



# ripples of water

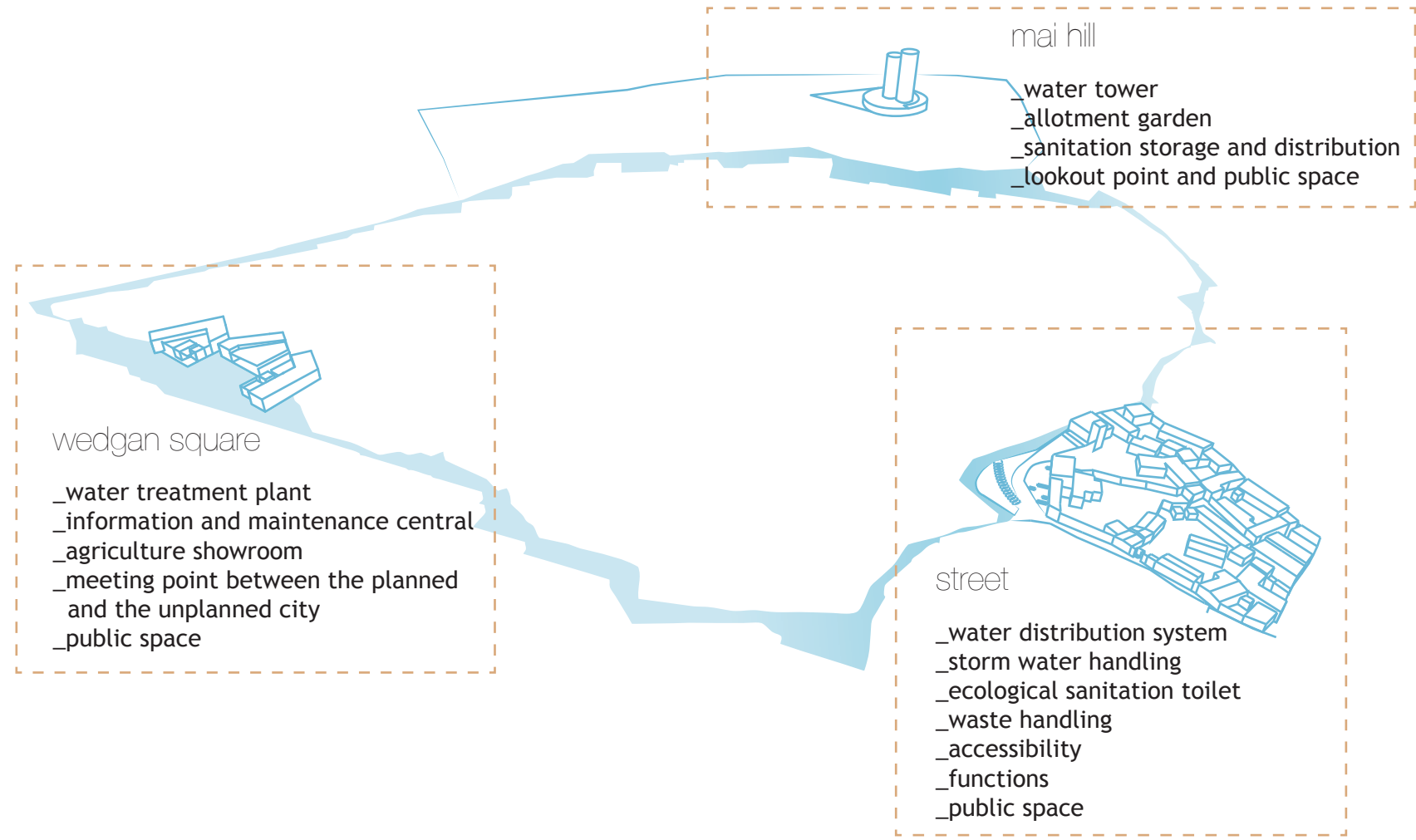
- upgrading the informal settlement Aba Shawl



Aba Shawl is the indigenous part of Asmara, possessing/holding the genuine identity of the town. Few measures have been taken to upgrade it, and big challenges burden the area.

This project proposes a possible strategy for the future development, focusing on improving the daily life of the residents. Our strategy aims to keep and strengthen the qualities found in the area, concurrently with giving an answer to its challenges. We encourage a sustainable approach to the different measures needed, and hope to present an inspiring attitude towards upgrading.

Water is a human right, and affects our life in every way. We have looked at the ripple effects created by implementing water, and zoomed in on three strategic points:



Aba Shawl is an informal settlement in Asmara. The winding streets and small houses make it a unique area in the city. The atmosphere is strong and lively and you do not have to walk far to meet children playing or mothers doing their laundry in the streets. The poverty in the area is impossible to ignore, but the clearly visible social network and big smiles overshadow the poor living conditions and makes the area vibrant and fascinating.

Aba Shawl is also an important part of the history of Asmara. The area can be found on maps dating back to 1906 and you can find families that have been living in the area for more than 130 years. The street network is left almost untouched in all these years, making it a living remembrance of past times.

