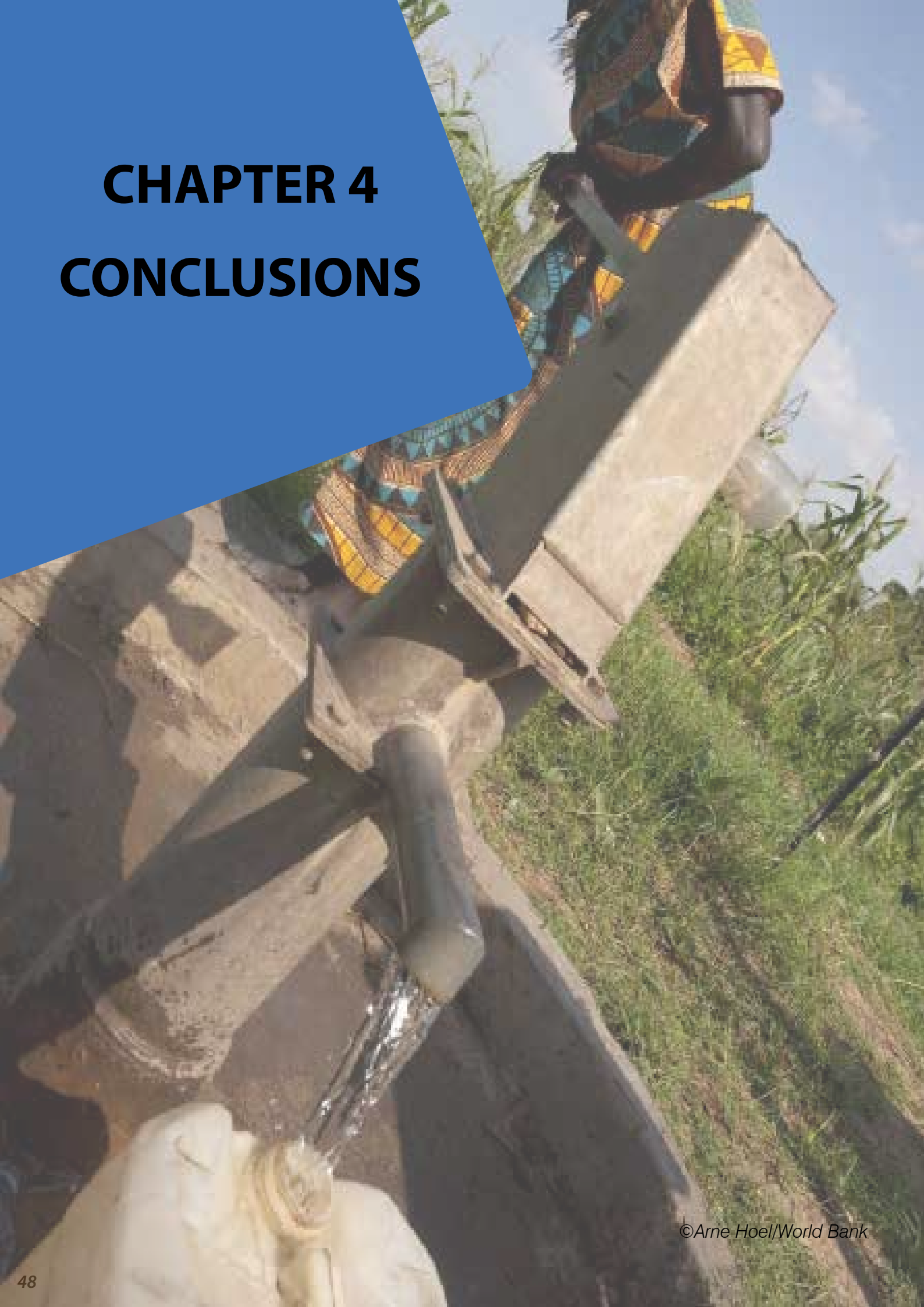
Nganiko Gravity Flow scheme, Uganda [Case 121]

Nganiko Gravity Flow scheme supplies 2,880 people from a community in Kamwenge district in Western Uganda (Waako and Mwaka, 2001). It was constructed through the Health through Water and Sanitation (HEWASA) programme of the Catholic Diocese of Fort Portal between 1998 and 1999. A central committee responsible for the management and maintenance of the system was set up as well as a tap committee in charge of the tap maintenance and tariff collection.

In 2001, two years after the completion of the project, although water was still flowing, the lack of accountability threatened the system sustainability. The community members was aware of the need for O&M payment but the transparency regarding the use of the funds was low. No meetings were held between the management team and the community, and even meetings within the management team were irregular. As a consequence the water tariffs were not paid by the community leading to important breakdown periods, a lack of O&M and a degradation of the system.

CHAPTER 4

CONCLUSIONS



The aim of this study was to review the history and critically analyse the development of successful community management for rural water supplies over the past thirty years. This critical analysis involved an evaluation of the “Plus factors”, or add-ons that contributed to the success of these community managed supplies, and an assessment of the impact of the socio-economic setting in this success.

Evaluating the “Plus factors” provided insight into the type and extent of add-ons required to sustain community water supply. Two different types of “Plus factors” were evaluated: internal factors, related to communities themselves, and external factors, related to the external support to communities. And this evaluation resulted in a list of key factors (**Table 6**).

Internal Plus factors	External Plus factors
<p style="text-align: center;">Leadership</p> <p>Key for sustained success and professionalised management</p>	<p style="text-align: center;">Regulatory framework</p> <p>Key for sustained success and professionalised management</p>
<p style="text-align: center;">Initiative</p> <p>Key for immediate success and directly-supported management</p>	<p style="text-align: center;">Access to advice (technical/managerial)</p> <p>Key for immediate success and all type of management</p>
<p style="text-align: center;">Transparency</p> <p>Key for overall success and management</p>	<p style="text-align: center;">Financial support</p> <p>Key for overall success and directly-supported management</p>

Table 6. Key Plus factors identified in the case studies

For immediate success of the water supply scheme, a *high initiative* of the community was essential. When community members were an active part of project, the system was better implemented and managed. However, *leadership* of the management body was vital for the long-term success. Committed, accountable and inspiring leadership was what provided the motivation to continue maintaining and managing the water supply. On the other hand, *access to external advice* (both technical and managerial) was found to be important for the immediate success, since it helped the communities overcome the initial management issues. Nevertheless, in order for the communities to sustain their water supply, a *regulatory framework* was essential. Sustainability of community management required not only direct support, but also appropriate government policies and regulatory environments.

Such key Plus factors helped the communities move from a simple directly-supported to a professional management, where they operate their systems in a commercial-like way. This professionalisation of CM allowed communities to provide cost-efficient, well-planned and long-lasting services.

Overall, the “Plus” created a good, “*enabling*” environment for the water supplies to be successful and sustainable. When this environment existed, as in Latin America, the Caribbean and Pakistan, community management was more professionalised and delivered good and sustainable services. In its absence, such in the case of Sub-Saharan Africa, CM struggled to provide long-lasting services.

However, it was found that a certain *level of economic wealth* was also required to achieve this success. In regions like Latin America and the Caribbean, where this wealth existed, the economic growth was indicative of the success of community management; while in regions like Sub-Saharan Africa, where this wealth lacked and community management relied mostly on external support, the success was random and could not be linked to wealth.

In conclusion, this study has showed that for community management to be successful, a certain level of socio-economic wealth is necessary, but not sufficient. A combination of different Plus factors, both internal and external, is also needed to make the community management approach sustainable and successful.

APPENDICES



APPENDIX A - SUCCESS FRAMEWORK

CASE STUDY INFORMATION
This category included general information about the selected case study in order to be easily identified
Year of completion
Year when the water supply system was completed
Year of analysis
Year when the water supply system was evaluated
Years from completion
Difference between year of completion and year of analysis
Location
Country where the case study took place. This information was important to create, later on, the socio-economic graphs
Category
A, B or C. "A" representing case studies which years from completion were between 0 and 3 years, "B" between 4 and 5 years and "C" over 5 years. This information was coded differently in the socio-economic graphs

WATER SUPPLY SYSTEM
This category included information about the water supply system of the case study and the services provided
Technology
<ul style="list-style-type: none"> - Infrastructure: type of water supply system (e.g. borehole with handpumps/motorised pumps, gravity flow piped systems, etc.) - Complexity: of the water supply system implemented, it was characterized as High, Medium or Low
Service level
<ul style="list-style-type: none"> - Quantity of the water: in litres per capita per day - Quality of the water: direct (e.g. analysis of the quality) or indirect (e.g. evolution of waterborne diseases occurrence) data - Coverage of the population targeted (e.g. percentage, areas, etc.) - Reliability of the water supply system (number of hour of supply per day) - Accessibility in terms of walking distance, waiting time or possible barriers (e.g. during the rainy season)
Service efficiency
The service efficiency criteria referred to the costs of delivering water to the targeted population
Service provider
Information about the water provider in the case study. As the study focus on community managed water supply, in most cases, the service provider was the community itself, however other actors can also be involved (e.g. Government, local NGO, private supplier, etc.)

SUSTAINABILITY
Sustainability criteria were highly important to consider during the scoring phase. This category includes information about different sustainability dimensions of the service
Technical sustainability
Referred to the performance of the technology put in place and its management system (e.g. evolution of the service level, spare parts procurement system, O&M management, etc.)
Financial sustainability
Referred to the financial management of the system, like, for example, cost recovery or tariffs collection system
Institutional sustainability
Linked to the community performance in managing the system (e.g. capacity building, community autonomy)
Scalability
Extension of the system in nearby areas or elsewhere

COMMUNITY PROFILE
This section of the success framework was dedicated to data about the community managing the water supply system
Demographic profile
<ul style="list-style-type: none"> - Population: number of people living in the community - Structure: of the community (e.g. village, locality, chain-linked villages, etc.)
Economic profile
<ul style="list-style-type: none"> - Average household income - Main source of income: the main activity on which household base their income (i.e. agriculture, craftsmanship, mining, small business, etc.)
Capacity
<ul style="list-style-type: none"> - Education level: literacy rate within the community/ Presence of a school - Technical skills: regarding the community's ability to maintain their water system
Access
<ul style="list-style-type: none"> - To technology: ease with which the community can access technology (i.e. machines, spare parts, etc.) - To financial resources: community access to banking services

COMMUNITY ROLE
Community role during and after the implementation of the water supply system played an important part for the analysis of the case studies
Involvement
<ul style="list-style-type: none"> - Level of involvement during the implementation phase - Mode of involvement of the community (e.g. Water committee, subcontractor) - Responsibilities of the community in relation to the water system (e.g. water distribution, minor maintenance, full responsibilities of the system, etc.)
Contribution
<ul style="list-style-type: none"> - Type of the contribution of the community during the implementation of the water supply system (e.g. labour, time, financial, etc.) - Level of the contribution of the community during the implementation of the water supply system (i.e. % of the costs that is being provided by the community)
Transparency
Information about the mechanisms within the community to ensure transparency and accountability

EXTERNAL 'PLUS'
This category included information about the external resources, called the "plus", provided to the community to ensure the service procurement and sustainability
Support
<ul style="list-style-type: none"> - Type of support provided to the community (e.g. direct, capacity building, etc.) - Entities involved in this support (i.e. NGO, government, private sector) - Functions of the entities in the support (e.g. in charge of operation and maintenance, helping the community during breaks or expansion, construction of the system, etc.)
Enabling environment
<ul style="list-style-type: none"> - Institutional mechanisms enabling support of the community - Existing policies favouring the support and/or management of water system at the community level

In the following pages, the results of using the Success Spreadsheet to analyse the 130 case studies are illustrated, although not all the categories are included. To full analysis can be found in the Mendeley database.

