



# **Partners for Water and Sanitation**

## **Note on project reports**

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# **Partners for Water and Sanitation**

## **Anambra State Water Supply Rapid Master Planning Guidance Nigeria**

### **TECHNICAL REPORT**

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# Contents

<b>1</b>	<b>Executive Summary</b> .....	<b>2</b>
<b>2</b>	<b>Introduction</b> .....	<b>4</b>
2.1	Terms of Reference .....	4
2.2	Scope and Purpose of the Visit.....	5
<b>3</b>	<b>Introduction to Master Planning</b> .....	<b>6</b>
<b>4</b>	<b>General Approach</b> .....	<b>11</b>
4.1	Stage 1: Creating the Baseline .....	11
4.1.1	Overview .....	11
4.1.2	Sources of Information .....	12
4.1.3	Information on the Current Water Supply Situation.....	12
4.1.4	Information on Available Resources and Constraints .....	13
4.2	Stage 2: Identifying Drivers and Options .....	14
4.2.1	Identifying Drivers .....	14
4.2.2	Identifying Options .....	15
4.3	Stage 3: Options Appraisal and Scenario Development.....	18
4.3.1	Setting Targets.....	18
4.3.2	Options Appraisal.....	21
4.3.3	Scenario Development.....	26
4.4	Investment Appraisal .....	28
4.5	Outputs .....	30
<b>5</b>	<b>Guidance Notes</b> .....	<b>31</b>
5.1	Creating the Baseline.....	31
5.2	Identifying Options and Options Appraisal.....	32
5.3	Targets and Scenario Development .....	33
5.4	Investment Appraisal .....	33
<b>6</b>	<b>Conclusions</b> .....	<b>35</b>
6.1	Conclusions .....	35
<b>Appendix A: Presentations Given to the Master Planning and Policy Workshop</b> .....		<b>36</b>
<b>Appendix B: Selected Workshop Pictures</b> .....		<b>40</b>



# 1 Executive Summary

Partners for Water and Sanitation (PAWS) is a collaboration of government, private sector and NGO organisations dedicated to solving problems associated with providing access to water and sanitation in developing countries. The initial focus of the partnership is Africa.

The European Commission and the Federal Government of Nigeria agreed in December 2004 to support the implementation of the Water Supply and Sanitation Sector Reform Programme (WSSSRP) in Nigeria. The specific objective of the Anambra WSSSRP State Technical Unit (STU) is to increase access to safe, adequate and sustainable water and sanitation services within Anambra.

The Terms of Reference for this PAWS project is for support to the STU in Anambra State and the Anambra State Institutions for Water Supply and Sanitation. The STU is responsible for implementing the programme's activities in the state, with specific focus on small towns and urban areas.

This report is part of an ongoing programme of support that PAWS is providing to the Anambra state water sector as part of their reform programme. It provides an outline of an approach that could be used to help create a meaningful Master Plan for the water sector within the state. The Master Plan will initially be produced by consultants working for the Water and Sanitation Sector Reform Programme (WSSSRP), an EU funded initiative that is helping to facilitate sector reform within the state.

A potential framework for Master Planning in the water sector in Anambra has been presented within this report, along with some guidance notes on how to effectively simplify the Master Plan given the knowledge and time constraints that exist in this case. It is considered that the following key points need to be considered in order to produce a coherent plan in the time that is available:

1. A structured approach is needed in order to provide an adequate and meaningful plan. Two potential approaches have been presented, depending on the level of definition of policies and development targets that is in place at the start of the planning process. There are other approaches that could be used, but most will contain at least some of the elements presented in this report..
2. Baseline assessment needs to be based on existing information as far as possible. There are a number of very sensitised and knowledgeable stakeholders within the state that should be able to provide much of the information that is needed for the plan.
3. When assessing options, 'shortcuts', such as using 'generic' options, unit costs, and semi-qualitative analyses, should make the options identification and appraisal more achievable. 'Non monetised' issues such as difficulties in obtaining chemicals, reliable electricity, etc. are a very important part of the options appraisal process and must be included.



4. When assessing targets for inclusion within the plan, try to avoid targets where progress will be difficult to monitor given the level of information that is available within the state. Where significant data or knowledge gaps exist, the plan should concentrate on the general approaches that are likely to be used to address the associated need/driver, along with the studies and initiatives required to address key knowledge gaps.
5. Some iteration will be required between scenario development and the investment appraisal. However, it is important to use rapid assessments, assumptions and 'ranges' in both the cost of scenarios and income that is available in order to avoid too many iterations and complication in the analysis.
6. When evaluating the cost of scenarios, ensure that both ongoing/recurrent costs are included as well as costs of investment in new infrastructure.

The output from the master planning process is obviously the Master Plan itself. The structure of the plan will change, but it is vital that it contains, as an output, a prioritised list of schemes/initiatives ('options') that need to be implemented within the state. If affordability then becomes an issue, then at least the State will have an order of development for guidance, even if the timing is then different from the targets set within the plan.



## 2 Introduction

*Partners for Water and Sanitation works with developing countries providing unrivalled knowledge and expertise to help them supply clean water and adequate sanitation to their population. An innovative not-for-profit initiative, the partnership has members from three sectors: government, private enterprises ranging from water companies to engineering groups, and NGOs such as WaterAid, Tearfund and a trade union. This allows the partnership to draw from the widest possible range of expertise to rapidly respond to each unique challenge and to help local African partners develop and strengthen capacity and build truly sustainable solutions.*

*Each partner brings a unique set of skills and expertise. These are matched with a wide range of potential needs identified with partnering countries at a national or local level, working alongside their existing water and sanitation programmes. The emphasis of partner involvement is on-the-ground capacity building, such as knowledge transfer, to ensure the sustainability of each project and to encourage any lessons learned to be shared and used again throughout the region.*

*And it's not just about engineering: corporate, institutional and financial capacity building is also required. While the initiative does not itself provide funding, it often strengthens each locality's ability to identify and access available sources through the capacity building approach.<sup>1</sup>*

This report is part of an ongoing programme of support that PAWS is providing to the Anambra state water sector as part of their reform programme. It provides an outline of an approach that could be used to help create a meaningful Master Plan for the water sector within the state. The Master Plan will initially be produced by consultants working for the Water and Sanitation Sector Reform Programme (WSSSRP), an EU funded initiative that is helping to facilitate sector reform within the state.

### 2.1 Terms of Reference

The General objective for the PAWS support of the WSSSRP in Anambra is:

*'To provide technical expertise to the STU in assessing the effectiveness of the existing institutional structure for water supply and sanitation provision and make recommendations for improvement as considered appropriate.'*

*This project has been identified in the PAWS Business Plan 2008-09."*

This report follows on from a visit that was carried out by PAWS to provide a workshop on Master Planning and Policy Development for key water sector stakeholders. Following that workshop, the WSSSRP programme manager indicated that further assistance would be needed to help produce the Master Plan for the sector within the state. The ToR for this report are therefore largely verbal, but are covered by the ToR used by PAWS for the visit. The objectives contained within the ToR were as follows:

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<sup>1</sup> From the Partners for Water and Sanitation website: <http://www.partnersforwater.org/>



1. To support the sector reform team in Anambra state, through advice, on the direction for an effective water supply and sanitation policy document
2. To recommend a structure and key contents for a practicable and effective Water supply development and Investment Master plan for Anambra state.

## 2.2 Scope and Purpose of the Visit

The original scope of the visit was as follows:

‘Consultants will be procured locally by the Anambra state STU for the development of a water supply and sanitation policy document, and a water supply development strategy and sector investment plan for the state. PAWS support will be in the form of advice only, giving the necessary direction and requirements to the state sector reform team.

The PAWS team will hold discussions with selected sector actors and the STU, on the policy direction and investment dynamics of the state.

This PAWS support will not develop the policy or the investment plan documents. However, it will recommend a direction and key contents for each document.’

The primary purpose of the country visit was to carry out sensitisation and capacity building within the state by hosting a workshop that provided guidance for producing a sector wide Master Plan and a Water and Sanitation Sector policy for Anambra State. This also satisfied the first part of the scope, as significant feedback was obtained from key stakeholders prior to and during that workshop. The content of that presentation is provided as Appendix A to this report.

In order to satisfy the second part of the scope, it became clear that some form of guidance document would be required to help facilitate the rapid production of a state wide Master Plan. That guidance forms the body of this report.

## 3 Introduction to Master Planning

A 'Master Plan' basically answers the following questions for the organisation, company or sector that is being examined:

- Where are we now?
- What resources do we have?
- Where do we want to be?
- How could we get there?
- How should we get there?

These questions often form a separate sub-section of the Master Plan, which is referred to in the Anambra context as the 'Strategic Development Plan'. A final, 6<sup>th</sup> question also needs to be answered:

- How do we pay for it?