The settlement is located just to the north of Afabet Street, which marks the limit of the historic perimeter of the city. During the Italian colonisation, Aba Shawl was part of what was called the indigenous zone. The city was strongly segregated and this northern part was designated to the Eritreans. In contrast to other parts of the city this part was left unplanned and neglected.

Some parts of the northern area of Asmara received a strict plan to develop into industrial purposes in 1908. This controlled the further development of the area and has pushed the borders of the planned city straight into the unplanned city, leaving a clear border between the two. Aba Shawl is situated in a hillside, and the rigid pattern of the city plan did not suite this uneven topography, leaving this area untouched.

The Italian planned city received a regular pattern in the North-South direction. Before the Italians were overthrown during the Second World War, the European areas of Asmara were provided with water supply, sewage disposal, broad paved streets and health care. Aba Shawl still has none of these. With no urban planning or provision of services, it evolved in a different way than the rest of the city. No formal street plan or infrastructure existed to ensure sufficient health-care, education, communication or sanitary facilities for the inhabitants. There is still no running water in the houses and the electrical distribution network has only been improvised by the inhabitants, leaving it an unstable and dangerous system.

The small houses have been arranged without any strict underlying regulation or planning. However, some sort of arrangement between the inhabitants must have existed. There is a structure based on blocks and shared backyards that can only have been build up through some sort of common understanding. The houses have been gradually maintained or rebuilt and kept in good condition by their owners.

Aba Shawl is still Asmara's poorest area and has been neglected by the following administrations until the independence of Eritrea. However, the fact that these native quarters still exist together with the Italian planned city gives the city its unique identity.

Asmara is understandably a city keen on developing. Poverty is still a big problem and a major part of the city's population lack basic infrastructure and proper facilities. It is important to have this in mind, and be realistic when making the priorities of the future urban planning of Asmara and Aba Shawl. Eritrea has the chance to learn from other countries where irresponsible planning has taken place, with decisions not properly thought through. It is said that the best way of creating wealth, is by developing human settlements in a sustainable way. This can be an important aspect in the future development of Asmara.

#### inhabitants

The density in the area is 1 100 to 1 500 persons per hectare, which is the highest population density in Asmara. The area we are looking at is about 10 hectares, which means that there is in-between 11 000 and 15 000 inhabitants.

Women generally have the role as homemaker and child-taker. They make the food, collect fuel necessary for its preparation, in addition to sweeping and caring for the home and providing primary healthcare for family members who fall sick. They are also responsible for collecting water. Large parts of the male population are in national service. This means that a high amount of the households are run by women on a daily basis and the street life mainly consists of women, children and elder men. A system of shared backyards provide strong social networks and the responsibility of looking after the children is often shared between the neighbors.

Aba Shawl is mainly a Muslim area, but has also some Christians.

#### functions

You find the highest concentration of shops in the outskirts of the area. Within Aba Shawl, the density is high and there is little space left for such functions. It is mainly a residential area, with little economical activity. There are a few shops and beauty salons in the south-western part close to Wedgan Square. These shops have the public function towards the street, while the private home is placed at the back.

#### meeting between planned and unplanned

Aba Shawl lies in the meeting between the planned Italian city and the unplanned. A strict regular pattern in triangles meets the informal city with its irregular contour and small and winding streets.

#### structure

Aba Shawl consists of an intricate system of small houses. Each family have their own house or a small room. One family often have as much as seven members, and often up to ten families can share the same backyard. Others have been able to upgrade their house and now have a private backyard. The social structure of the semi-private backyard is very important to the inhabitants. There is a high degree of interaction with your neighbours. They share responsibilities and the safety such arrangements provide are important aspects to keep. A rough count suggests that the area we have selected in Aba Shawl consists of about 420 backyards.

The houses often have one facade facing the street. They lie in an irregular pattern and the fences are used as a mediator between them, making a continuous street. The backyards are structured together into blocks with a system of main streets and side streets. The chaos has its own order.

#### housing standard

The buildings in Aba Shawl are one storey high and made of mud, stone or occasionally brick. You can still find examples of the traditional housing typology of the hidmo and the round agdo, where especially the agdo influences the shape of the street. High fences surround the backyards, keeping this semi-private zone out of sight for any by-passers, however the doorway is usually kept open and gives you a quick glimpse of the daily life inside.

Aba Shawl is in constant change and development. As families evolve through generations, they slowly upgrade their homes, piece by piece. Others get a higher income level and can even build new homes with a quite high standard. This is clearly visible in the streets of Aba Shawl. Suddenly new facades face the street and even the cover of the street is upgraded.

#### ownership arrangements

The inhabitants of Aba Shawl own their own properties and the houses built on them. This means that there is a legal obligation to compensate for any impacts the new formal interventions will have on their private properties. Families that are forced to move, have to get compensation for their loss and given the feeling that they are given back something of a greater value than what they had.