No.	Title	Risks/Issues		SUSTAINABILITY			COMMUNITY ENGAGEMENT			BUDGET/RESOURCES		
		Financial	Technical/Operational	Human Resources	Environmental	Social	Cost	Time	Responsibility	Type	Impact/Status	Notes
1	Financial Risk: Budget Overruns	Exceeding allocated budget	Complex project with multiple stakeholders and dependencies	Human Resources: Staffing gaps, turnover, skill shortages	Environmental: Regulatory changes, resource availability	Social: Community engagement, stakeholder expectations	High	Medium	Project Manager	Strategic	High Impact	Regular monitoring and reporting required
2	Operational Risk: System Downtime	System outages	Essential services provided via digital channels	Human Resources: Limited IT expertise	Environmental: Data security, privacy concerns	Social: User experience, accessibility	Medium	High	IT Director	Operational	Medium Impact	Proactive maintenance and disaster recovery plans
3	Compliance Risk: Regulatory Changes	Non-compliance with laws	Complex regulatory environment	Human Resources: Lack of legal expertise	Environmental: Data privacy, security	Social: Transparency, accountability	Medium	Medium	Legal Counsel	Strategic	Medium Impact	Regular legal reviews and updates
4	Reputational Risk: Negative Publicity	Media coverage, social media	Public perception of services	Human Resources: Staff morale, training	Environmental: Environmental impact, sustainability	Social: Community relations, trust	Medium	High	Public Affairs	Strategic	High Impact	Proactive communication and crisis management
5	Strategic Risk: Market Saturation	Increased competition	Service quality, innovation	Human Resources: Talent acquisition, retention	Environmental: Resource efficiency, waste management	Social: Customer satisfaction, loyalty	Medium	Medium	Marketing	Strategic	Medium Impact	Differentiation through value-added services
6	Financial Risk: Funding Shortfalls	Revenue decline	Essential services provided	Human Resources: Staffing levels, productivity	Environmental: Infrastructure costs, maintenance	Social: Community support, engagement	High	Medium	Finance	Strategic	High Impact	Diversification of revenue streams
7	Operational Risk: Service Quality	Customer complaints	Service reliability, responsiveness	Human Resources: Staff training, motivation	Environmental: Resource allocation, efficiency	Social: Customer satisfaction, loyalty	Medium	High	Operations	Operational	Medium Impact	Continuous improvement and feedback loops
8	Strategic Risk: Innovation Stagnation	Lack of new products	Service quality, innovation	Human Resources: Staff training, motivation	Environmental: Resource allocation, efficiency	Social: Customer satisfaction, loyalty	Medium	Medium	R&D	Strategic	Medium Impact	Investment in research and development

No.	Title	PARTS/SECTION/TITLE	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE GOVERNANCE					
			Future viability	Present viability	Viability/Resilience	Equity	Lead	Share	Responsibility	Type	Other related	Impact			
1	Environmental Impact Study	Environmental Impact Study Report	The various sustainable building	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2	Corporate Environmental Policy or Framework or Statement of Intent, Vision	Corporate Environmental Policy	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
3	Energy Management System	Energy Management System	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
4	Water Management System	Water Management System	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
5	Waste Management System	Waste Management System	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
6	Community Engagement Policy	Community Engagement Policy	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
7	Anti-Corruption Policy	Anti-Corruption Policy	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

ID	Title	SUSTAINABILITY					COMMUNITY ROLE			CORPORATE GOVERNANCE		
		Training					Lead	Risk	Responsibility	Type	Governing Body	Status
		Technical	Business	Financial	Operational	Health						
1	Environmental Management System (EMS) Implementation	2018-2020	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation	Environmental Management System (EMS) Implementation
2	Energy Efficiency Improvement	2018-2020	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement	Energy Efficiency Improvement
3	Waste Management	2018-2020	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management	Waste Management
4	Water Conservation	2018-2020	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation	Water Conservation
5	Carbon Footprint Reduction	2018-2020	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction	Carbon Footprint Reduction

No.	Title	PARTS LISTED Training	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE VALUE		
			Technical sustainability	Thematic sustainability	Leadership sustainability	Viability	Lead	Share	Responsibility	Engage	Empower	Enable
1	Supply Chain Management	Supply chain management training for all employees	Responsible for management of supply chain	Supply chain management	Supply chain management	Supply chain management	Supply chain management	Supply chain management	Supply chain management	Supply chain management	Supply chain management	Supply chain management
2	Human Resources	Human resources training for all employees	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management	Human resources management
3	Finance	Finance training for all employees	Finance management	Finance management	Finance management	Finance management	Finance management	Finance management	Finance management	Finance management	Finance management	Finance management
4	Marketing	Marketing training for all employees	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management	Marketing management
5	Operations	Operations training for all employees	Operations management	Operations management	Operations management	Operations management	Operations management	Operations management	Operations management	Operations management	Operations management	Operations management
6	Information Technology	Information Technology training for all employees	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management	Information Technology management
7	Legal	Legal training for all employees	Legal management	Legal management	Legal management	Legal management	Legal management	Legal management	Legal management	Legal management	Legal management	Legal management
8	Health and Safety	Health and Safety training for all employees	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management	Health and Safety management

ID	Title	PARTS CENTER Training	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE RESPONSIBILITY			
		Objective	Technical sustainability	Financial sustainability	Environmental sustainability	Socially	Local	State	National	Type	Other Project	Impact	
1	Partnership with local government	Partnership with local government	No	In 2018, to address the economic challenges faced by the 10,000 residents and the impact of the pandemic, we have	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
2	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
3	Partnership with local government	Partnership with local government	No	The 2018 will focus on the 10,000 residents and the impact of the pandemic, we have	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
4	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
5	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
6	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
7	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government
8	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	No	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government	Partnership with local government

No.	Name	PARTS CENTER Training	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE VALUE			
		Structure	Business model	Market viability	Customer viability	Financial viability	Feasibility	Low	Mid	High	Type	Impact/ Benefit	Impact
1	Assembly Program	10 years for each assembly station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program. One person could be trained and the shop is able to do the work in-house if needed.	100% (based on cost of materials)	100% (based on customer demand)	100% (based on revenue)	+	Low	Mid	High	Low	High	Partnership with local manufacturers
2	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
3	Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
4	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
5	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
6	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
7	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
8	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
9	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers
10	Local Manufacturing Program	1 year for each manufacturing station	Partnership with local manufacturers to provide training, then subcontracted to the POC for completion of the program.	100%	100%	100%	+	Low	Mid	High	Low	High	Partnership with local manufacturers

ID	Title	PARTICIPATION	SUSTAINABILITY				COMMUNITY ENGAGEMENT			BUDGETARY		
		Activities	Future viability	Financial viability	Technical viability	Viability	Low	Mid	High	Type	Other project	Notes
1	Project 1: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
2	Project 2: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
3	Project 3: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
4	Project 4: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
5	Project 5: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
6	Project 6: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
7	Project 7: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
8	Project 8: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
9	Project 9: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]
10	Project 10: [Title]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]	[Description]

No.	Title	BETTER QUALITY					COMMUNITY FIRST			BETTER VALUE		
		Structure	Process	People	Performance	Flexibility	Cost	Risk	Responsibility	Type	Effective Period	Location
1	Project Management System	Standardized project management system	Clear roles and responsibilities, regular communication, transparent decision-making	Empowering project teams, providing training and support	Improved project delivery, reduced risk, increased stakeholder satisfaction	High	Low	Shared	2015-2018	Citywide	Citywide	
2	Customer Service Improvement	Streamlined service processes, digital channels	Empowering staff, providing training and support	Regular customer feedback, proactive communication	Improved customer satisfaction, reduced complaints, increased loyalty	High	Low	Shared	2015-2018	Citywide	Citywide	
3	Financial Management System	Automated financial reporting, budgeting tools	Regular communication, transparency	Empowering staff, providing training and support	Improved financial performance, reduced risk, increased transparency	High	Low	Shared	2015-2018	Citywide	Citywide	
4	Human Resources Management System	Streamlined recruitment, performance management	Regular communication, transparency	Empowering staff, providing training and support	Improved human resources management, reduced risk, increased transparency	High	Low	Shared	2015-2018	Citywide	Citywide	
5	Information Technology System	Cloud-based IT services, cybersecurity measures	Regular communication, transparency	Empowering staff, providing training and support	Improved IT services, reduced risk, increased transparency	High	Low	Shared	2015-2018	Citywide	Citywide	