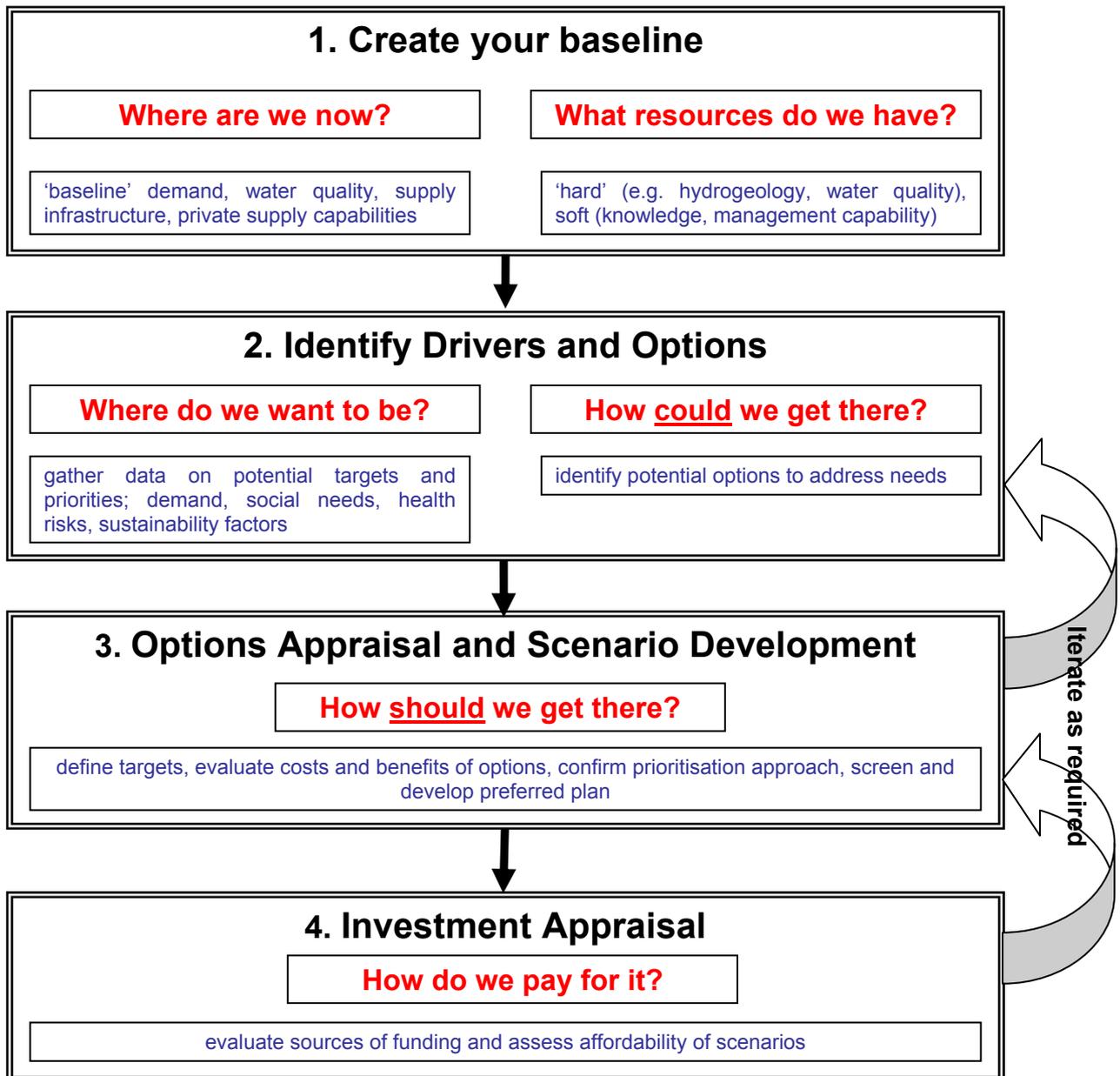
This is a key stage, which can be referred to as the 'Sector Investment Plan' and will examine sources and costs of finance including customer revenues, subsidies and debt. It should be noted that these two plans are very closely linked (as shown later), so in practice they will form complementary sections in a single Master Plan.

In general terms the Master Plan provides a structured approach to identifying and addressing the needs that exist within the water supply sector. Because this covers a large number of issues and needs at various levels (from local communities, to large urban areas, to institutions and organisations), it is impossible to produce a coherent plan without some form of structured analysis.

This report contains the outline of a structured approach that has been used elsewhere for Master Planning, which allows for comprehensive plans to be delivered. It is meant to be flexible, and whilst it can be applied to very complex, detailed analyses, it does not have to be complicated. **Because this is the first attempt at a Master Plan in Anambra and there is no embedded policy or regulation, it is very important to keep the assessment for this Master Plan as simple as possible.** Therefore, whilst this report provides structure and theory, it also contains practical tips on how to keep the analysis simple but effective.

Whilst this report contains ideas on structure and approach, these are by no means definitive and planners are encouraged to think about which parts will, and will not, work in Anambra. This will become clear as the master planning process proceeds.

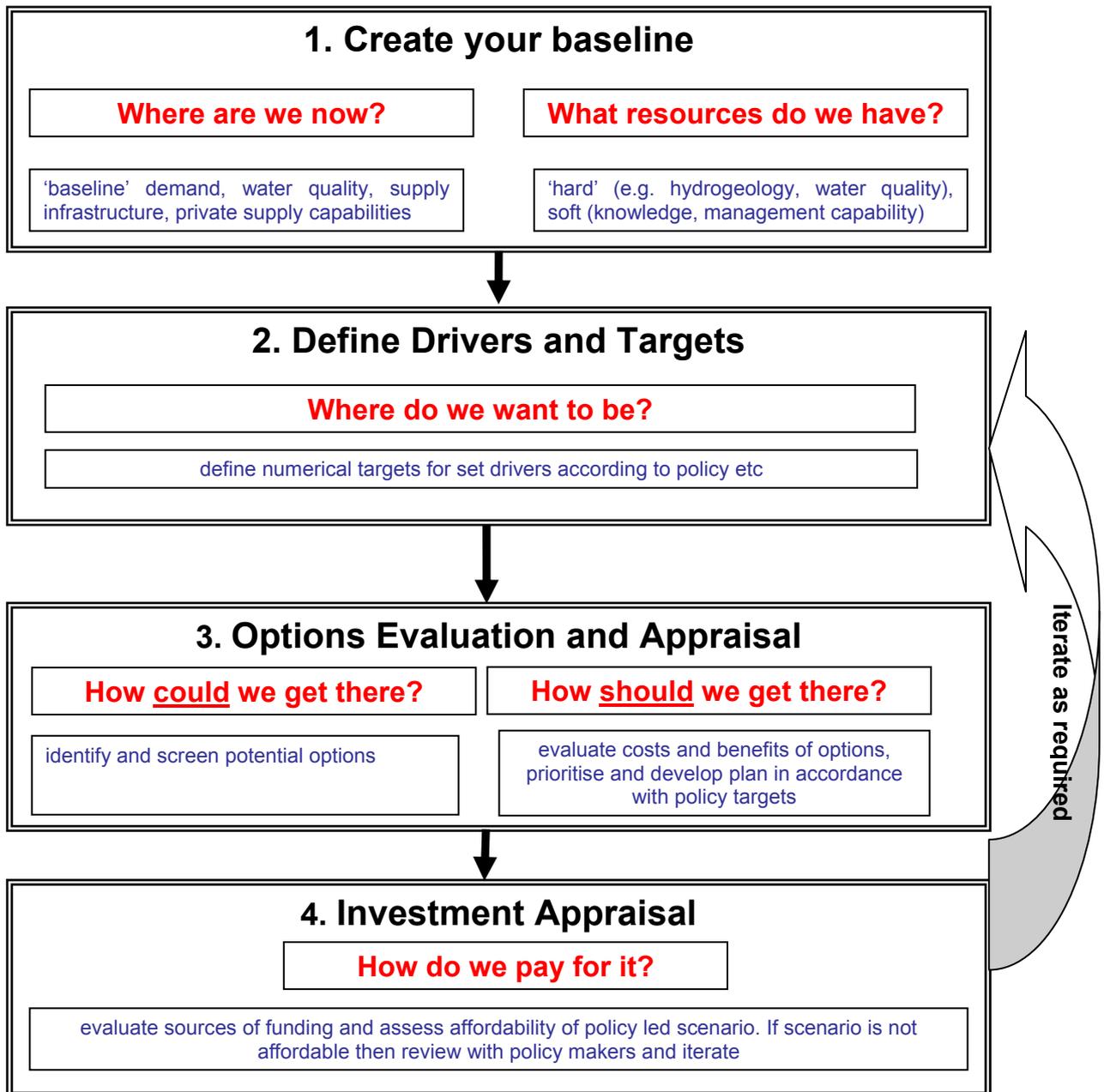
Figure 3-1 provides an overview of the sort of structure that can be adopted to help derive a clear and comprehensive plan. **It should be noted that the structure may need to change depending on the relationship between the Master Plan and available policy/targets. Figure 3.1. has been developed for the situation that is likely to exist in Anambra – i.e. the Master Plan is being developed in parallel with the state policy, and has the opportunity to help define targets for development in the state. If targets are already set, then the approach to the Master Plan needs to be slightly different, as shown in Figure 3.2.**



**Figure 3-1: Overview of the Approach to forming a Strategic Development Plan\***

*\*In this case the development of sector targets is part of the planning process*

Further details of the activities required to carry out each of the stages are provided in Section 4 of this report.