#### identity

The streets of Aba Shawl are winding and narrow, always changing and giving new spatial experiences. Every street is unique with every wall built in different ways of brick, stone or mud. The walls follow old borderlines and the topography of the terrain and are a remembrance of old times. It is a part of the area's history. In addition there is a mix of new houses with satellite dishes and the traditional typology of the agdo and hidmo. It is like walking in both the past and the present at the same time. The palette of materials has a natural rhythm of earth colours, often with a door or a window in a contrasting shade of blue. It is also the contrast to the Italian planned city that makes Aba Shawl unique and in this way an important part of Asmara. It is a part of its identity and history.

#### step by step development

The houses in Aba Shawl are in constant change. Some places new facades face the street and even the cover of the street is upgraded. This upgrade has happened without conflicting with the existing street network and shows that it is possible to get a better living standard step by step without going through with a "tabula rasa" project.

#### social network

The social structure of Aba Shawl is so complex for us to fully understand, but that the social relations are strong is clear. The social aspects of the shared backyard seem to be very important to the women and children living there. Often, they share the responsibility of looking after the children and can even have a common kitchen. It gives a sense of security, in addition to strong social relations. They depend on each other in their daily life. One should interfere with these social structures as little as possible. It is of great interest for the inhabitants to keep this network, and moving people by force is to remove them from their safe social environment.

#### water

Today, water is distributed from trucks. They leave big barrels at distribution points where it is collected by the inhabitants. They use small tanks that they can carry on their backs. This is very time consuming and hard work. They have to take about 10 to 15 trips to fill the barrel in their own backyard. A few backyards have a pump system for water, but this system is not reliable and gives no solution for grey water. There also exist a few public tap stations. Some families have as little as 5 to 10 litres per capita per day. There is a big risk of the water getting contaminated when it is left in open barrels. Grey water is usually thrown out into the streets.

#### accessibility

Narrow and winding streets make it almost impossible for a car to enter the area. Some places streets are only one meter broad, and in addition, the rainwater has washed away much of the ground cover and made the surface rough and uneven. This makes it a challenge for even bikes to get around.

The poor accessibility makes it difficult to get things in and out of the area, such as waste, goods and ambulances. The fire safety is also very bad.

#### sanitation

Public sanitary stations provide toilets and showers. Most of the stations are more than 25 years old and in bad condition. A fee has to be paid to use the facilities and the stations provide jobs for the inhabitants. A few backyards close to access roads have private toilets. These are connected to a septic tank or the sewage system. The ones having a septic tank rely on big trucks for collecting the waste.

#### density

The density in Aba Shawl is very high. 1100 to 1500 persons per hectare in one-storey high buildings give high numbers. Often, a room of 3 meters x 3 meters is shared by a family of 7 persons. In addition, the population in Asmara is expected to double within the next 20 years.

#### surface water

Heavy rains in July and August wash the streets bare of gravel and dirt. It erodes the street cover, leaving it difficult to use a bike or even walk.

#### lack of functions

Today, there is a lack of public functions in the area. Aba Shawl is mostly a residential area and there is little space left for other functions. But there is a big need for this, especially schools, kindergartens and health stations.

#### lack of public space

Some places the narrow streets widen up and create small open spaces. These spaces have no sort of urban development, but often there is a public function placed in connection to it.

#### economy

Aba Shawl is the poorest area in Asmara. Most men are working in national service, while the women are caretakers in the household and usually do not work. More functions that can provide jobs for the inhabitants are necessary.







## approach

Something must be done to increase the living conditions for the inhabitants of Aba Shawl. In cooperation with the Department of Infrastructure in Asmara, we have discussed three possible strategies for how this can be done.

### 3 possible strategies

#### 1\_demolishing and rebuilding

- \_accessibility: The area will be fully accessible. Public spaces and functions can be planned and this is a basis for economic growth.
- \_identity and history: will be lost.
- \_social structure: people will be forced to move, at least for some time. Much of the social structure will be lost and the impact on the inhabitants is high.
- \_ownership arrangements: the inhabitants own their own houses and have legal rights in this process. It will be almost impossible to ensure that everyone's rights are preserved/maintained. The strategy does not take into consideration that not everyone will have the financial ability to rebuild their house at the same time.
- \_sustainable development: this strategy is not consistent with a sustainable development.

#### 2\_adding a few access roads

- \_accessibility: The accessibility will be better. Public spaces and more functions and services can be added and be a basis for economic growth. The strategy is more robust for a future development of Aba Shawl, and will also network the unplanned city into the rest of the city. The degree of accessibility and impact is dependent on how broad the new streets are.
- \_identity and history: Some of the history and identity will be lost. Depending on how close these access streets are added there will be a conflict in how the existing street network and the new streets meet.
- \_social structure: this strategy will have a big impact on some of the inhabitants since they most likely will have to move. This will remove them from their safe social network.
- \_ownership arrangements: some of the inhabitants will have to move and get some sort of compensation. It will most likely not be possible to replace everyone within the immediate distance of Aba Shawl. This has an impact on the distance to the rest of the city and their workplace.
- \_sustainable development: this strategy is more consistent with a sustainable development.