No.	Item	PARTS LISTING	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE RESPONSIBILITY		
		Material	Technical sustainability	Process sustainability	Product sustainability	Socially	Low	Mid	High	Type	Other product	Material
1	Working together to create a better world for all (Sustainability)	Technical sustainability	<p>The company is committed to creating a better world for all. This commitment is reflected in our sustainability strategy, which focuses on three key areas: environmental, social, and governance. Our environmental strategy is focused on reducing our carbon footprint, conserving resources, and managing waste. Our social strategy is focused on promoting diversity and inclusion, supporting our employees, and contributing to the communities we operate in. Our governance strategy is focused on ensuring transparency, integrity, and ethical behavior. We believe that these three pillars are essential for creating a better world for all.</p>	<p>Our commitment to sustainability is reflected in our technical specifications, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our product design, which is focused on creating products that are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our social and governance practices, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	Low	Mid	High	Technical sustainability	Product sustainability	Socially
2	Working together to create a better world for all (Sustainability)	Technical sustainability	<p>Our commitment to sustainability is reflected in our technical specifications, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our product design, which is focused on creating products that are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our social and governance practices, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	Low	Mid	High	Technical sustainability	Product sustainability	Socially	
3	Working together to create a better world for all (Sustainability)	Technical sustainability	<p>Our commitment to sustainability is reflected in our technical specifications, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our product design, which is focused on creating products that are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our social and governance practices, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	Low	Mid	High	Technical sustainability	Product sustainability	Socially	
4	Working together to create a better world for all (Sustainability)	Technical sustainability	<p>Our commitment to sustainability is reflected in our technical specifications, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our product design, which is focused on creating products that are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	<p>Our commitment to sustainability is reflected in our social and governance practices, which are designed to ensure that our products are safe, reliable, and environmentally friendly. We use high-quality materials and advanced manufacturing processes to ensure that our products meet the highest standards of performance and durability. We also invest in research and development to create new and innovative products that address the needs of our customers and the environment.</p>	Low	Mid	High	Technical sustainability	Product sustainability	Socially	

No.	Title	PARTS (OPTIONAL)	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE VALUE		
		Structure	Technical sustainability	Financial sustainability	Environmental sustainability	Socially	Lead	Share	Support/enable	Engage	Enable/enable	Enable
10	Business Development	Develop the strategy for the company's growth, including identifying new markets and products.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	Marketing	Develop and execute marketing campaigns to promote the company's products and services.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	Human Resources	Recruit, develop, and retain a high-quality workforce.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	Operations	Manage the day-to-day operations of the company, including production, distribution, and customer service.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	Finance	Manage the company's financial resources, including budgeting, accounting, and capital management.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Legal	Ensure the company complies with all applicable laws and regulations.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	IT	Manage the company's information technology systems, including hardware, software, and data management.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	Customer Service	Provide high-quality customer service to ensure customer satisfaction and loyalty.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	Supply Chain Management	Manage the company's supply chain, including procurement, production, and distribution.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	Research and Development	Invest in research and development to create new products and services.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	Corporate Governance	Ensure the company is governed in a transparent and ethical manner.	Identify and develop new products and services that meet the needs of the market and are profitable.	Ensure the company has sufficient financial resources to fund its growth strategy.	Identify and develop new products and services that meet the needs of the market and are profitable.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

No	Item	PARTICULARS	SUSTAINABILITY				COMMUNITY ROLE			CORPORATE GOVERNANCE		
		Financial Sustainability	Human Sustainability	Customer Sustainability	Environmental Sustainability	Low	High	Appropriate	Type	Other related	Details	
18	Financial reports and financial statements	Financial reports and financial statements	To enhance transparency	Yes	Highly sustainable	Yes	Yes	Highly appropriate	Internal Report Integrated Sustainability/ESG Report	Internal Report	Yes - Sustainability & Governance	It enhances transparency & trust in the ESG/Sustainability practices
19	Annual report and other reports	All reports published on the website	Yes	Yes	Yes	Yes	Medium - Low	Highly appropriate	Annual Report, Sustainability Report, ESG Report	Internal Report	Yes - Sustainability & Governance	Provides information about activities & progress
20	Employee Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Employee Report	Internal Report	Yes - Sustainability & Governance	It empowers the employees
21	Customer satisfaction	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Customer Satisfaction Survey	Internal Report	Yes - Sustainability & Governance	It empowers the customers
22	Community Development	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Community Development Program	Internal Report	Yes - Sustainability & Governance	It empowers the community
23	Supplier Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Supplier Report	Internal Report	Yes - Sustainability & Governance	It empowers the suppliers
24	Shareholder Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Shareholder Report	Internal Report	Yes - Sustainability & Governance	It empowers the shareholders
25	Annual Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Annual Report	Internal Report	Yes - Sustainability & Governance	It empowers the stakeholders
26	ESG Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	ESG Report	Internal Report	Yes - Sustainability & Governance	It empowers the stakeholders
27	Human Resource Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Human Resource Report	Internal Report	Yes - Sustainability & Governance	It empowers the employees
28	Customer Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Customer Report	Internal Report	Yes - Sustainability & Governance	It empowers the customers
29	Supplier Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Supplier Report	Internal Report	Yes - Sustainability & Governance	It empowers the suppliers
30	Shareholder Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Shareholder Report	Internal Report	Yes - Sustainability & Governance	It empowers the shareholders
31	Annual Report	Yes	Yes	Yes	Yes	Yes	High	Highly appropriate	Annual Report	Internal Report	Yes - Sustainability & Governance	It empowers the stakeholders

ID	Title	RISK SOURCE	VULNERABILITY				COMMUNITY RISK			BOPALU RISK		
		Frequency	Future vulnerability	Present vulnerability	Existing vulnerability	Exposure	Loss	Disturbance	Responsibility	Type	Control period	Control
1
2
3
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No.	Title	NACTS Section	SUSTAINABILITY				COMMUNITY ENGAGEMENT			CORPORATE GOVERNANCE		
			Future viability	Human viability	Ecological viability	Socially	Low	High	Appropriate	Type	Other points	Notes
1	Development of a new residential area	Development of a new residential area	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	High	Low	Appropriate	Development of a new residential area	Development of a new residential area	Development of a new residential area	
2	Development of a new residential area	Development of a new residential area	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	High	Low	Appropriate	Development of a new residential area	Development of a new residential area	Development of a new residential area	
3	Development of a new residential area	Development of a new residential area	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	High	Low	Appropriate	Development of a new residential area	Development of a new residential area	Development of a new residential area	
4	Development of a new residential area	Development of a new residential area	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	The development of a new residential area is considered to be a positive contribution to the local economy and to the well-being of the community. It is also considered to be a positive contribution to the local environment.	High	Low	Appropriate	Development of a new residential area	Development of a new residential area	Development of a new residential area	