**Figure 3-2: Overview of an Alternative\* Approach to forming a Strategic Development Plan\***

*\*In this case the plan is fully Policy led and there is only one initial set of targets (i.e. one scenario). The Policy and targets need to be reviewed if the plan proves not to be affordable.*

On the face of it this second approach appears to be simpler as the targets are all set out 'up front'. However, often what will happen is that these targets have been set with no knowledge of affordability, and the process effectively becomes iterative until a set of targets are defined that are actually affordable. It is often much more difficult to determine which drivers and targets are more important under the second approach, as the planners have not been involved in their development. This makes prioritisation of schemes and options between drivers and sub-sectors more difficult.

Planners will need to decide on the overall approach depending on how much involvement they have in the development of targets for the plan. **For the sake of simplicity, this report only contains guidance on the first approach (i.e. where the Master Plan process feeds into the target development process). However, all of the individual sections that are described in this report can just as easily be applied to the second approach – they are just in a slightly different order.**

**There are three key terms in Figure 3-1, and one term in the preceding paragraph, that are defined below. These are used throughout this document, and are expanded upon where appropriate in the rest of this document.**

**Definition for Term 1: 'Drivers'**. Categorisation according to 'drivers' is an approach that is often used to provide some structure to the needs that exist within the Sector. Targets for the sector can then be set according to these 'drivers'. Improvements that could be achieved by various schemes or initiatives can then be categorised according to the 'driver' that they satisfy. This makes it easier to carry out comparisons of benefits between schemes. Typical 'drivers' include:

1. Improving the quantity of water available to consumers
2. Improving the quality of water available to consumers
3. Maintaining existing services
4. Reducing costs (improving efficiency)
5. Improving regulation and management capacity

Further details on the derivation and use of drivers can be found in Section 4.2.1

**Definition for Term 2: 'Options'**. 'Options' are alternative schemes or initiatives that can be used to achieve the required output targets under a given driver. The simplest example of this is for expansion of public water supply coverage. In a given area it may be possible to meet the target (e.g. increasing coverage from 40% to 60%) through one of two methods:

1. Construct 10 boreholes with associated localised distribution systems, or
2. Construct one spring source and treatment works with a single, larger distribution system

Each of these alternatives will have different costs and issues associated with them, but they can both meet the target that has been set. This is what an 'option' is – an individual method for reaching, or contributing towards, a set target, which can be compared against other 'options' for reaching that target (assuming of course these alternative options actually exist).

**Definition for Term 3: 'Scenarios'.** 'Scenarios' essentially represent alternative targets that the Plan has to achieve. As a very simple example, a Plan could contain two 'scenarios' for water supply improvement:

1. Improve public supply coverage to 60% with all consumers having at least one tap within each building/compound with 24 hour availability.
2. Improve public supply coverage to 60%, but with 50% of consumers using communal standpipes. Supplies are only available 12 hours per day

The key point here is that there will still be a number of alternatives (options) that could be used to achieve each of these scenarios, but the preferred combination of options required to meet scenario 1 will be different to the options that have to be selected to meet scenario 2. In reality the combination of preferred options to meet scenario 1 will cost more than the combination of options required to meet scenario 2. This is the main reason for using scenarios in Master Planning – they effectively show how the cost of the Plan will vary according to the targets it is required to meet.

**Definition for Term 4: 'Sub-sector'.** In Anambra state, because of the different types of need and the disparity of supply systems, state wide initiatives, schemes and needs have been separated into four 'sub-sectors':

- Urban
- Semi-urban
- Rural
- State-wide

Within this report, the term 'sub-sector' is used specifically in relation to the above categories. As noted, sector wide initiatives and actions are also considered as being a separate 'sub-sector' of development.

These sub-sectors relate to classifications within the Federal policy on Water Supply and Sanitation, where 'rural' refers to settlements <5000 people, 'small towns' are settlements between 5,000 and 20,000 and 'urban' is >20,000. There are some problems with the demarcation of 'small towns' versus urban and rural communities within Anambra, but it is important to keep the sub-sectors to remain consistent with Federal level funding availability. Consultation with stakeholders will be required to decide how to separate the sub-sectors in the Anambra context.

## 4 General Approach

This Section contains technical notes on the approach and content of each of the four stages involved in developing the Plan. It attempts to be comprehensive in order to cover the eventualities that might be encountered within Anambra State. This may make some sections appear complicated, but practical notes on keeping the approach simple and manageable are contained in Section 5 of this report.

Although the four stages are presented separately, it should be remembered that this is a single, coherent process. In particular, the development of scenarios and investment appraisal are strongly interlinked. Notes on this are given below.

### 4.1 Stage 1: Creating the Baseline

#### 4.1.1 Overview

The creation of the baseline is essentially a data gathering exercise. The type of information that needs to be gathered can be separated into three broad categories

1. Information on the Current water supply situation
2. Information on (non-financial) resources that are available for improving water supply
3. Information on the constraints to development that exist within the state

Information on what may be required under these categories is given below. Because the availability of resources and constraints on development are inherently linked, these have been grouped together.

In terms of format, it is generally advisable to ensure that information can be viewed geographically. Information needs to be accessible on a geographical basis because:

1. Water is a physical substance, so its availability, quality and ease of distribution varies according to geographical parameters (topography, hydrogeology, hydrology etc).
2. The needs and demographics of consumers (population density, income, housing type etc) also vary according to area, so the targets for development will tend to be set based on areas.

This does not mean all information has to be held in maps or Geographical Information Systems (GIS), although these will certainly form part of the data. Information on physical entities (river hydrology, aquifer parameters, populations etc) can be held in tables or databases and divided into areas that can be identified on a map. Information on non-physical entities (information on institutions, private sector activities, cultural issues etc) can also be sorted geographically, although this will not always be the case.

#### 4.1.2 Sources of Information

Master Plans are meant to provide an overview of requirements. The scale and coverage of this when attempting a sector wide state plan is very large, so it is very important not to become involved in a process that attempts to know everything about the baseline before the plan is produced. **This means there are two critical considerations when putting together a baseline for a Master Plan:**

- 1. Use local knowledge and existing information where possible.** Institutions within the sector are likely to hold most of the information that is needed and may hold specific reports on some key aspects. Use the personnel and data from these institutions to form the baseline.
- 2. Addressing key knowledge gaps can be part of the development options recommended by the Master Plan.** Large studies or the creation of key knowledge management systems (e.g. GIS) can be part of the recommended plan. These can require significant investment (and even ongoing maintenance) and are just as much part of an option to help improve water supplies in the state as, for instance, yet another borehole.

If it is felt that a Master Plan simply cannot be put together without some key missing data – in other words if the outcomes of the options appraisal are highly sensitive to the lack of information - then this will have to be generated as part of the planning process. However, remember this is a high level ‘birds eye view’ of requirements, so try to use scanning studies, sensitivity tests and realistic assumptions where possible. These can always be validated and improved through planned studies prior to the issuing of the next plan.

#### 4.1.3 Information on the Current Water Supply Situation

This part of the baseline is fairly obvious. It involves finding, collating and (geographically) sorting information that is available on current water supplies and water availability across the state. This would typically include:

- Physical infrastructure (boreholes, supply schemes, community schemes etc)
- Population and potential demand attached to existing schemes/boreholes (working or not)
- Population served and types of private supply
- Information on existing water quality (public and private supplies)
- Location and nature of identified or perceived water quality issues
- Data on current system reliability, average distance to nearest standpipe etc

This list is not exhaustive, and really any data that can be found on the current supply systems and supply situation should be gathered and sorted.

#### 4.1.4 Information on Available Resources and Constraints

It is necessary to identify what physical and institutional resources are available to achieve the improvements required within the state. Although financial resources form a key part of the plan, this section refers to non-financial resources. The identification and evaluation of financial resources is carried out later in the process, once the cost of the Master Plan scenarios starts to become clear.

Actual water resources are, of course, a key part of the baseline information that needs to be gathered. Information on borehole yields, extent, reliability, water quality of aquifers is needed, as well as hydrology and seasonal water quality within surface waters (rivers and springs).

As well as water resources, human resources and other non-water resources also need to be considered. This does not mean obtaining detailed information on staff names, qualifications etc within specific institutions, rather it refers to a broader level assessment of capabilities that could affect the ability of the sector to deliver improvements. Such items include:

- Procurement capability – what is the general level of technology and replacement parts available within the state? Are chemicals and power reliably available?
- Institutional capabilities – what are institutions currently capable of delivering? What are they not able to do effectively?
- Private sector activities – what is their skill base? What challenges/opportunities could they present to the expansion of public supplies?