#### 3\_keeping the existing street network

- \_accessibility: the only upgrading of the accessibility will be to change the street cover. This will make it easier for people to walk or use bikes or trolleys. It might also be possible to use other means of transportation to access the area. Studying the existing structure one can find open plots that can be suitable for new functions and public spaces.
- \_identity and history: this will keep the street network and historical base of Aba Shawl untouched. This is valuable, as Aba Shawl is a part of what makes Asmara unique, both in structure and in a historical setting.
- \_social structure: this strategy does not conflict with the existing social structure.
- \_ownership arrangements: this strategy does not conflict with the existing plot structure. It leaves the possibility of letting the inhabitants gradually upgrade their homes and in a natural process increase the living conditions.
- \_sustainable development: this strategy is more consistent with a sustainable development. Planning a development based on existing qualities will also make it more robust for future influential forces.

#### conclusion

\_Strategy 01 points out as the one with the most negative consequences. It has a big impact on the inhabitants and the existing street network as possible, but we also want to increase the accessibility in the area. We take it as a starting point that other means of transportation can solve a part of the problem, as it does in many old medieval towns, such as San Gimignano in Italy or Gamla Stan in Stockholm, Sweden. Some houses must probably be moved, but the degree of impact on the inhabitants can be kept to a minimum.

It will also be possible to add a water distribution network in the existing streets, which will increase the living conditions for the inhabitants. Getting a better housing standard can happen gradually, especially if one facilitates a development where the inhabitants will create and get more resources.

## how?

Measures must be taken to increase the standard of living in Aba Shawl and to give the inhabitants an easier daily life. We wish to do this without destroying the quality, identity and history of the area.

How can we take advantage of the measures taken and get even bigger ripple effects than the actual intervention?

#### water

Access to safe water and sanitation is acknowledged as a fundamental human right (UN - 2002). It is not a luxury, but a basic requirement in the everyday life. Securing a constant and sustainable water supply is also a starting point for triggering development. Water is the life nerve in any society (and the issue of water cannot be taken lightly).

In Asmara, the shortage of water is a challenge. Today, the city is entirely depending on surface water from three existing dam reservoirs. The distribution network does not work continuously over the week, and in some areas people rely on water trucks once a week. Water then has to be stored in tanks until the next supply of water appears.

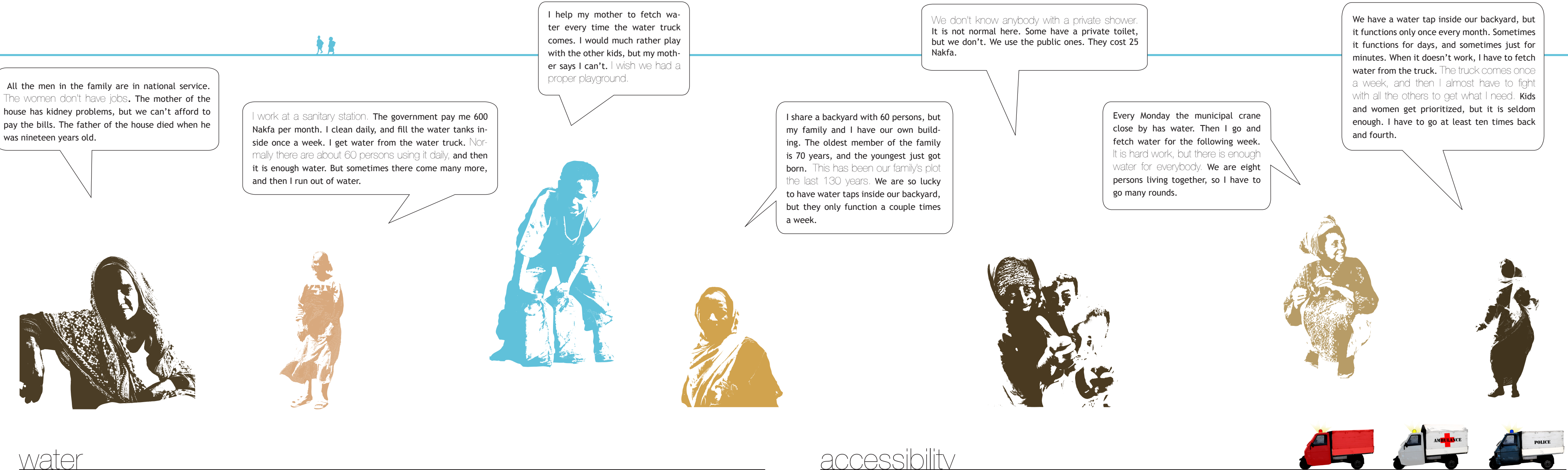
Creating a stabile and sustainable water supply is therefore crucial for the future development of Asmara. Also, the population of Asmara is expected to grow and so will the demand of certain resources. In order to prevent shortage, the waste produced needs to be reintegrated back into the system, creating a circuit.