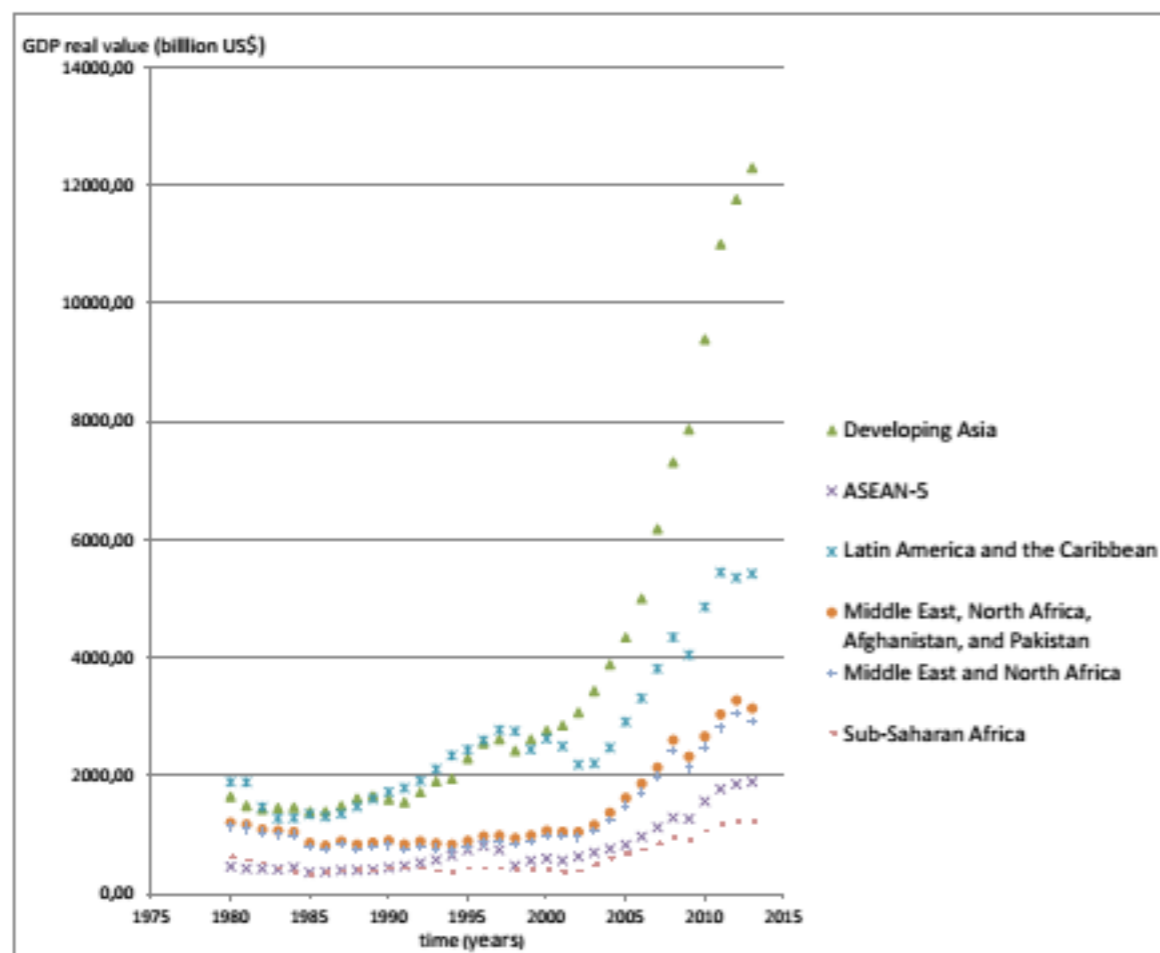
APPENDIX B - SOCIO-ECONOMIC SPREADSHEET

1- GDP data																																		
In US dollar current (=nominal) values (billion US\$)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Developing Asia	734,51	727,61	739,96	783,31	815,70	799,47	816,94	896,43	1005,42	1071,55	1072,30	1076,04	1219,41	1382,39	1446,37	1734,70	1985,17	2047,10	1919,02	2097,85	2267,75	2392,60	2618,59	2986,86	3465,92	3999,85	4745,90	6019,67	7259,59	7870,57	9511,95	11359,36	12358,48	13093,02
ASEAN-5	207,03	209,65	221,94	224,29	250,61	210,64	221,80	240,57	249,90	264,86	298,23	330,62	375,46	420,12	482,98	561,90	626,65	584,94	378,92	453,48	493,73	477,55	539,84	611,16	684,01	786,39	922,80	1099,65	1286,36	1274,92	1588,41	1839,55	1954,98	2023,03
Latin America and the Caribbean	844,18	920,71	761,17	688,29	716,38	774,79	786,95	816,01	919,51	1042,03	1159,13	1241,49	1358,42	1530,46	1734,16	1844,69	2001,77	2171,79	2178,76	1963,00	2158,42	2099,99	1869,20	1919,35	2211,72	2686,07	3146,33	3717,70	4317,44	4052,70	4924,15	5625,21	5828,99	5774,08
Middle East, North Africa, Afghanistan, and Pakista	537,92	572,58	564,08	575,57	583,53	495,33	478,85	537,76	521,74	562,21	604,29	581,91	630,73	621,03	620,72	680,97	754,06	774,50	746,92	797,28	877,70	882,78	894,42	1016,08	1290,56	1487,51	1774,12	2087,18	2589,86	2328,54	2702,89	3142,21	3447,38	3350,22
Middle East and North Africa	507,06	539,34	530,35	540,71	547,14	457,68	439,58	495,75	476,21	514,93	551,94	522,25	566,87	553,42	552,20	601,50	670,61	692,05	665,03	719,07	797,85	804,23	812,13	921,67	1119,57	1372,64	1629,80	1925,97	2406,20	2146,31	2509,33	2910,56	3201,53	3093,06
Sub-Saharan Africa	279,15	276,00	273,25	236,11	204,39	189,20	207,06	232,01	252,11	254,11	292,10	297,06	304,56	283,57	268,89	321,34	336,59	335,75	317,12	319,19	331,21	317,72	336,73	431,11	538,43	629,20	718,89	829,60	945,27	896,92	1076,58	1226,01	1272,02	1315,42

In 2009 US dollar real (=constant) values (billion US\$)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Developing Asia	1653,37	1498,01	1434,41	1460,80	1469,07	1395,19	1367,59	1495,31	1620,40	1682,35	1604,16	1557,92	1726,13	1911,36	1958,12	2300,48	2559,41	2621,25	2430,86	2619,69	2769,23	2856,29	3078,73	3442,91	3888,52	4348,09	5005,28	6184,48	7315,48	7870,57	9396,13	11907,35	11789,74	12300,61
ASEAN-5	468,02	431,63	430,24	418,28	451,34	367,59	379,42	401,30	402,76	410,88	446,14	478,68	531,48	580,87	653,84	745,17	816,15	748,99	479,99	566,34	602,92	570,10	634,70	704,47	787,42	833,11	973,24	1129,76	1296,26	1274,92	1589,40	1782,54	1861,85	1900,59
Latin America and the Caribbean	1909,23	1895,55	1475,54	1283,59	1290,20	1352,11	1311,99	1361,18	1481,94	1616,56	1734,06	1797,66	1922,91	2116,09	2347,75	2446,35	2607,09	2780,93	2759,88	2451,58	2635,73	2506,97	2197,67	2212,41	2481,40	2919,92	3318,28	3819,49	4350,68	4052,70	4865,23	5450,69	5360,84	5424,62
Middle East, North Africa, Afghanistan, and Pakista	1210,85	1178,82	1093,48	1073,38	1050,92	864,43	819,14	897,03	840,87	872,18	904,02	842,50	892,83	858,66	840,35	903,08	982,08	991,73	946,14	995,72	1071,79	1053,86	1051,59	1171,20	1380,60	1627,89	1871,08	2144,32	2609,80	2328,54	2670,55	3044,84	3283,16	3147,46
Middle East and North Africa	1141,39	1110,39	1028,08	1008,38	985,39	798,71	751,97	826,95	787,49	798,83	825,70	756,13	802,43	765,18	747,57	797,68	873,40	886,15	842,41	898,04	974,28	960,09	954,85	1062,40	1256,08	1482,15	1718,67	1978,70	2426,74	2146,31	2479,30	2820,36	3049,02	2995,86
Sub-Saharan Africa	628,35	568,22	529,70	440,31	368,10	330,18	354,21	387,01	406,31	394,22	436,99	430,09	431,12	392,08	364,03	426,15	438,37	429,91	401,70	398,64	404,46	379,30	395,90	496,93	604,08	683,98	758,18	852,31	952,54	896,92	1063,69	1188,02	1211,42	1235,81

GDP deflator	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	44,425	48,572	51,586	53,622	55,525	57,302	58,457	59,949	62,048	64,46	66,845	69,069	70,644	72,325	73,865	75,406	76,782	78,096	78,944	80,071	81,891	83,796	85,054	86,754	89,132	91,991	94,818	97,335	98,236	100	101,211	103,198	105,002	106,442
GDP deflator / 100	0,44425	0,48572	0,51586	0,53622	0,55525	0,57302	0,58457	0,59949	0,62048	0,6446	0,66845	0,69069	0,70644	0,72325	0,73865	0,75406	0,76782	0,78096	0,78944	0,80071	0,81891	0,83796	0,85054	0,86754	0,89132	0,91991	0,94818	0,97335	0,99236	1	1,01211	1,03198	1,05002	1,06442

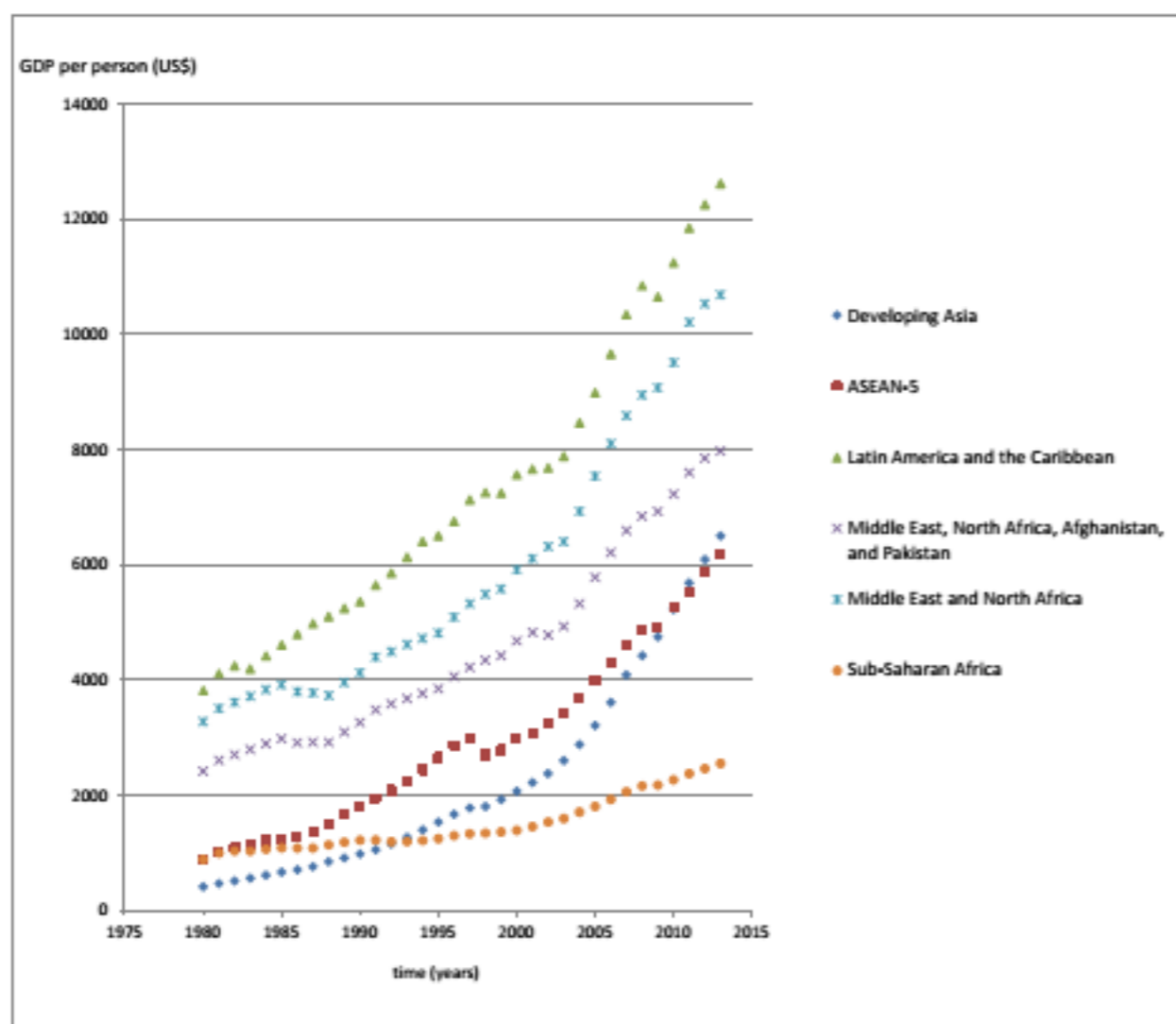
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2- GDP per person based on PPP data

GDP based on PPP per capita GDP (USD)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Developing Asia	412,738	498,586	513,849	562,854	614,784	667,27	707,537	762,138	847,445	914,955	983,065	1055,03	1158,09	1272,87	1401,18	1537,17	1673,34	1783,65	1898,18	1927,29	2072,92	2222,84	2378,73	2694,54	2884,42	3213,99	3615,24	4091,36	4428,51	4755,53	5230,57	5691,16	6099,38	6507,19
ASEAN-5	881,744	9000,42	1081,73	1150,59	1210,3	1231	1285,78	1364,42	1494,81	1654,28	1807,55	1950,03	2083,73	2253,19	2436,21	2653,89	2861,54	2978,21	2697,94	2783,99	2969,13	3075,42	3228,88	3420,88	3702,3	3991,95	4286,3	4607,8	4852,12	4914,37	5250,38	5521,98	5887,93	6183,07
Latin America and the Caribbean	3823,93	4116,38	4251,2	4197,87	4421,87	4615,83	4799,83	4984,34	5108,11	5250,52	5367,76	5651,14	5860,45	6135,01	6412,82	6512,54	6780,55	7135,71	7289,15	7252,5	7570,01	7667,84	7691,92	7892,66	8474,46	8996,58	9698,4	10352	10854,8	10961,9	11255	11857,4	12285,1	12629
Middle East, North Africa, Afghanistan, and Pak	2420,58	2609,22	2706,42	2799,02	2898,28	2983,59	2915,26	2924,15	2923,43	3100,58	3268,59	3486,18	3590,12	3679,84	3768,61	3853,43	4066,01	4226,16	4350,02	4428,68	4685,45	4831,18	4783,99	4937,46	5329,88	5787,8	6218,07	6601,66	6850,98	6931,9	7234,08	7608,78	7859,66	7982,79
Middle East and North Africa	3080,42	3510,94	3618,64	3722,63	3839,71	3925,36	3800,63	3783,6	3738,84	3963,03	4132,56	4404,16	4498,54	4623	4726,79	4821,22	5096,55	5331,43	5496,68	5587,54	5921,4	6114,47	6304,86	6498,89	6936,36	7547,15	8111,57	8594,05	8957,92	9082,85	9519,67	10220,2	10543,2	10697,1
Sub-Saharan Africa	885,796	999,755	1033,86	1030,55	1005,44	1088,36	1084,59	1084,76	1139,97	1186,34	1221,47	1223,69	1194,91	1198,21	1216,22	1247,80	1301,54	1334,58	1345,38	1365,79	1393,18	1457,28	1536,99	1598,68	1710,94	1807,84	1929,46	2062,57	2164,7	2179,7	2270,8	2378,18	2484,95	2584,71