Finally there are a number of constraints that need to be considered which could increase costs, prevent certain approaches to development, or even prevent development in certain areas. These can be broken down into:

- *Physical constraints* – areas prone to flooding/erosion, areas encroached (or likely to be encroached) by building activities, topography, hard/unsuitable soil types, drought vulnerability, etc
- *‘Soft’/human constraints* – policy controls, cultural issues, etc

## 4.2 Stage 2: Identifying Drivers and Options

As baseline information is gathered and relationships are built with the key stakeholders, it should be possible to identify two things:

- 1) What the various issues and water supply needs are in the different areas of the state
- 2) What schemes, initiatives and activities could be carried out to address those needs

Identifying these ‘drivers’ and ‘options’ basically forms stage 2 of the Master Planning process. This process will involve a fair amount of overlap and iteration with stage 1 – e.g. a need might be identified before much of the baseline data that is required to evaluate and address that need has been gathered.

### 4.2.1 Identifying Drivers

As needs are identified, these can start to be sorted into ‘drivers’ (as discussed in Section 3). Some potential ‘drivers’ that might be considered are given in Table 4-1 below. These provide an illustration of what is meant and should be amended/built on as the understanding of need in the sector is increased. Each driver effectively groups a number of targets which allow the benefits of maintenance activities, development schemes and initiatives to be assessed. More information on targets and their relation to drivers is given in Section 4.3.

	<b>Urban</b>	<b>Small Town</b>	<b>Rural</b>	<b>State Wide</b>
Driver 1	Increase water delivered by ASWC	Increase population served by public supply schemes	Increase accessibility to ‘improved’ supplies	Improve regulation
Driver 2	Improve water quality	Improve water quality	Improve reliability of installed ‘improved’ supplies	Improve institutional efficiency
Driver 3	Improve serviceability to customers	Improve reliability of public supply schemes		Improve private sector water quality
Driver 4	Improve viability of ASWC	Improve viability of WCAs		
Driver 5	Reduce cost of water			

**Table 4-1 Example Drivers for the Anambra State Water Sector**

#### 4.2.2 Identifying Options

The identification of options can be one of the most difficult, but important, parts of the master planning process. The type and level of options that will need to be identified will vary according to:

1. The 'sub-sector' that is being evaluated (urban, rural etc)
2. The primary driver they are trying to meet
3. The area, and level of knowledge about the baseline in that area, that they are being developed for.

This is best illustrated by examples that show some of the 'extremes' of potential option types, even under the same driver:

- For Awka there is a proposal to develop a Greater Awka supply scheme. Under the master planning framework, the development of a scheme such as this would fall under the primary driver of increasing water delivered by ASWC. During the baseline assessment stage it should have become apparent that the best way to geographically divide assessments that relate to the urban sub-sector will be to separate them according to the major urban centres (Awka, Onitsha etc). The Greater Awka supply scheme would therefore form one of the 'options' for increasing water delivered by ASWC within the Awka Master Planning area. This would be grouped with other schemes that might fulfil this driver in the Awka area.

It should be noted that the Greater Awka scheme actually has a number of major sub-options that could form the final engineered scheme. Depending on how different these are it may be prudent to separate the Greater Awka scheme into a number of distinct options so they can be properly, objectively compared. In this case it is known that there are potentially significant concerns about bankside erosion of the closer river intake site, but the alternative would require considerably more pipeline and hence cost. In this case it may be appropriate to include the two Greater Awka scheme alternatives as separate options – probably named according to the intake site.

- On the rural side, it is not realistic to try and identify every rural water development that could be installed in each area. In that case the options for meeting the driver of increasing accessibility should be generic and based on identifying the general level of outputs that could be expected by installing boreholes or improved spring/stream supplies to communities in various parts of the state. This is probably best done based on a geographical review of physical parameters (aquifer properties, topography, satellite imagery, erosion/flooding areas, development rates/pollution potential). This should allow a reasonably broad classification of potentially suitable approaches and likely outcomes (in terms of yield and flexibility of supply points) in the different rural areas of the state.

There will tend to be fewer options for sector wide initiatives, but there will usually be more than one route for achieving the relevant output targets. For example, if a driver is to improve water quality compliance amongst private sector water sellers, there may well be a number of distinct approaches and legislative tools that could achieve this. These are effectively the 'options' that could be used under that driver. It is important to note that every single, slightly different, approach does not need to be catalogued and put forward as an option. 'Options' should relate to the major, significantly different, approaches that might be available. Details of the legislation, procedures and regulation that are then used to implement the preferred option are created after the Master Planning process is complete. It is important to remember that the Master Plan is a high level document that identifies the best way of achieving the targets for the sector. It does not contain the details. This applies to legislative/regulatory mechanisms as much as it does the detailed design of engineering schemes.

There are two basic steps to the identification of options:

1. **Screening.** This step relies on experience and local knowledge. Basically it involves removal of options or approaches that don't warrant any significant analysis. This can be for a number of reasons, such as:
  - The scheme or approach is clearly going to be too expensive to justify the benefit. Typical examples might include trying to build main river abstraction schemes that would only serve one or two small communities, or trying to use individual household metering as a form of demand reduction.
  - The scheme or approach has a high risk of failure. This might include deep borehole drilling in areas where there are known water quality problems with exploiting confined aquifers. Certain highly authoritative approaches to control water quality may be discounted without any real analysis simply because of the lack of capacity to deliver and the likely corruption and civil unrest side effects that could result.
  - The type of scheme or approach hasn't worked in other areas with similar needs and resources. This sort of information may become available during the baseline stage.
2. **Option description.** Once ideas on schemes and approaches have been screened, then these need to be described in a format that is comparable with other schemes or approaches under the same driver in the same sub-sector (urban, rural, sector wide etc). This 'format' should be appropriate to the level of complexity that is needed for that driver and sub-sector. The trick to identifying the right level is, once some information on options is known, to think ahead one stage and get an initial view of what the targets and options appraisal are generally going to be for that sub-sector and driver. Guidance on that process is contained in Section 4.3 of this report. The key point with the definition and description of options is to ensure that there is enough information to allow costs and benefits to be evaluated consistently between options within each driver in each sub-sector.



As indicated in point 2) above, it is clear that the options identification stage (stage 2) and options appraisal stage (stage 3) are fairly iterative – i.e. the sort of options that are being identified will influence how the options appraisal is carried out, and the options appraisal process influences how options are described.

## 4.3 Stage 3: Options Appraisal and Scenario Development

Stage 3 is where the actual plan(s) for development in the sector are initially identified and costed. The content and cost of the ‘scenarios’ developed at this stage are then fed into the investment appraisal stage in order to evaluate their affordability. As noted previously, Stages 3 and 4 are closely linked, and in practice it is a good idea to have some initial idea of the level of cost recovery and sector investment that may be available whilst scenarios are being developed.

### 4.3.1 Setting Targets

**This section contains a number of ‘example’ targets that could be used to direct and measure development progress within the water sector. It is important to note that these are fairly long lists and many of these targets will not be appropriate to the Master Plan. They should be treated as guidance only. The targets contained within the Master Plan should be based on the needs of the sector and the practicalities of producing a plan to meet the targets given the time available.**

In order to develop the plan, it is first necessary to set up targets for development for each driver in each sub-sector. Potential inputs to this process include:

- Information on needs and spatial/sectoral variation in needs, gathered during the baseline stage
- Policy documents, including Federal and draft State policies
- Consultation with stakeholders

**It is important to remember that targets need to represent outputs, not inputs.** For example ‘building 10 borehole schemes’ is not an output. This is a potential option input that could achieve the output, which would be to provide improved water supplies to a given number of communities or people. There may be other ways of achieving a given output target, which is why inputs are regarded as options, not targets.

**If the plan is policy led, as shown in Figure 3-2, then targets will be set before options have been identified and the setting of drivers and targets becomes a single process based on the policy. In that case the options identification and options appraisal both follow on from the setting of targets.**

The relationship between drivers, targets and options is important as it helps to simplify the options appraisal process. Basically targets are grouped according to their common theme, which is referred to as a driver. Options are always evaluated against their primary driver – i.e. the main reason for building or implementing that option. If an option provides additional benefits for other drivers, then these can be considered as a non-numerical advantage outside of the main options appraisal for that driver. However, the ranking of options should always be carried out according to their contributions towards the primary driver. Where there is more than one target within a given driver, then options can either be assessed against the most important target within that driver, or some form of weighting/grouping can be used to see how each option contributes towards the targets in a given driver. The key point is that the driver allows targets to be grouped and hence helps simplify the options appraisal process.

It may be sensible to identify more than one target for each driver. Table 4-2 gives some examples of targets that may be sensible for the urban water supply sub-sector.