#### ripple effects

The technical intervention required for installing a water distribution system and sewage can have big ripple effects. Adding pipes in the streets gives the possibility to at the same time upgrade the street cover and public spaces. This will increase the accessibility, which again has extended effects.

By adding a wastewater handling system, a wastewater plant, the water can be used twice. This water can then be used for agricultural or industrial purposes. If used for some type of farming, it will be a valuable contribution for the inhabitants. Also the possibility of rainwater harvesting would transform a hazard into an asset.

Organic waste is possible to recycle. By using an ecological sanitation system it can become an important contributor to agricultural purposes as fertilizer and soil.



## water

The water sources are unstable and the collection of water is time consuming. When having to store the water in barrels there is also a risk of contamination.



#### RECYCLING

Water can be divided into three categories:

- \_clean water need access to a water source
- \_grey water contains food waste, soap leftovers and such possible to recycle
- \_black water water from flush toilet difficult to recycle

By removing the black water from the sewage, it is possible to recycle and reuse the water from the household. This grey water can go through a wastewater treatment plant and be reused for watering plants and vegetables, washing and industrial purposes.

With this solution, the black water needs to be handled by a different system. If one uses a system based on ecological sanitation, this waste can also become a valuable resource as soil and fertilizer.

These are sustainable solutions and they create resources that today are in short supply.

#### DISTRIBUTION

To add a water distribution and sewage system it is necessary to find existing streets with good slope conditions for transporting grey water. They must also provide an as high coverage for inlaid water as possible. The grey water needs a minimum slope of 1 % to avoid sedimentation. Pumps must be installed where slope conditions are not good enough.

Where it is not possible to get water into the houses, tap stations will be provided at strategic points. These can also function as the main distribution system in a transition period before water is installed in the backyards.

#### WATER TOWER

The topology on the site can be used as a means for transporting water. By taking advantage of the fact that Aba Shawl is situated around a hilltop, gravitation can give the pressure necessary to get running water in the streets and houses of Aba Shawl. Gravitation provides long-term and consistent water management, and are systems that need little maintenance compared to pump-systems.

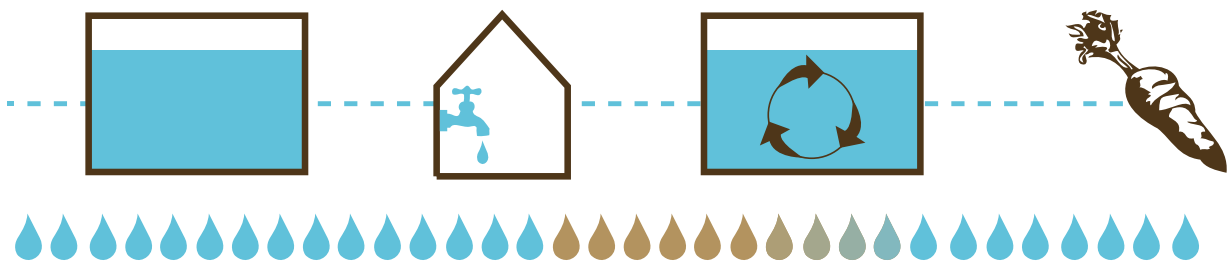
By adding a water tower at the hilltop, we get a system based on gravitation. In addition, by adding a safety factor to the size of the tank, we can obtain a constant water pressure even when the rest of the city does not have water. A pump-system is necessary to get water from the existing water network in the city and up to the hilltop.

#### WASTEWATER TREATMENT PLANT

The natural slope conditions also decide where the water ends up. A water treatment plant has to be placed at the bottom of the hillside to take advantage of the gravitation. We have chosen to look at Wedgan Square as a possible site for the treatment plant. The cleansed water will be reused at the hilltop for agricultural purposes in the allotment gardens and in backyards. In this way it gives a direct contribution back to the inhabitants and the circuit is complete. Surplus of water can be sold to the rest of the city to keep it green or to farmland in the outskirts of Asmara. In this way it also can become a source of income for the community of Aba Shawl.