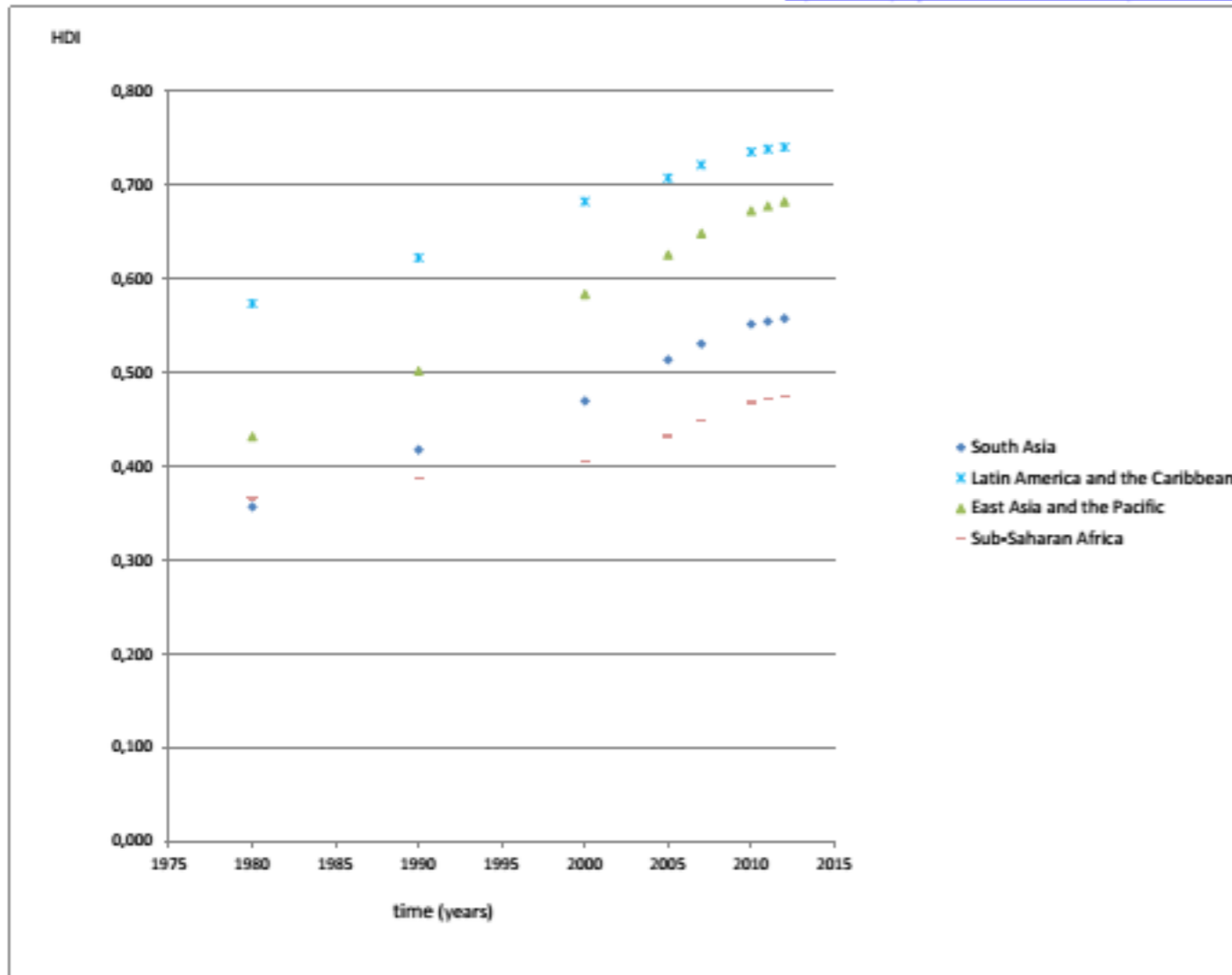
<http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/index.aspx>



3- HDI data

HDI index	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
South Asia	0,357										0,418										0,470					0,514		0,531			0,552	0,555	0,558	
Latin America and the Caribbean	0,574										0,623										0,683					0,708		0,722			0,736	0,739	0,741	
East Asia and the Pacific	0,432										0,502										0,584					0,626		0,649			0,673	0,678	0,683	
Sub-Saharan Africa	0,366										0,387										0,405					0,432		0,446			0,468	0,472	0,475	

<http://data.un.org/dataset/Table-2-Human-Development-Index-trends/cfc4-riv>



4- List of the regions

Emerging market and developing economies

Composed of 154 countries: Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Azerbaijan, The Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Democratic Republic of the Congo, Republic of Congo, Costa Rica, Côte d'Ivoire, Croatia, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Gabon, The Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kosovo, Kuwait, Kyrgyz Republic, Lao P.D.R., Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, FYR Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Rwanda, Samoa, São Tomé and Príncipe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Solomon Islands, South Africa, South Sudan, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Syria, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe.

Central and eastern Europe

Composed of 14 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, Latvia, Lithuania, FYR Macedonia, Montenegro, Poland, Romania, Serbia, and Turkey.

Commonwealth of Independent States

Composed of 12 countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Georgia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Developing Asia

Composed of 29 countries: Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, and Vietnam.

ASEAN-5

Composed of 5 countries: Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Latin America and the Caribbean

Composed of 32 countries: Antigua and Barbuda, Argentina, The Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

Middle East, North Africa, Afghanistan, and Pakistan

Composed of 22 countries: Afghanistan, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

Middle East and North Africa

Composed of 20 countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

Sub-Saharan Africa

Composed of 45 countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, South Africa, South Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.