		<b>Target 1</b>	<b>Target 2</b>	<b>Target 3</b>
Driver 1	<i>Increase water delivered by ASWC</i>	Increase water delivered in existing service areas to (XXX) l/h/d by (year)	Increase percentage of population served in all urban areas to (XX%) by (year) with a service level of (YY)	Ensure targets 1 & 2 can be met for droughts with a (1 in X) year return period
Driver 2	<i>Improve water quality</i>	Ensure (XX)% of all quality samples taken at customer taps meet basic WHO standards by (year)	Implement Water Safety Plans in (XX) service areas by (year)	
Driver 3	<i>Improve serviceability to customers</i>	Ensure (XX) hours of availability of water per day by (year)	Ensure supplies are interrupted, on average, for no more than (XX) days per year by (year)	
Driver 4	<i>Improve viability of ASWC</i>	Increase billing and recovery rates to (XX)% by (year).	Achieve sustainable cost recovery of all O&M expenditure by (year)	
Driver 5	<i>Reduce cost of water</i>	Reduce number of staff per connection to (XX) by (year)		

**Table 4-2. Examples of Targets According to Drivers in the Urban Sub-sector**

There are a number of key considerations that should be apparent from this table:

- Where possible, targets should be quantified and given time horizons. There does not necessarily have to be a specified target for every year of the plan, but it is normal to at least have a final target that is to be achieved by the end of the plan.

- Some targets can be explicitly met by a specific list of options within the Master Plan (e.g. engineering schemes to increase output of water in existing service areas). However, other targets will need to be met based on generic approaches and list of schemes that outline the preferred 'route' for achieving that target. This is particularly appropriate for small towns and rural schemes, as discussed later.
- Some targets will clearly need one or more institutions to produce and implement initiatives to meet them. In those cases the Master Plan needs to identify generic approaches and who is responsible for developing and enforcing them. Where necessary it should refer to other plans and legislative instruments (e.g. regulations) that need to be developed in order to implement the approach. For instance, increasing billing rates and recoveries, or reducing staff costs will require specific tariff action plans, billing system improvements, 'marketing' initiatives, restructuring plans etc. These details are clearly outside of the remit of the Master Plan, and the initial costs and benefits (in terms of improving cost recovery, reducing costs etc) will be difficult to determine before the plans are drawn up. However, the Master Planning process could involve a review of the potential approaches and realistic outcomes that could be expected from such initiatives. These are particularly important where they have a large impact on the investment appraisal process.

Table 4-1 gives examples of the sorts of targets that might be considered in the small towns, rural and sector wide categories. For simplicity it only contains descriptions of the types of targets, rather than the quantified, timed descriptions provided for the urban sub-sector above.

Small Town		Rural		State Wide	
Driver	Example Targets	Driver	Example Targets	Driver	Example targets
Increase population served by public supply schemes	<i>Percentage/number of small town communities with a supply scheme in each LGA</i>  <i>Percentage small town population served in each LGA</i>	Increase accessibility to 'improved' supplies	<i>Percentage of rural communities supplied by 'improved' supplies in each LGA</i>	Improve regulation	<i>(milestone targets for production of regulatory guidance documents)</i>  <i>Implement a robust Business Plan and tariff setting process for ASWC</i>  <i>(milestone targets for the implementation of WIMAG compliant funding systems)</i>
Improve water quality	<i>Percentage of WCA schemes visited and sampled for water quality in the year</i>  <i>Percentage of samples from WCA managed schemes meeting WHO standards</i>	Improve reliability of installed 'improved' supplies	<i>Number of scheme failures requiring LGA or RUWASSA intervention</i>	Improve institutional efficiency	<i>Cost of government subsidies for existing water supply schemes</i>  <i>LGA and ministry operating costs</i>
Improve	<i>Average number of</i>			Improve	<i>Percentage of</i>

reliability of public supply schemes	<i>days of supply interruptions per WCA in each LGA area</i>  <i>Average number of hours of water availability across all WCAs in each LGA</i>			private sector water quality	<i>private suppliers visited and monitored in year</i>  <i>Percentage of water quality tests meeting WHO standards</i>
<i>Improve viability of WCAs</i>	<i>Percentage of WCAs requiring government subsidies for O&amp;M expenditure</i>				

**Table 4-3: Example Targets for Small Town, Rural and Sector Wide Categories**

As noted previously, many of the ‘options’ for meeting targets in the rural and small town categories will need to be generic. For example, an ‘average’ borehole scheme in a given area will meet the needs of X households, which will mean Y boreholes will be needed to meet the needs of an ‘average’ sized rural community in that area. Not only can such ratios be used to examine the costs and benefits of boreholes in comparison to improved ‘traditional’ supplies, but they can also be used to determine the number of borehole schemes that are likely to be needed to meet the target for provision of ‘improved’ supplies in that area.

Most of the sector wide targets will require fairly specific documents or initiatives to achieve them, and there will often be very few (or even no) alternative options that could be used to meet each target. In many cases the activities required actually represent stages in a process rather than alternative options for achieving that target. As noted previously, the Master Plan does not actually have to contain the documents or legal instruments that will be needed to meet such targets, but should include the costs and potential alternatives associated with such initiatives.

#### **4.3.2 Options Appraisal**

The options appraisal process is perhaps the most difficult part of the Master Planning process to describe, as it depends heavily on the development drivers and targets, baseline information and level of information on options that is available to the planners. The section below contains some guidance on the sort of approaches that can be used for various types of drivers in each development sub-sector, but it is not exhaustive.

The key point to remember about the options appraisal process is that it is there to compare the costs and risks associated with options against the benefits that the options provide in meeting specific targets for each driver in each area in each sub-sector.

The most ‘simple’ form of options appraisal is the process that is used for comparing engineering options that could be used to meet a physical output target. In this case some form of cost/benefit analysis is used. This is often modified by risk or sustainability criteria that cannot easily be costed, but are likely to influence the success of the plan that is adopted.



As an example, a 'typical' process that could be used to identify the most suitable option(s) for meeting the 'increasing percentage of population served' target in a given urban area is shown in Figure 4-1.

It should be noted that this example relates to the provision of additional production and bulk transfer into the distribution system. In order to serve the increasing number of customers, it will also be necessary to expand the local distribution systems. The Master Plan needs to include the cost of distribution system expansion, but this is likely to be added as a 'fixed' cost as there are no alternative 'options' as such for increasing the local distribution system.



Obviously there are some complications to the above example, primarily in relation to the decision over the percentage of people that are served by standpipes, yard taps or internal plumbing. However, it is suggested that these are regarded as policy decisions that affect the demand for water and form the basis of alternative 'scenarios' (as discussed later), rather than as options. In other words, the policy on service levels affects the targets for development (and hence the amount of water that needs to be supplied), rather than the options for meeting those development targets.

**When assessing the cost and AIC of an option, it is vital to include the operational and maintenance costs, as well as the initial construction costs.** This is why NPV analysis is used. If these are not included, then the plan will tend to include large amounts of lower initial cost schemes that end up placing large O&M burdens on the sector that cannot be covered by the tariffs that are collected from consumers.

**AICs are an initial indication of the suitability of options.** Following AIC ranking, 'non-monetised' costs, risks and benefits need to be considered and the ranking adjusted accordingly. This is particularly important where issues such as the availability of power, chemicals and spare parts, institutional capabilities, erosion/maintenance risks etc can be more important to the viability of a scheme than the 'theoretical' cost and benefit.

For appraisals that involve large numbers of generic, or relatively poorly defined, options, there are two concepts that need to be applied in order to carry out the options appraisal:

1. **Semi-qualitative evaluation.** This is where costs and benefits are set according to descriptions of their costs and benefits, rather than specific numbers (e.g. very high, high, medium, low, very low). Often these descriptions relate to defined estimate ranges – e.g. 'very low' <\$1,000, '\$1,000<low<\$5,000 etc.
2. **'Unit' costs and benefits.** Where schemes or approaches in a given area are likely to have similar costs for a similar output, then an 'average' cost and benefit could be assigned to all schemes of that type in that area. For example, a 'typical' borehole and hand-pump arrangement might cost \$5,000 in a given area (based on experience and hydrogeological conditions) and provide an average flow rate of around 5l/min.

These can assist the evaluator in 'ranking' different generic options or groups of more specific options to determine what the preferred order of development is likely to be in a given area for that sub-sector.

For example, in a given area for the rural sub-sector, the baseline assessment might have shown that there are a number of springs that could be improved to give protected supplies with community based distribution to a number of communities. These have been evaluated in semi-qualitative terms according to their expected costs and outputs. Comparison against unit costs and benefits for a 'typical' borehole installation in that area shows that any spring source with 'high' or 'medium' benefits, that does not have a 'high' cost is likely to be more cost effective in achieving the output targets than an equivalent borehole installation. Based on this, the number of people (or number of communities) that can be supplied by the 'cost effective' spring sources is evaluated and compared against the targets. If there is a shortfall, then the evaluator knows that the remainder of the target will have to be met through the installation of boreholes, and calculates the number and cost required based on the 'unit' cost and benefit of the borehole sources in that area.