#### measures

- \_water distribution system
- \_water tower
- \_water treatment plant

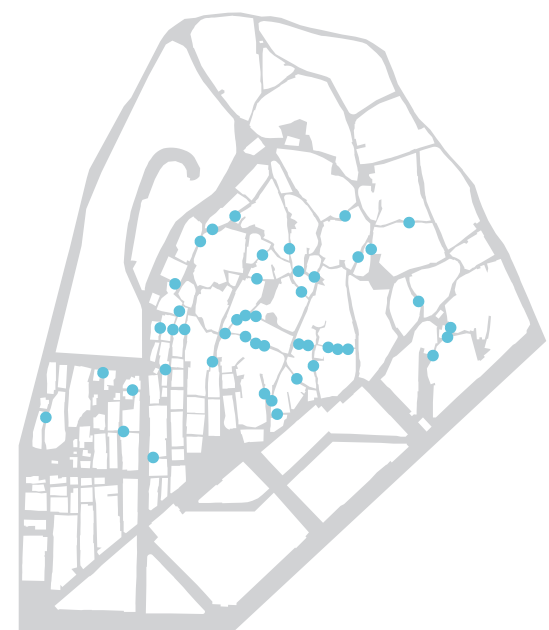


## accessibility

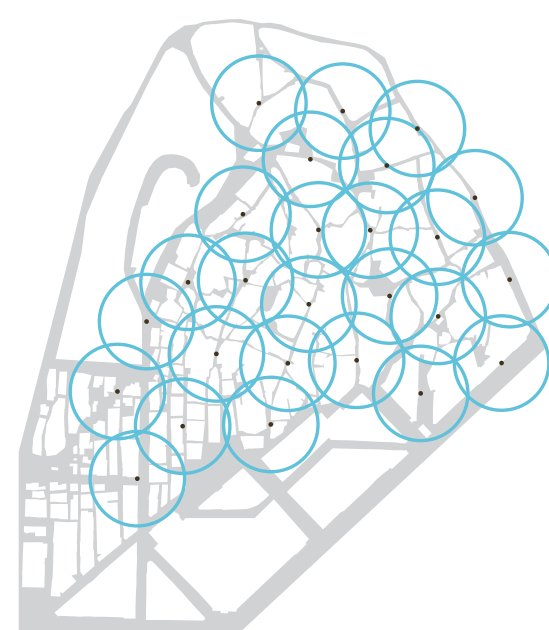
It is absolutely essential with some kind of upgrade of the street network to improve the everyday life of the inhabitants in Aba Shawl. This will solve problems concerning transporting things in and out of the area, such as waste and goods. Improving accessibility also leads to the development of new services, which again will give economical growth.

The two main issues concerning the accessibility are the cover and the width of the streets. The cover of the streets can be upgraded at the same time as pipes for the water distribution system is added in the streets. In Asmara, granite cobblestones is a cheap and sustainable solution. This upgrade also increases the esthetical qualities of Aba Shawl.

The streets width varies from one meter and up to ten meter. The broadest streets run in the outskirts of the area, while the narrowest often run in the east-west direction. Most streets are about two meters wide. A challenge is that the width of the streets varies a lot within the same street, leaving very few streets accessible in their full length. Giving a normal car access to the area is therefore unrealistic, as this would mean many and large operations. However, the new service systems of Aba Shawl require that a car or cart can access the backyards to collect the trash and toilet waste. This means that these vehicles must be of a smaller size than the normal car. When we visited Asmara, we observed many three wheeled Piaggios with a width between 1,20 meters and 1,50 meters. These would function very well in Aba Shawl. We have therefore based our waste-systems on the 1,50 meters wide Piaggio, and looked at where the streets width must be changed in order to fit it. Some places a fence or a wall will have to be moved or torn down to give room to the street. If the impact is big, this can be compensated with a new house at a different location. Another solution is to upgrade the existing house to a better living standard. Two storey high buildings can also be introduced. If the impact only affects the size of the backyard a



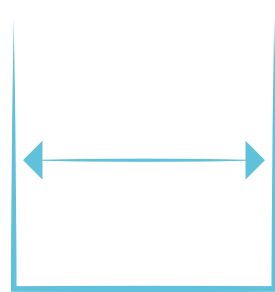
Map\_streets narrower than 1,50 meters



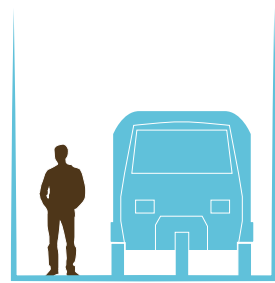
Map\_suggested fire hydrants

#### measures

- \_upgrading street cover
- \_making the street section broader in problem areas
- \_adding fire hydrants



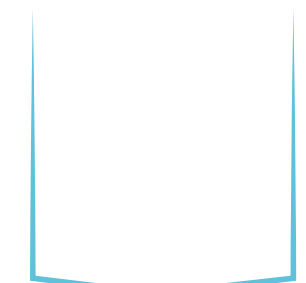
Challenge today \_narrow streets



Solution accessibility\_small service cars



Challenge today\_rugged street cover



Solution stormwater\_street groove



Map\_new bus loop



ripple effects



## measures

realism

Aba Shawl is in the big context a very small part of Asmara. Areas north of Aba Shawl have many of the similar features, and people live under difficult circumstances. The difference is that they are organized in big straight blocks, and often have inlaid water. But the standard is low, and these areas are also in need of an upgrade. Our project aims to give transferrable solutions that can be implemented in these areas as well, but some measures are of course site specific.

As Eritrea is a poor country, we have focused on making robust strategies and designs. In order to be a serious contribution, this is necessary. Economy, technology, and materials available are issues that have affected our choices, as well as the will to exploit the local knowledge. Keeping the balance between this and making inspiring and innovative projects is both challenging and exciting.