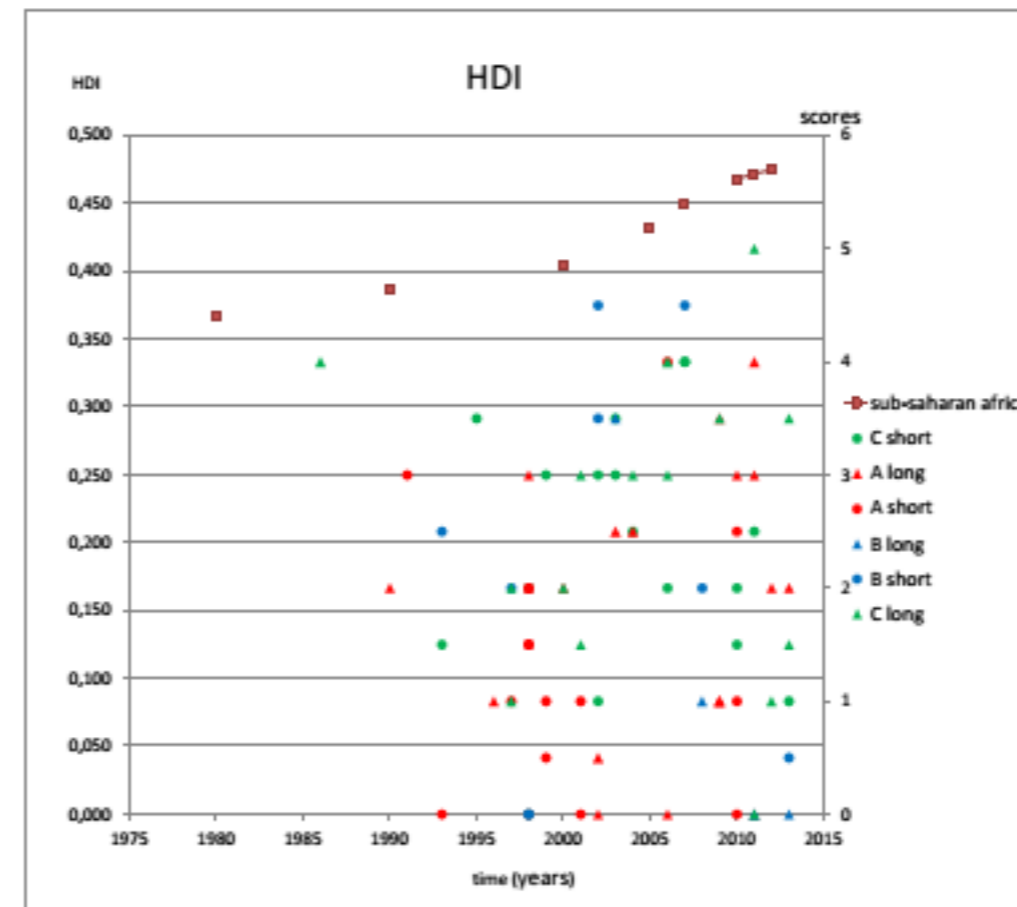
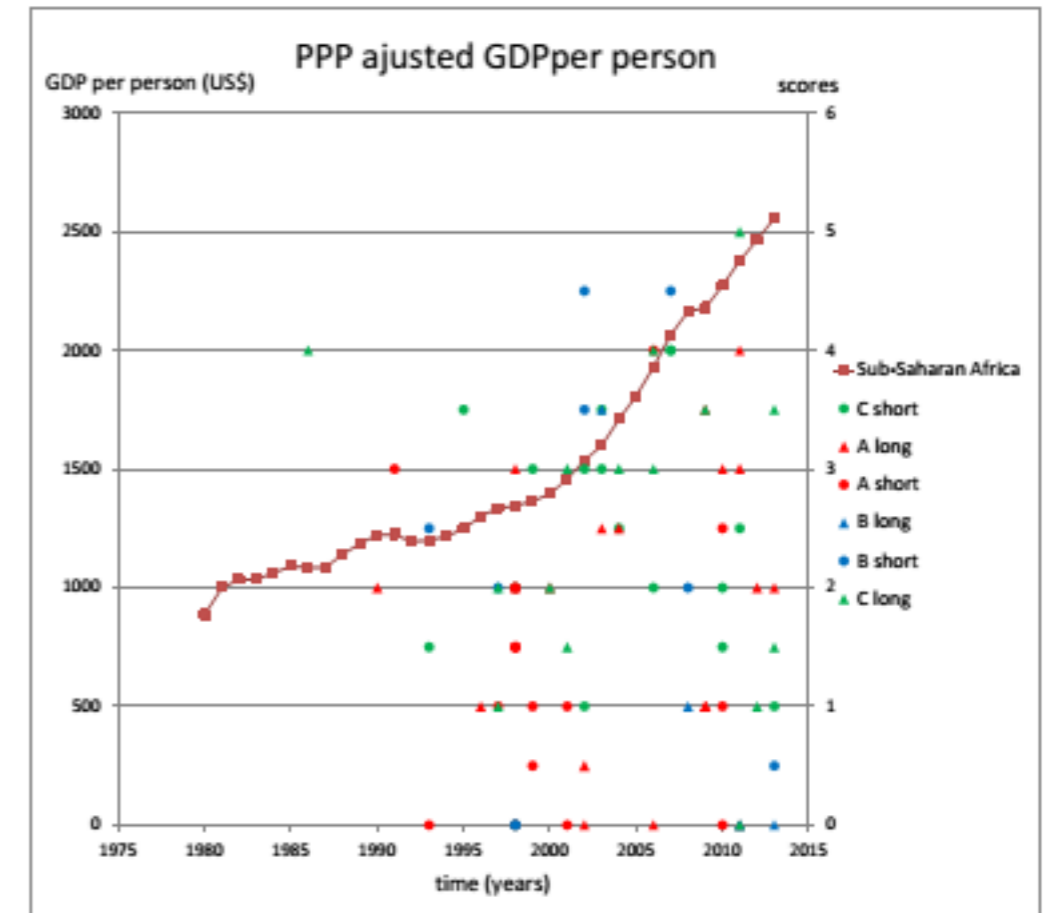
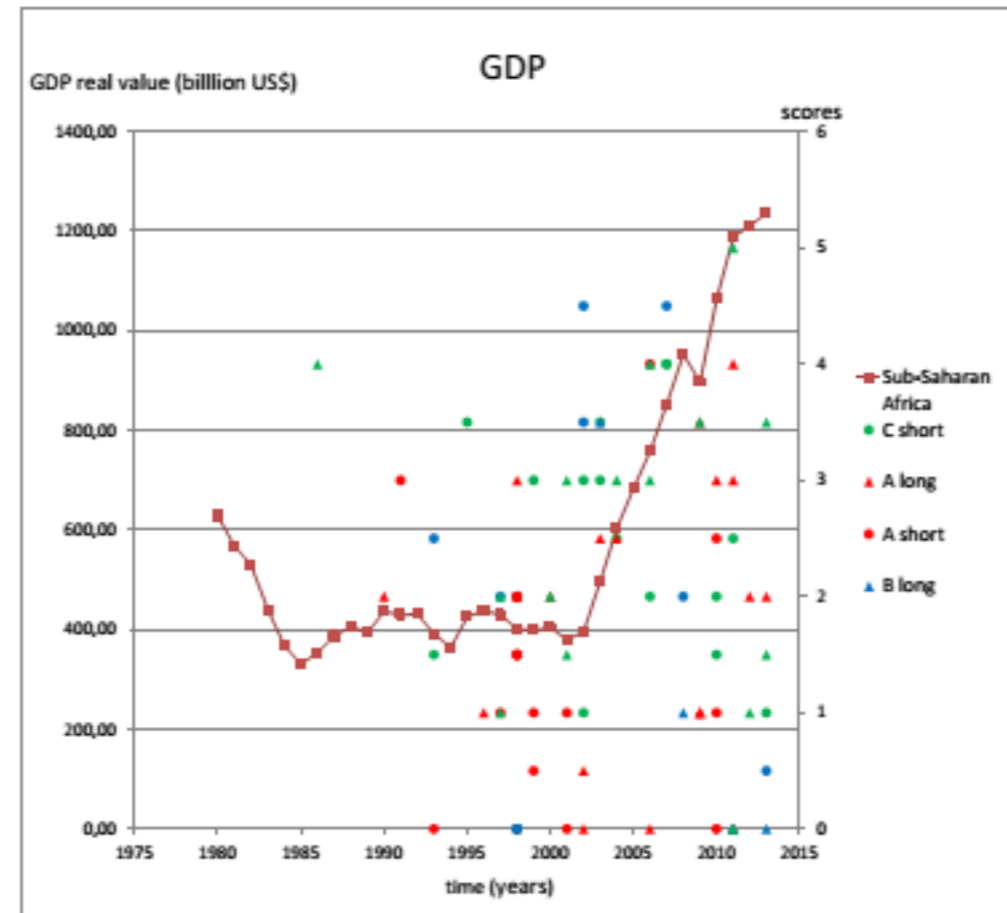
5- Sub-Saharan Africa graphs

Categories A, B and C refer to the number of years between completion of the projects and the writing of the case studies:

- A: less than 3 years from completion,
- B: between 3 and 5 years from completion,
- C: more than 5 years from completion. Long and short

refer to the length of the case studies, as it is classified in the *Mendeley* database:

- short: less than 4 pages,
- long: more than 4 pages.



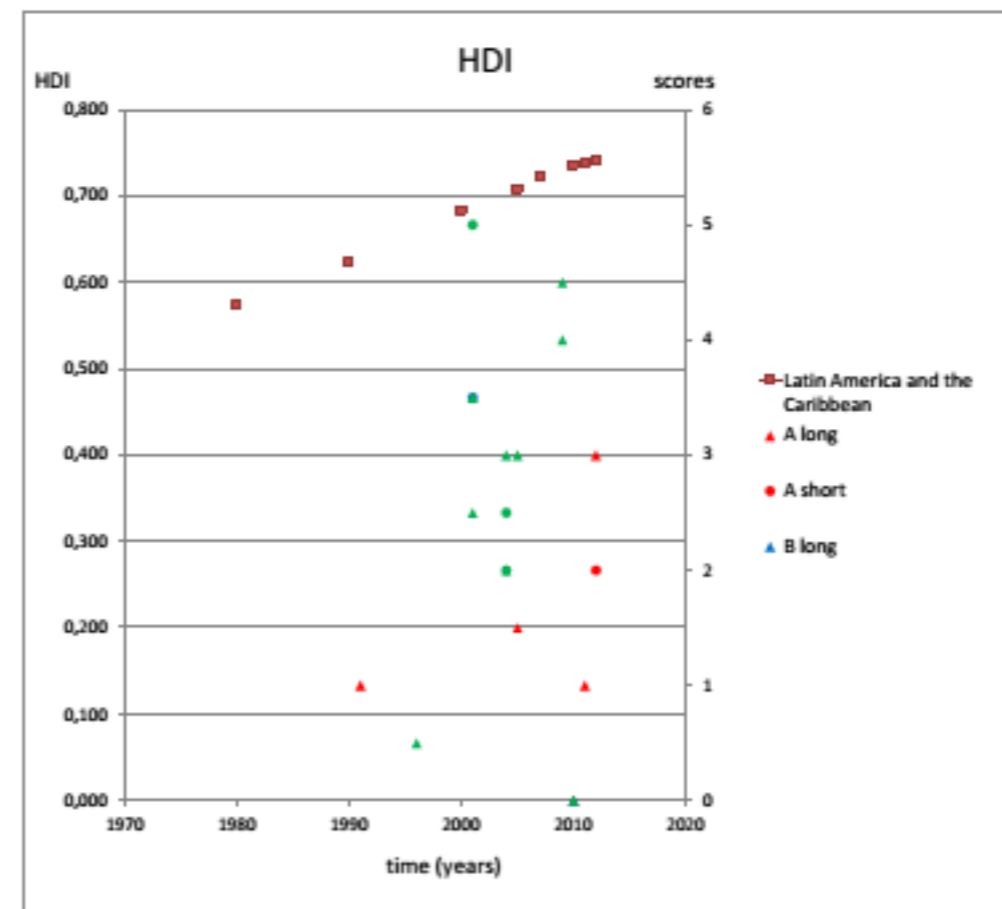
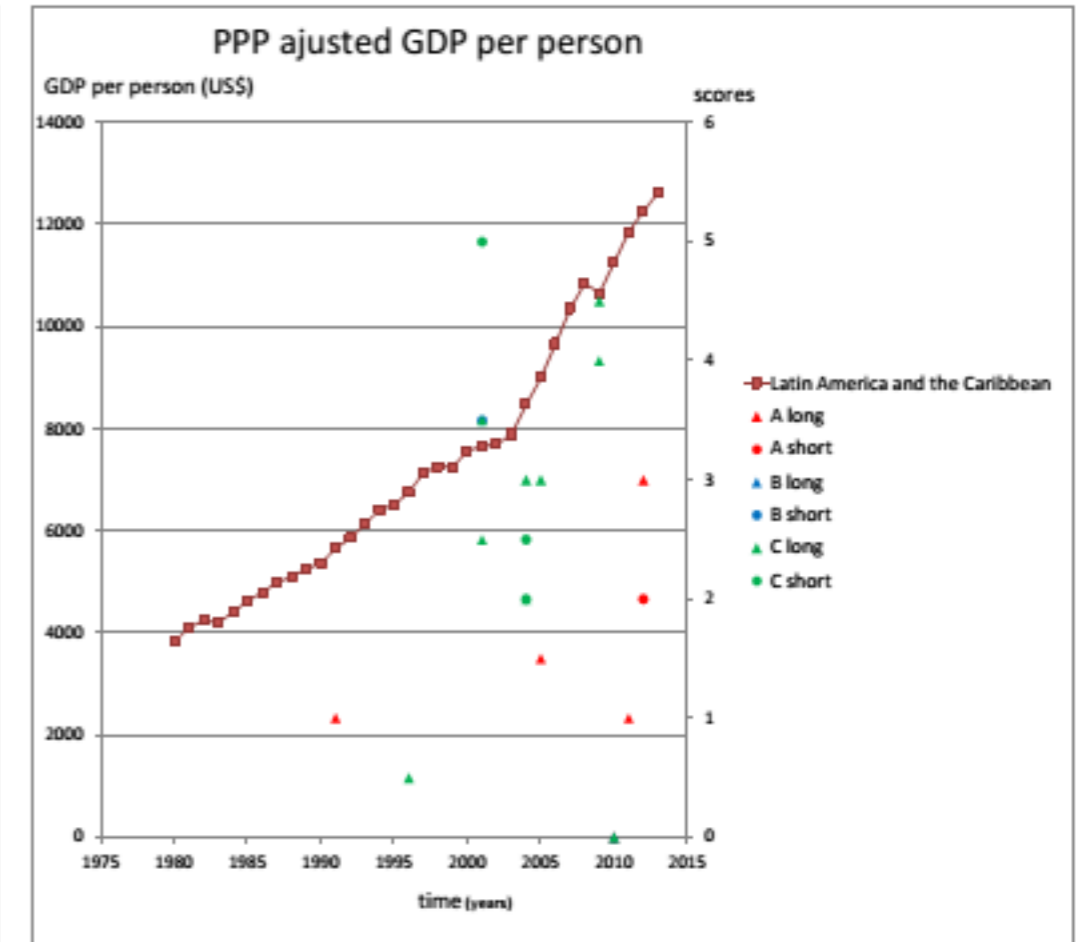
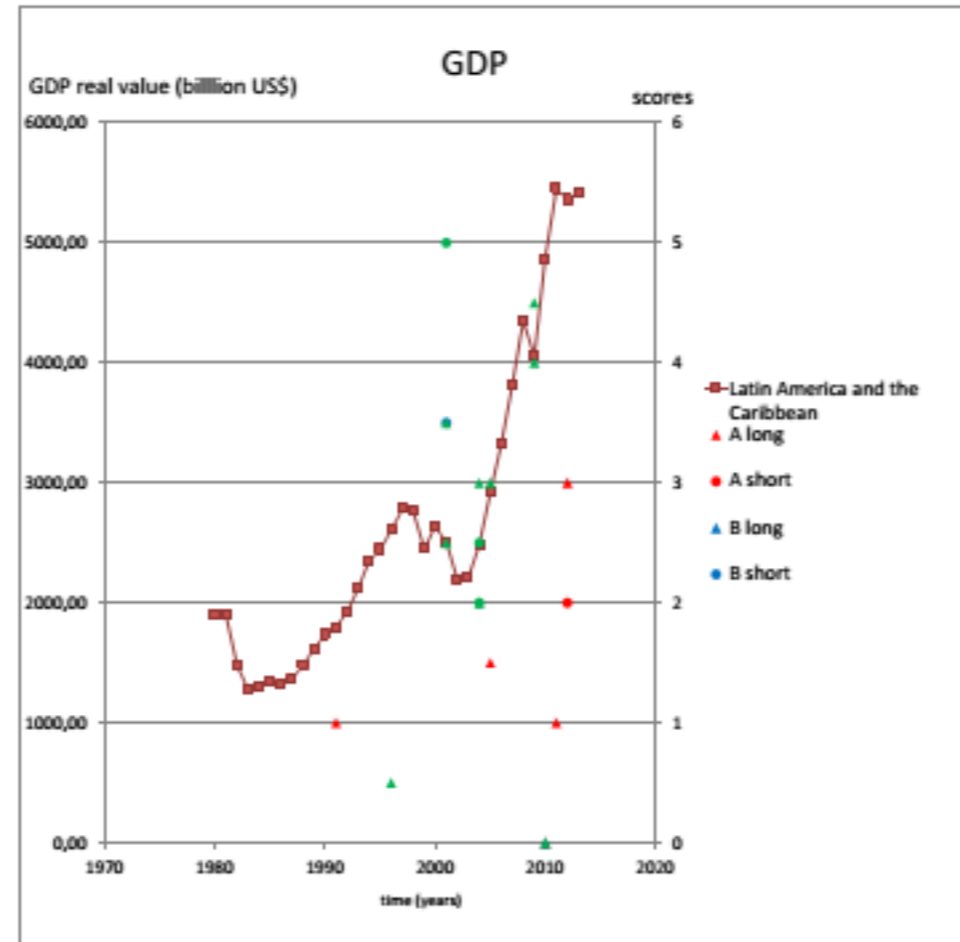
6- Latin America and the Caribbean graphs