The options appraisal process for sector wide initiatives, or initiatives that relate to cost cutting measures etc, will usually be based on semi-qualitative evaluations of costs required to meet the target (i.e. the 'benefit' of all of the alternative options is 'to meet the target'). This will usually be modified by a qualitative analysis of the risks and issues that could be associated with each approach. For example, if the 'target' is to achieve compliance with WHO quality standards amongst private suppliers, then there could be two alternative approaches:

1. A rigorous programme of government inspector led testing, with fixed penalties resulting ultimately in the shut down of the supplier
2. A programme of voluntary testing and certification accompanied by an advertising and community sensitisation that would give those suppliers that have certificates a large commercial advantage over those that don't.

Initial evaluation might conclude that both approaches should achieve the required percentage compliance targets, but the first approach is significantly more expensive and more liable to lead to corruption. However there might be a significant risk that the second approach will not be as successful as the initial analysis would suggest. In this case consultation is needed with stakeholders to determine the significance attached to missing that target within the required timescale. This can then be compared with the affordability issues represented by adopting the first, more certain, approach.

Finally, if there are targets where the options appraisal process does not seem to be appropriate, or where there is insufficient information to evaluate and appraise options, then it is suggested that two courses of action can be taken for the Master Plan:

1. That particular target could be dropped as an objective for the Master Plan. If this relates to a policy requirement, then the fact that the target 'exists' needs to be acknowledged and the potential implications on sector development need to be (briefly) examined. However, it is suggested that the particular target is removed from the 'scope' of the Master Plan.

2. If the target is important and could have significant implications for sector development, then the Master Plan should identify why an options appraisal has not been possible, and what actions need to be taken in order to include that target in future Master Plans. This will normally involve studies, working groups etc and it may be possible to include the cost of such activities in the Master Plan and Investment Appraisal process (to check that such studies/investigations are affordable).

### 4.3.3 Scenario Development

The requirement for, and development of, alternative scenarios basically depends on three things:

1. How much definition (and uncertainty) there is in sector policy and hence targets for the state. Ideally the Master Planning process should have some links to the sector policy development, as the Master Planning team will have ideas of costs and difficulties associated with meeting some of the targets that are being considered for the sector.
2. Initial indications of the cost and affordability of targets that are being proposed. This can be difficult in advance of the investment appraisal, but really the scenario development and investment appraisal stages will always be fairly iterative. If possible, early findings of the options appraisal and costs would be shared with stakeholders to gauge reactions to the affordability of the targets that are being proposed.
3. How much time is available for scenario development. Realistically it will be difficult to appraise more than two or three scenarios given the complexity of the options appraisal process associated with each scenario.

As stated previously, 'scenarios' are simply different combinations of targets that will, naturally, have different combinations of options that will be needed to meet those targets. Scenarios therefore differ from options. The most simple way of looking at it is that the options appraisal process is used to identify the most cost effective way of meeting the targets within a given scenario. The choice of scenarios is down to the development policies and hence targets that the State wants to implement in the sector.

Usually the scenarios will be developed to reflect a range of costs – e.g. low, medium and high range scenarios, with lower, more easily achieved targets for most (or all) drivers in the low range scenario. When considering scenarios, it is probably best to consider the importance and flexibility of drivers and sub-sector targets in relation to each other. Less important/more flexible drivers and sub-sector targets are more likely to be changed between scenarios, whereas critical, fixed targets may stay the same across all of the scenarios.



If the plan is policy led, as shown in Figure 3-2, then there is effectively no need for scenario development as the targets for each driver in each sub-sector will already have been set. In that case the plan moves straight from the options appraisal process through to the investment appraisal. However, if the policy led scenario proves not to be affordable, then iteration will be required. The planners may even have to carry out some form of scenario development to aid policy makers in re-assessing targets

## 4.4 Investment Appraisal

The investment appraisal is essentially a comparison of the cost of a particular planning scenario compared with the sector investment and income that is likely to be available to meet the targets contained within that scenario.

The total cost for meeting the targets in a given scenario will naturally follow from the options appraisal process. **It is important to remember that the ‘total’ cost in each year for a scenario should include all costs, i.e.:**

- ‘Initial’ (construction) capital costs
- Operational costs
  - Power, chemicals,
  - Staff
  - Ongoing maintenance
- ‘Recurring’ capital replacement costs
  - MEICA assets
  - Civil assets
  - other

Obviously ‘staff costs’ should include the cost of running relevant government departments, and ‘other’ includes fuel, logistics etc.

The other side of the investment appraisal is to determine what funds are likely to be available for investment and ongoing operation. In the Nigeria context there is a clear indication from the Federal level that operational costs should be entirely met through tariffs and community funding. However, in practice there will be a period of subvention (with associated institutional reform programmes), particularly in the urban sub-sector, before this can realistically be achieved.

Funding of operations within the Master plan is therefore heavily reliant on a meaningful and realistic **tariff action plan**. This is being looked at as a separate project within the WSSSRP, but there will need to be good communication between the master planning project and the tariff setting project because:

1. Customer willingness to pay will increase as outputs relating to ‘serviceability’ (availability, reliability and quality of water supplies) improve. The amount of tariff recovery will therefore depend on how well and quickly targets relating to serviceability are met.
2. The amount of revenue generated by customers increases as the customer base increases. The amount of tariff potentially available therefore depends on how quickly, and importantly, where supplies are extended to.
3. Similarly the amount of revenue generated will also change according to sector wide or generic initiatives (such as institutional reform plans for ASWC, licensing, regulatory improvements etc).



The content of the Master Plan will therefore have a significant impact on tariff availability, just as much as tariff availability will affect the affordability of the scenarios within the Master Plan.

Although there is less of a direct link, the amount of capital investment will also depend to a certain extent on what is planned within the state. Some of this is obvious; for instance the Federal Policy provides explicit guidance on the capital funding that is available for water supply schemes in each of the sub-sectors. The balance of investment between sub-sectors, and the regulatory regime that is proposed for the state, will therefore directly impact on available funding for the sector. There are likely to be other, more subtle impacts as well, such as the fact that the development and successful implementation of a plan is more likely to attract international donors.

This interdependence means it is very difficult to come to the 'right' answer in terms of the investment plan, which is one of the reasons why it is recommended that a limited number of scenarios are examined. It is also likely that there will need to be a fair amount of assumptions over tariff recovery and availability of investment funds. In reality this is not critical. As long as the plan is 'reasonably' affordable, then higher or lower cost outturn, tariff collection, or investment, will simply mean that targets are either deferred or brought forward as the plan is implemented.

An investment plan should ideally look at total cashflow versus total costs for each of the sub-sectors in each year of the plan. In practice this may take too much time and analysis, and costs versus revenue could be assessed as five year totals etc.



## 4.5 Outputs

The output from the master planning process is obviously the Master Plan itself. The structure of the plan will change, but it is vital that it contains, as an output, a prioritised list of schemes/initiatives ('options') that need to be implemented within the state. If affordability then becomes an issue, then at least the State will have an order of development for guidance, even if the timing is then different from the targets set within the plan.

## 5 Guidance Notes

The process of Master Planning can be extremely detailed and time consuming, particularly where very large sums of money or detailed regulatory requirements are involved. However, it is very important to remember that this is the first such plan that has been developed for Anambra state. This means there will be considerable uncertainty and information gaps for the baseline, options and targets in the sector. The plan will therefore need to contain a fair number of simplifications and assumptions. This is completely acceptable, as long as critical needs are addressed and a plan can be produced that provides a meaningful foundation for the initial reforms and service expansion that is planned in Anambra.

The sections below contain some points that might be considered to help with these simplifications and assumptions in order to produce a meaningful plan in the timescales that are available.

### 5.1 Creating the Baseline

For a plan of this type, it is extremely important to try and obtain and use information and data that is already available in the state. The Ministry of Public Utilities, Water Resources and Community Development, ASWC, RUWASSA, Ministry of Economic Planning and Development, Ministry of Health and Local Government Associations should all have 'local' information on technical issues, population, institutional capability and variations in needs across the state in each sub-sector. WSSSRP, the Federal Ministry of Water Resources, UNICEF and the EU should also have reports ranging from rainfall and hydrogeological data through to willingness to pay surveys and surveys of private sector involvement. Other NGOs may have information on population, income, needs, quality of traditional sources, etc. PAWS reports can give some background on sector institutional structure and reforms.

It should be possible to build the Master Plan largely on the data that is available. It may be necessary to carry out some extrapolation (e.g. of hydrogeology to less well known areas), modification (e.g. of any simple catchment models) or 'sense' checking. However, in order to allow time for options appraisal and scenario development, it is critical that a large proportion of the baseline stage is collected quickly, and that surveys to create base data are avoided unless absolutely necessary. It is probably better to use reasonable assumptions and extrapolations to allow more time for the development of the plan, rather than delaying the process whilst in depth surveys are completed.