To achieve these goals we have worked with different levels of feasibility in the different projects. We have emphasized the need for low-tech solutions in our technical proposals, and collaborated with professionals to make sure that our answers are realistic. In the parts meant as inspiration, we aim to suggest principles they would want to follow. To illustrate those principles we have proposed a building design for each of the different parts. The principles are however more important than the design. It is more about what a building does, than what it is.

### STREET UPGRADE

The most significant upgrade for the inhabitants is in the street tissue and the backyards, which is why we have focused on solving these challenges with realistic and technical solutions. We have chosen a typical street in order to exemplify the specific measures and their impact on the residents' daily life. The solutions we present are transferrable to the rest of Aba Shawl and similar areas in Asmara.

### WEDGAN SQUARE

The implementation of a new water and sanitary system requires information, maintenance and a consistent supervision. We have developed a strategy for establishing this new system and how to run it properly, resulting in an operation central and water treatment plant on Wedgan square. The square holds a strategic location, as it is connected to the planned city.

### MAI HILL

Mai hill is the symbol of the new Aba Shawl, with its three water towers and green covered grounds. The inhabitants' allotment gardens surrounds the top, with a public vein stretching itself through the area and up to the highest point.

## sanitation

When the black water is not to be mixed with the grey water, a different system is necessary to introduce.

With flush toilets, another set of pipes would have to be laid in the streets and a lot of water needs to be added to get rid of the waste. This method will therefore use more resources than it creates benefits. Water-born collection systems are also a major component of water pollution.

An ecological sanitation system is based on an ecosystem approach and treats human waste as a valuable resource to be recycled. It is a sustainable solution in addition to being an affordable system that easily can be installed and maintained. A positive feature is that this system functions without water.

Sanitizing and recycling human waste creates a circuit and important resources, especially in areas where soil fertility is as low as it is in Aba Shawl. It can be used for agricultural purpose, which can be of great benefit for the inhabitants there, both when it comes to health issues and economy.

For this system to function in such a large scale, a service system needs to be established. The waste will have to be collected by service workers and then stored at a storage space at the hilltop before it is taken into use in the allotment gardens or in the backyards. Surplus of soil and fertilizer can be sold to the farmland in the outskirts of Asmara.

To ensure that the system is functioning properly, it is necessary with educational facilities and a showroom for how to take advantage of the new resources provided in the best possible way. These services are placed at Wedgan Square and take part in a public space in connection to the rest of the city.

**PRIVATE UPGRADE**

We are proposing a strategy where every backyard gets its own toilet based on the system of ecological sanitation. But this means that we are interfering with the arrangements of the private household and are implementing systems that have to be solved within every backyard. Upgrading the backyards is a sensitive theme, as it must happen on the residents' premises. The residents will have to want the changes, and fully understand it, in order for it to function. Forcing rules upon them, is not an approach we desire, but with the upgrade some regulations still follow. If you choose to build an ecological sanitation toilet for example, you can't send the waste in the pipe system. Choosing what material you build the toilet in, is however free for the inhabitants to decide.

Sanitary stations are still provided for those who do not have the possibility of adding this system to their household. The existing stations are kept as long as necessary and possible. These stations also provide showers.

**measures**

- \_principle solution for ecological sanitation
- \_allotment gardens
- \_storage
- \_sanitary station
- \_maintenance system

Existing sanitary stations that should be kept as long as it is a need for it

Every backyard gets a toilet to share

## surface water

The rainwater is more of a hazard than a resource; it floods the streets and washes away the street cover. If collected and handled properly it can be of great value, especially when water resources are scarce.

An important part of solving the problems concerning rainwater is to make room for it in the street section. A water groove is placed in the middle of the street and the two sides of the street receive a small tilt of 1 - 2 % to lead the water into the groove. The groove is placed in the middle of the street to avoid the water eroding on the walls and fences along it.

The surface water from the streets is too polluted to be used directly by the households or for agricultural purposes and it is not sustainable to dimension the wastewater treatment plant to handle the rainwater when it only occurs a few weeks a year. The

water is lead into infiltration basins where it has the time and space to infiltrate into the ground. (More information about infiltration basins is found on "Edaga Hamus, Public space")

Solving the storm water issue inside each backyard is an important part of minimizing the problems it creates in the streets. If each backyard handles as much as possible of the rain falling on their property, less water will flood the streets. Rainwater harvesting is a cheap and easy method to help this problem. The roofs in Aba Shawl are

made of corrugated plates, often slightly tilted, which make a good starting point for harvesting the rainwater. The barrels previously used for storing drinking water can easily be placed under the roof and used for harvesting rainwater. The water can later be used for watering plants and vegetation in the backyard.

**measures**

- \_water groove in the streets
- \_purposed regulation of rain water harvesting in the backyards

## lack of public space

The open spaces within the city tissue of Aba Shawl have no type of urban character, but have a great potential in becoming informal meeting places for the inhabitants, giving them the possibility of socialising outside their private home. Often there is a public function placed in connection to these open spaces, and this would be a desirable principle to follow. When mapping the structure of Aba Shawl to find the space for new functions, one should try to connect these functions to existing open spaces. By upgrading these spaces and facilitate for activities to take place, one invites people to spend time there. This will in turn promote economic activity and safety.