Categories A, B and C refer to the number of years between completion of the projects and the writing of the case studies:

- A: less than 3 years from completion,
- B: between 3 and 5 years from completion,
- C: more than 5 years from completion.

Long and short refer to the length of the case studies, as it is classified in the *Mendeley* database:

- short: less than 4 pages,
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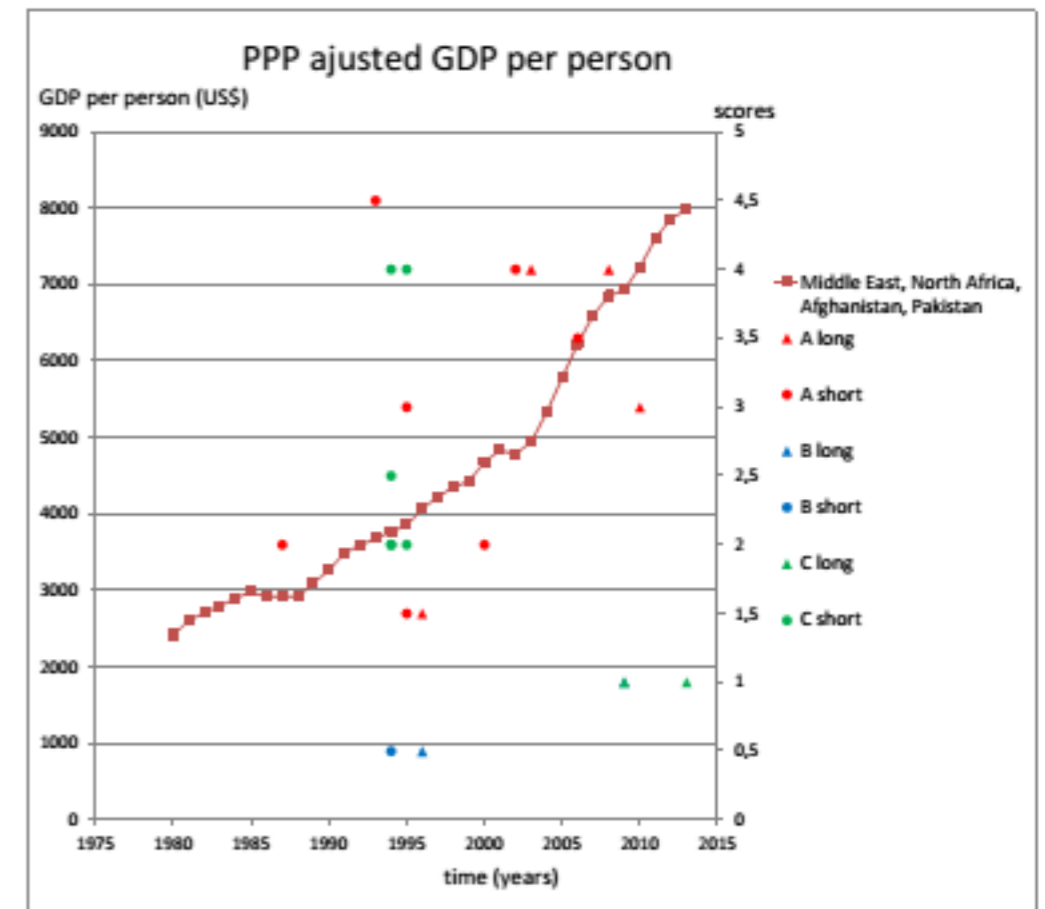
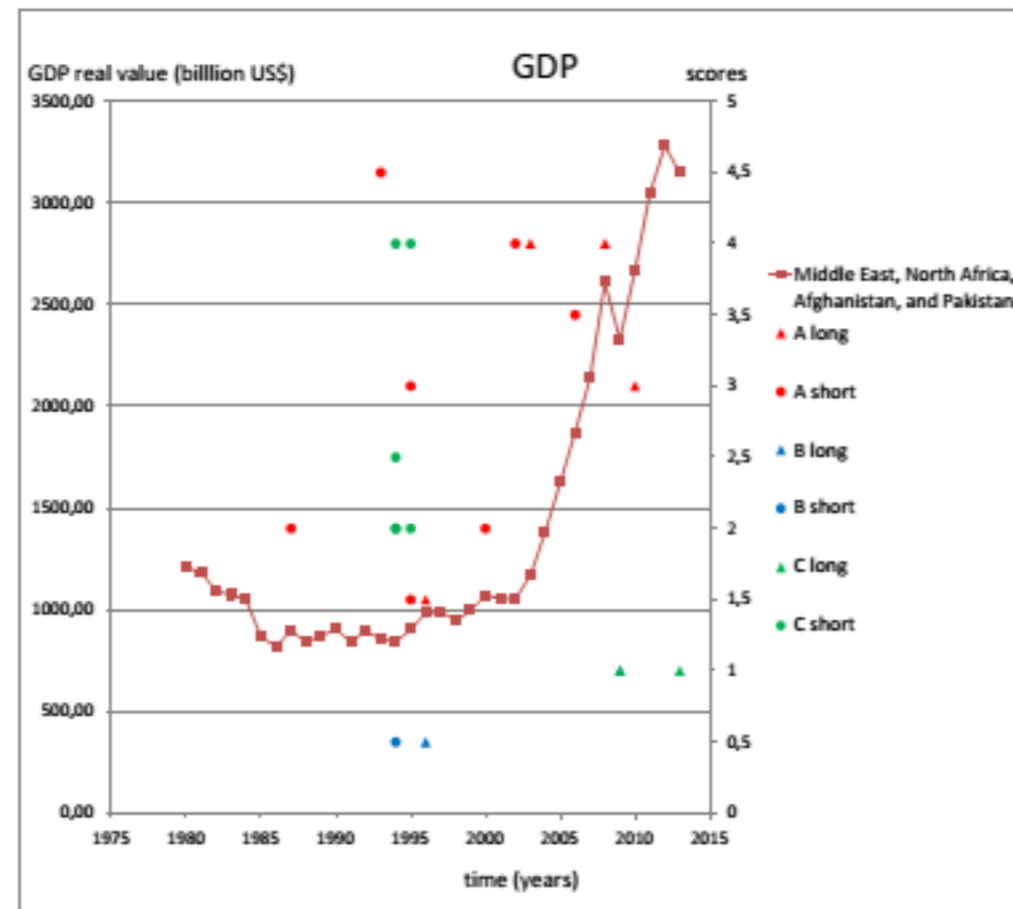
7- Middle East, North Africa, Afghanistan, Pakistan graphs

Categories A, B and C refer to the number of years between completion of the projects and the writing of the case studies:

- A: less than 3 years from completion,
- B: between 3 and 5 years from completion,
- C: more than 5 years from completion.