The use of 'unit costs' is discussed in Section 5.3 but when creating the baseline it is important to look for information that can provide indications of unit costs for the options appraisal stage. This basically means looking for regional, national or local data on construction outturn costs for items such as pipelines, boreholes, treatment processes, spring protection programmes etc. Collection of general costs for power, chemicals and other common materials is also important. 'Asset lives' for depreciation purposes can probably be based on international standards. Stakeholder experience within the state can probably then amend some of these where particular issues exist for particular asset types within the state.

## 5.2 Identifying Options and Options Appraisal

As noted in section 4, the identification of drivers and options should largely come from stakeholders that have been contacted during the creation of the baseline.

In the case of the urban sub-sector, many of the engineering options that are available for increasing coverage, rehabilitating supplies or improving processes will already exist in some form of report or drawing. These can be used directly, but the assessors should also consider these in light of the baseline assessment to identify if there are any obvious alternatives or improvements that haven't already been considered. Costs may already be available for some of these specific options, and these can be updated for inflation and even adapted to use for other options that contain similar elements.

Demand management, including leakage control and metering is an option for increasing the amount of water available to consumers that are, or could be, attached to existing supply systems. However, information on the costs and benefits of demand management is likely to be very sparse. The currently level of unaccounted for water (UFW) is also likely to be extremely uncertain. It is therefore suggested that the level of demand management is driven by policy, rather than considering it as an 'option' as such. This effectively means that demand management (e.g. X% UFW with associated control measures) becomes part of the 'baseline' demand and demand forecast, rather than a water supply improvement 'option'.

Because of the large scope of the Master Plan it is important that 'generic' options are used where appropriate, and used well. This is particularly true for the rural and small town sub-sectors, where generic options should be used to evaluate the approach and potential costs associated with implementing new water supply schemes in those areas. The knowledge gained to date by RUWASSA and the WSSSRP should help to define the nature of these generic options.

In many cases, particularly in the 'sector wide' sub-sector, it will be very difficult to analyse the options to any great level of detail. The role of the Master Plan may therefore be to help set drivers and targets, and identify the studies that will be required to identify options for those targets and drivers, rather than to provide a robust, costed, options appraisal. Comments and stakeholder opinion on the approaches that can be used to address the drivers and needs should be included in the Master Plan. This is particularly important for drivers such as the improvement of the regulatory regime. This will require significant capacity building (either from the Federal level or international organisations) and development of regulatory guidance documents. Further information on regulation is given in previous PAWS reports and the Federal WIMAG document.

When evaluating the costs of options, a good approach is to try and use 'unit' costs, as discussed previously. Unit costs do not relate to bills of quantities or other detailed engineering cost tools. Rather they attempt to use knowledge of the 'typical' cost of whole items such as boreholes or unit quantities of items such as pipelines (i.e. cost per m of pipeline installed for various pipe diameters – including digging, pipe materials etc) to reduce the amount of time and effort required to cost options. Obviously this is less accurate on an individual basis for engineering schemes, but overall they provide an appropriate level of information on costs for a Master Plan.

Recurring capital costs (or 'capital maintenance') and 'reactive' maintenance can be difficult to predict, and are probably best approached through assessments of depreciation and 'asset lives', combined with broad assumptions. The key here is not to over-complicate. Have single, consistent asset lives for each asset type in each sub-sector and for 'reactive' maintenance assume a small percentage of civil and MEICA costs as maintenance each year (e.g. 0.5% civil/2.5% MEICA per annum).

For AIC assessment and other NPV analyses, a discount rate will need to be set. This could be difficult in the Nigerian context, but a reasonable starting point is usually the difference between the rate of inflation and the rate of interest being offered by banks.

### 5.3 Targets and Scenario Development

One of the key issues that is likely to occur for this initial Master Plan is that needs may be identified, but it is difficult to set the targets or options for those needs. In this case it is important to try and focus only on those needs and targets that can be realistically assessed in the Master Plan and are really important to the development of the water sector in the state. It is difficult to say in advance what these will be, but as a 'rule of thumb', any target where it is difficult to assess the baseline position against that target is probably going to be difficult to include in the Master Plan.

If the scope of the plan appears to be too wide in the timescales that are available, then it is suggested that drivers within the sector wide 'sub-sector' could be simplified so that it only includes regulation of private suppliers. The plan can then identify the need and benefits of improving regulation, improving institutional efficiency, etc and even reflect some assumptions of the impacts of these on costs/affordability, but make it clear that these need to be developed as part of a separate plan.

The other issue to remember when attempting to create a realistically simplified plan is not to attempt too many scenarios. In most cases a simple three point range of high, medium and low cost scenarios should be sufficient. The content of each scenario in terms of the targets it contains should be fairly obvious from the needs and draft policies that exist within the state and at the Federal level.

### 5.4 Investment Appraisal

In order to avoid too many iterations between the development of scenarios and the investment appraisal, it is sensible to initially look at potential income (tariffs, governmental funding and other investment potential) separately to the costs associated with scenarios. Broad assumptions can be used to estimate the impact of development on tariffs, etc, based on the relevant targets contained within the planning scenarios. Once the initial assessment of income potential and scenario costs has been carried out, then the affordability of the draft development scenarios should then be fairly obvious. The targets within the 'high', 'medium' and 'low' cost scenarios can then be adjusted so that the most likely levels of available income fall somewhere within those cost bands. Following that the timing of the targets can then be adjusted to bring the central estimate of costs in the medium scenario in line with the central estimate of income.



Once again it is important to re-iterate the fact that costs must include recurring costs, both in terms of operation and maintenance and 'capital' maintenance.

## 6 Conclusions

### 6.1 Conclusions

A potential framework for Master Planning in the water sector in Anambra has been presented within this report, along with some guidance notes on how to effectively simplify the Master Plan given the knowledge and time constraints that exist in this case. It is considered that the following key points need to be considered in order to produce a coherent plan in the time that is available:

- 1 A structured approach is needed in order to provide an adequate and meaningful plan. Two potential approaches have been presented, depending on the level of definition of policies and development targets that is in place at the start of the planning process. There are other approaches that could be used, but most will contain at least some of the elements presented in this report.
- 2 Baseline assessment needs to be based on existing information as far as possible. There are a number of very sensitised and knowledgeable stakeholders within the state that should be able to provide much of the information that is needed for the plan.
- 3 When assessing options, 'shortcuts', such as using 'generic' options, unit costs, and semi-qualitative analyses, should make the options identification and appraisal more achievable. 'Non monetised' issues such as difficulties in obtaining chemicals, reliable electricity, etc are a very important part of the options appraisal process and must be included.
- 4 When assessing targets for inclusion within the plan, try to avoid targets where progress will be difficult to monitor given the level of information that is available within the state. Where significant data or knowledge gaps exist, the plan should concentrate on the general approaches that are likely to be used to address the associated need/driver, along with the studies and initiatives required to address key knowledge gaps.
- 5 Some iteration will be required between scenario development and the investment appraisal. However, it is important to use rapid assessments, assumptions and 'ranges' in both the cost of scenarios and income that is available in order to avoid too many iterations and complication in the analysis.
7. When evaluating the cost of scenarios, ensure that both ongoing/recurrent costs are included as well as costs of investment in new infrastructure.

In terms of outputs, it is important that these include a prioritised list of schemes and initiatives in the order that they need to be implemented within the State. This provides guidance on priorities for development.

# Appendix A: Presentations Given to the Master Planning and Policy Workshop



## An Introduction to Master Planning in the Water Sector

Workshop presentation:  
Gabriel Ekanem  
Dr Douglas Hunt



## Introduction

- Will explain what master planning is
- Will show the process of master planning
- Will discuss links with investment



## ‘Master Plans’

- What is a Master Plan?
  - High level, strategic document that:
    - Directs development over a number of years (often 5, 10)
    - Gives a ‘birds eye’ view of costs and activities in the whole sector
- All large, well run, infrastructure organisations have some form of ‘Master Plan’



## What Do They Do?

- Answer 5 simple questions (Strategic Development Plan):
  - Where are we now?
  - What resources do we have?
  - Where do we want to be?
  - How could we get there?
  - How should we get there?
- 6<sup>th</sup> question (Sector Investment Plan):
  - How do we pay for it?

## Why Do It?

- Why do we need to plan?
- What are the advantages?




### Stage 1: Baseline

**Baseline Assessment Phase: Data Gathering**

Obtain data from stakeholders where possible: MPUWRCD, ASCW, MEPD, RUWASSA, LGAs etc

Gap analysis and collection of primary data, where absolutely necessary

### Stage 1: Collect Baseline

- **Current water supply situation**
  - Physical infrastructure (boreholes, supply schemes, community schemes etc)
  - Population and potential demand attached to existing schemes/boreholes (working or not)
  - Population served and types of private supply
  - Location and nature of identified or perceived water quality issues
- 'Check reliability and compare data sources!'