Upgrading such public spaces will also increase the esthetical value of the area. The spaces are already unique and have an individual character because of the ever-

changing street network. These qualities should be reinforced and a focus on the human scale should be maintained.

Map to the right shows where there are small or open spaces that with an upgrade can become recreational spots.

**measures**

- \_upgrade of public space within the street network

## density

The houses and backyards in Aba Shawl are in constant change as families grow, new generations take over and people move. But since the population of Asmara is expected to double within the next 20 years, some sort of regulation must be made if the area is not to become even denser. The natural step-by-step development in the area today can be used to regulate a process where the goal is to end up with less people sharing one backyard. This regulation can state rules for a more efficient area use and by starting to build two-storey high buildings. Solving density through a vertical growth can be an effective measure.

How these regulations should be carried out is not something we feel qualified for solving. We are only stating that some sort of regulation controlling the future development is necessary, not only to control the density, but also to make sure that the qualities and identity of Aba Shawl is not lost.

We have used one typical block and backyard as a case study of the structure and area use in Aba Shawl. In the selected backyard the density is 0,09 persons per square meter.

The Dol has developed a low cost housing standard to be used in such dense neighbourhoods. This is a one family house with private backyard and has a total area use of 70 sqm. If one assumes that one family consists of six persons, you will get the same density as in the backyard we have looked into. The low cost housing also has the second largest percent of built up area compared with all the backyards in our selected block. Directly translated this means that it is possible to achieve the same building standard within the existing network of Aba Shawl, but less strict rules for housing typologies might be necessary. The suggested low cost housing also does not take into consideration the existing social networks of the shared backyard.

**AREA CALCULATIONS**

**BLOCK**

\_total area: 3 208 m2

**BACKYARDS**

	Total area	Built area	%
_1:	1 206,0 sqm	319,7 sqm	26,5 %
_2:	776,4 sqm	326,9 sqm	42,1 %
_3:	63,4 sqm	35,4 sqm	55,8 %
_4:	116,8 sqm	89,4 sqm	76,5 %
_5:	137,9 sqm	90,5 sqm	65,6 %
_6:	113,2 sqm	77,5 sqm	68,4 %
_7:	267,9 sqm	103,5 sqm	38,6 %
_8:	161,0 sqm	89,1 sqm	55,3 %
_9:	365,2 sqm	218,0 sqm	59,7 %

**LOW COST HOUSING**

70,0 sqm 48,0 sqm 68,6 %

**BACKYARD NO.2**

Families/houses: 12  
Persons: 70  
Total sqm: 776

70 persons / 776 sqm = 0,09 p/sqm

**LOW COST HOUSING**

Families/houses: 1  
Persons: 5 - 6  
Total sqm: 70

6 persons / 70 sqm = 0,09 p/sqm

**measures**

- \_propose regulation

Moving process

Low cost housing, Dol

Block of study

## lack of functions

There is a lack of public functions and services in Aba Shawl. Certain functions have to be planned, while others will emerge as the area gets more accessible.

When executing the upgrade it is natural to assume that the streets being upgraded first, will start attracting service professions, and become important social and commercial areas. The space facing the streets will quickly develop into simple shops, barbers, beauty saloons, butcher, bakery, pharmacies, cafés and such, as the habit is in Asmara. This is a process that the inhabitants have control over, but implementing other bigger functions must be decided from the top. However, since Aba Shawl lies very close to the Planned city centre and the market areas in Edaga Hamus and around Medeber, many functions are already in close range. Functions that should tie inside Aba Shawl are more of a

municipal character, such as public health centres, educational functions, police station, shower stations and water taps. Because the street tissue is so tight, a thorough mapping of where it is possible to build new buildings or re-use old buildings should be done in order to be able to prioritize these municipal functions. In areas where it is impossible to build new structures, one should take use of the vertical free space. Adding new functions, both planned and unplanned, will increase the economical activity and provide jobs for the residents.

**measures**

- \_increasing the accessibility is to facilitate the emergence of functions

## economy

We are proposing a sustainable strategy for the future development of Aba Shawl. When the community itself creates some of the resources it is a consumer of, this becomes an economic advantage. The establishment of allotment gardens and a bigger possibility of growing your own food affect the economy of the private household in a direct and positive way. Being able to sell the excess water, soil and fertilizer also gives an income that can be used to maintain the systems within Aba Shawl.

As the accessibility gets better and shops and other public functions follow, this will stimulate an economic growth in the area. It will provide jobs for the inhabitants and thereby a higher income level.

Upgrading the water distribution network, increasing the accessibility and the emergence of new functions will also increase

the status of the area. The same accounts for the sustainable strategy chosen. Aba Shawl will be a pioneer within a sustainable development and the rest of the city can look at their solutions as an ideal.

**measures**

- \_all previously mentioned measures affect the economy