Long and short refer to the length of the case studies, as it is classified in the *Mendeley* database:

- short: less than 4 pages,
- long: more than 4 pages.



No graph was built for HDI, since the region defined by the International Monetary Fund did not correspond to a United Nation region (providing HDI data)

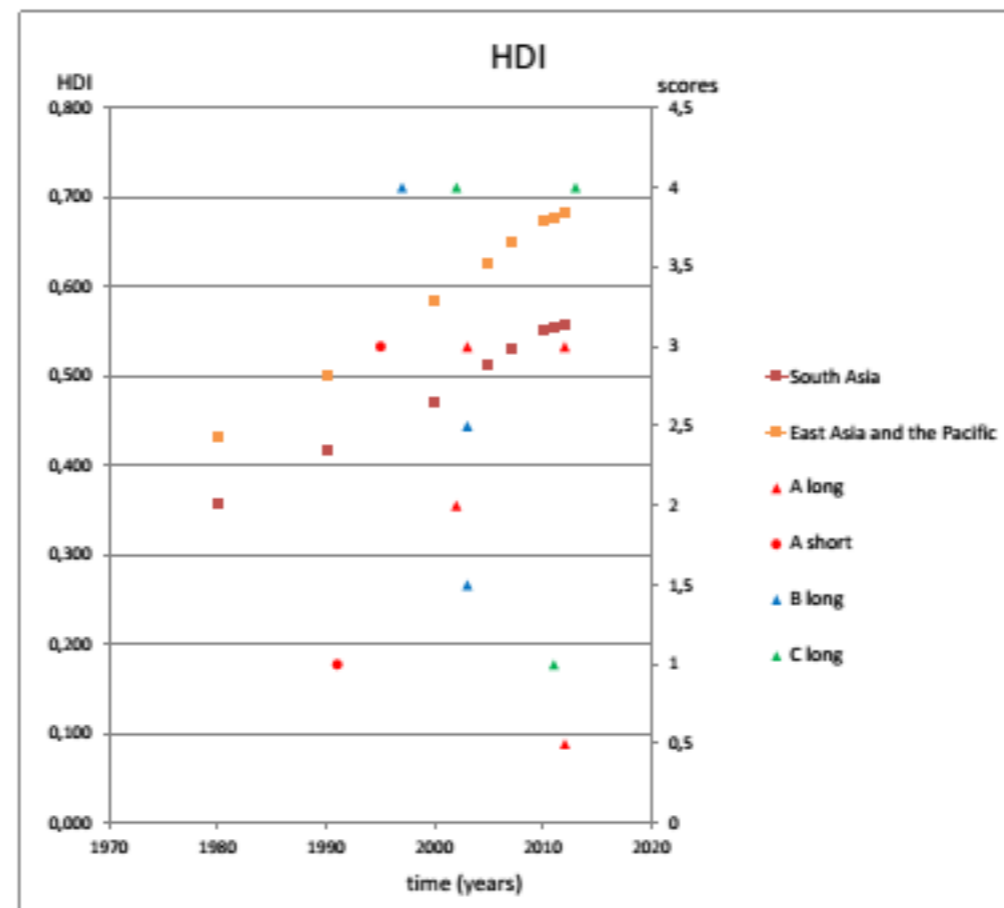
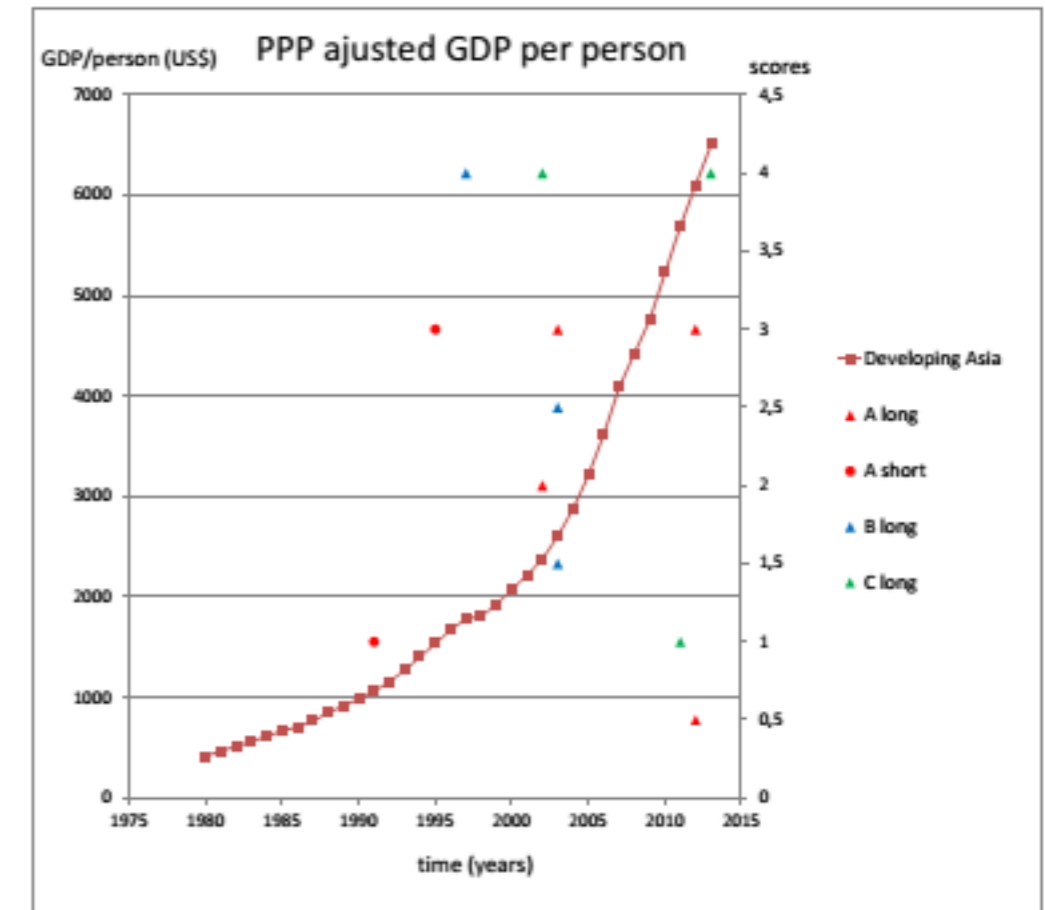
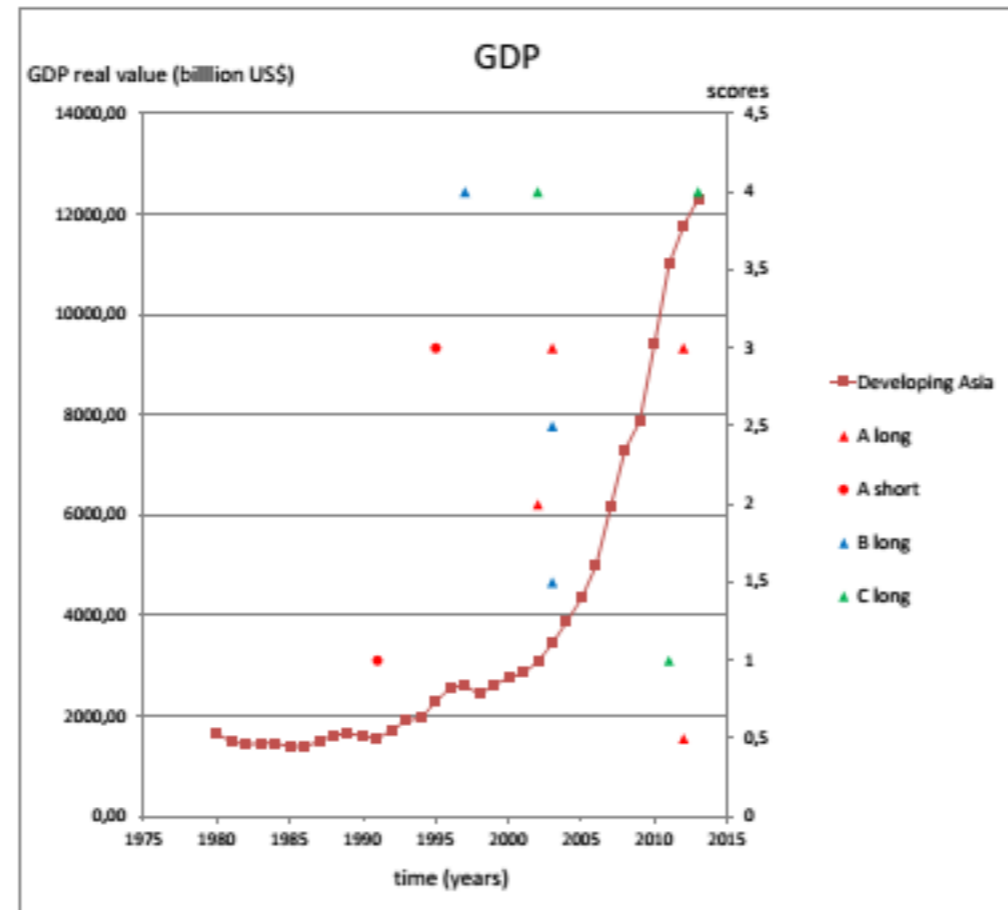
8- Developing Asia graphs

Categories A, B and C refer to the number of years between completion of the projects and the writing of the case studies:

- A: less than 3 years from completion,
- B: between 3 and 5 years from completion,
- C: more than 5 years from completion. Long and

short refer to the length of the case studies, as it is classified in the *Mendeley* database:

- short: less than 4 pages,
- long: more than 4 pages.



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