### Stage 1: Collect Baseline

- **Potential resources (quantity and quality)**
  - Water: Groundwater, springs, rivers
  - Human: Private sector capability, unused institutional capacity
- **Key constraints:**
  - Physical (erosion/flooding, areas of high development/pollution, topography etc)
  - Soft/institutional (key capacity constraints, adverse development policies etc)

### Stage 2: Identify 'Drivers'

- **'Drivers' are based on needs that exist in the state, e.g.**
  - Need for volumes of water
  - Need for clean water
  - Need for reliability of water supplies
  - Need to reduce the cost of water
  - Need for better regulation/management of private and public suppliers
- **Categorise needs into 'drivers', e.g.:**
  - Maintain 'performance' of existing supplies ('interventions')
  - Improve coverage
  - Improve reliability
  - Improve water quality
  - Improve efficiency
  - Implement/improve regulation

### Stage 2: Identify Options

- **'Options': Schemes and activities that can address needs:**
  - **'Conventional' physical works:**
    - new engineering schemes, community boreholes, refurbishments, pipelines etc
  - **Other physical activities:**
    - E.g. Demand management, improving traditional sources (helps water quality), improving security at existing works
  - **'Soft' developments:**
    - E.g. Set up regulators, carry out studies (address knowledge gaps), IT, knowledge management etc
- Can be 'specific' (larger schemes/initiatives), or 'generic' (community schemes, general initiatives)
- **USE LOCAL KNOWLEDGE TO IDENTIFY AND GROUP OPTIONS**

### Stage 3: Set Targets

- Targets defined for each driver
- Targets vary by area (LGA, town/city etc)
- Need to decide on how areas will be set for each Driver
- Should link to Policy, e.g.:
  - Targets for RUWASSA scheme coverage may be higher in LGAs with greater need
  - Targets for quality compliance among private sellers set according to Policy.
- **TARGETS NEED TO BE BASED ON OUTPUTS, NOT INPUTS!!**

### Stage 3: Select Options

Select options to implement for each driver, in each area

*E.g. Coverage*

Prioritise options based on screening and cost/benefit

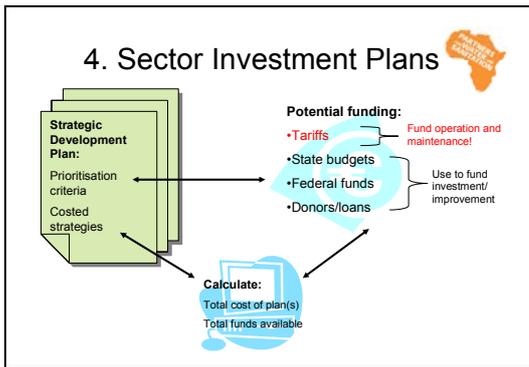
Number of people served by treated water

Baseline coverage increases as each scheme is implemented

'target' is number of people supplied

### Stage 3: Produce Plan(s)

- The Plan is simply:
  1. The selected options that meet the targets for each driver
  2. The cost of operating and maintaining supplies and institutions
  3. The cost of building new works in each year
  4. The costs of implementing initiatives/other 'soft' schemes in each year
- Can have a number of 'scenarios'



### 4. Sector Investment Plans

- Key questions:
  - Does our strategy affect accessibility to funding (policy conflicts)?
  - Can we afford the preferred plan?
    - Risks
    - Uncertain/hidden costs
  - Can we increase funding/reduce costs?
  - If not, can we use an alternative scenario (cut targets)?

### Conclusions

- Structured approach that:
  1. Gathers all existing data in a suitable structure
  2. Identifies needs and potential ways to meet them
  3. Sets targets to meet those needs
  4. Objectively identifies best strategy
  5. Checks affordability of the strategy & targets

## Policy Development

### Overview

- What is a policy?
 

'A plan or course of action, as of a government, political party, or business, intended to influence and determine decisions, actions, and other matters'
- What should it do (key attributes)?
  - Define roles and responsibilities
  - Define relationships and institutional arrangements within the sector
  - Set targets and aims, including recipients (e.g. pro-poor policies)
  - Harmonise existing legislation and policies (Federal and State)
  - Define mechanisms for funding and financial sustainability
  - Indicate appropriate methods for delivery of development

### Overview of National Policy

- Sets policy objectives, e.g.:
  - Sets basic standards (in PCC terms) for urban, semi-urban and rural consumers
- Gives strategy 'statements'
- Guiding principles on reform and sector structure are:
  - **'Water is an economic good'** – demand is a function of price, willingness to pay is a function of service. Enhances financial viability by ensuring cost recovery
  - **'Equity and poverty alleviation'** – aim to provide WSS in an equitable manner, e.g. through targeted subsidies

### Overview of National Policy

- **'Autonomy of Service Providers'** – promote operation along commercial lines. Regulate, but allow autonomy in managerial, financial, technical functions
- **Management at the lowest appropriate level'** – (e.g. WCAs); enhances sense of ownership and potential for cost recovery. Note appropriate (i.e. still water corporations for urban areas)
- **'Participation'** Involve communities, private sector etc (improves finance, technical capacity, transparency, efficiency etc)
- **'Policy Making and Regulatory Role for Government'** – links to autonomy of service providers; ministries co-ordinate, enable and regulate. Parastatals, communities and private sector deliver and manage supplies. A single ministry is in overall charge of WSS in the state.

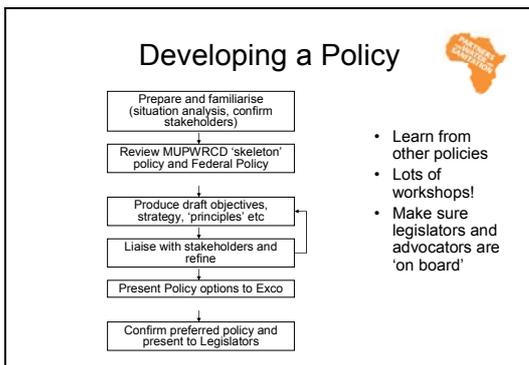
### Overview of National Policy

- Clear policy statements on:
  - Operating agencies and institutional responsibilities
  - Funding (including new capital, operation and maintenance and capital replacement)
    - Federal counterpart funding
    - State counterpart funding
    - LGA and community counterpart funding

### National Policy Sector Funding

Sub Sector	Urban	Semi-Urban	Rural
Type of cost			
New schemes	30% Federal 60% State 10% LGAs	50% Federal 30% State 15% LGA 5% community	50% Federal 25% State 20% LGA 5% community
Recurring capital	Complex, but mainly tariffs (some subsidy on domestic side)	Some tariff input from commercial consumers, rest is State subsidy	100% State
Operation & maintenance	100% tariff	100% community (tariff or other)	10% state 20% LGA 70% community

- ### Developing a Policy
- Example policy format:
    1. Statement of current situation (incl. need)
    2. Policy objectives (incl. guiding/fundamental principles, targets etc?)
    3. Policy strategies to achieve objectives (aka 'key components' etc)
    4. Policy statements (institutional structures, funding mechanisms, inter-agency relationships, licensing etc)



- ### Key Issues
- **LACK OF CLARITY OF OBJECTIVES**
    - Can we base a Master Plan on them?
    - Are they detailed enough to allow assessments of affordability and deliverability
  - **ROLES AND RESPONSIBILITIES**
    - Who owns what?
    - Who sets tariffs, applies for Federal funding, provides project plans for securing Federal funding?
    - Who procures/delivers new and refurbished schemes?
    - Who is responsible for M&E, technical support (relationships between institutions)?
    - Human Resources?
    - What about the private sector?

- ### Key Issues
- **Regulation and Performance**
    - How can you stop ASWC failing again?
    - How can you engage with private sector?
    - Need strong, effective regulation
  - **Financial management and funding**
    - Are all forms of expenditure covered?
    - How do strategic plans fit with the annual budgeting process?
    - How are budgets channelled and used?
    - How are donor agency funds to be channelled & handled?
  - Policy can refer to supporting guidelines or regulations to provide details

## Workshop Sessions

- ### Master Plan Workshop
- What difference would a Master Plan make in Anambra State?
    - o Large difference – why?
    - o Little difference – what are the barriers?
  - Is there capacity in the State to deliver a sector wide policy and Master Plan?
  - How often should the plan be updated?
  - How do you know if a plan is affordable?
    - Think about all sources of funding and all costs

- ### Policy Workshop
- Who are the key stakeholders for delivering Water Supply and Sanitation Sector policy in Anambra?
  - What do you think of the Federal Water Supply & Sanitation Policy's guiding principles?
  - What roles need to be defined by the policy?
  - Which roles are most important?
  - What would Anambarians like to see in their policy?
  - What should the policy on the private sector participation be in Anambra State?
  - Any other Suggestions?????

## Appendix B: Selected Workshop Pictures



***Cross Section of Workshop Participants***



***L-R: PAWS Lead Partner (Dr. Douglas Hunt), The Perm.Sec. MPUWRRD, The Head of Service, and Member House Committee on Public Utilities***



***Cross Section of Workshop Group 1 on Policy issues, chaired by the Chairperson House Committee on Public Utilities***



***Cross Section of Workshop Group 2 on Master Plan issues, chaired by the Perm. Sec. MPUWRRD***