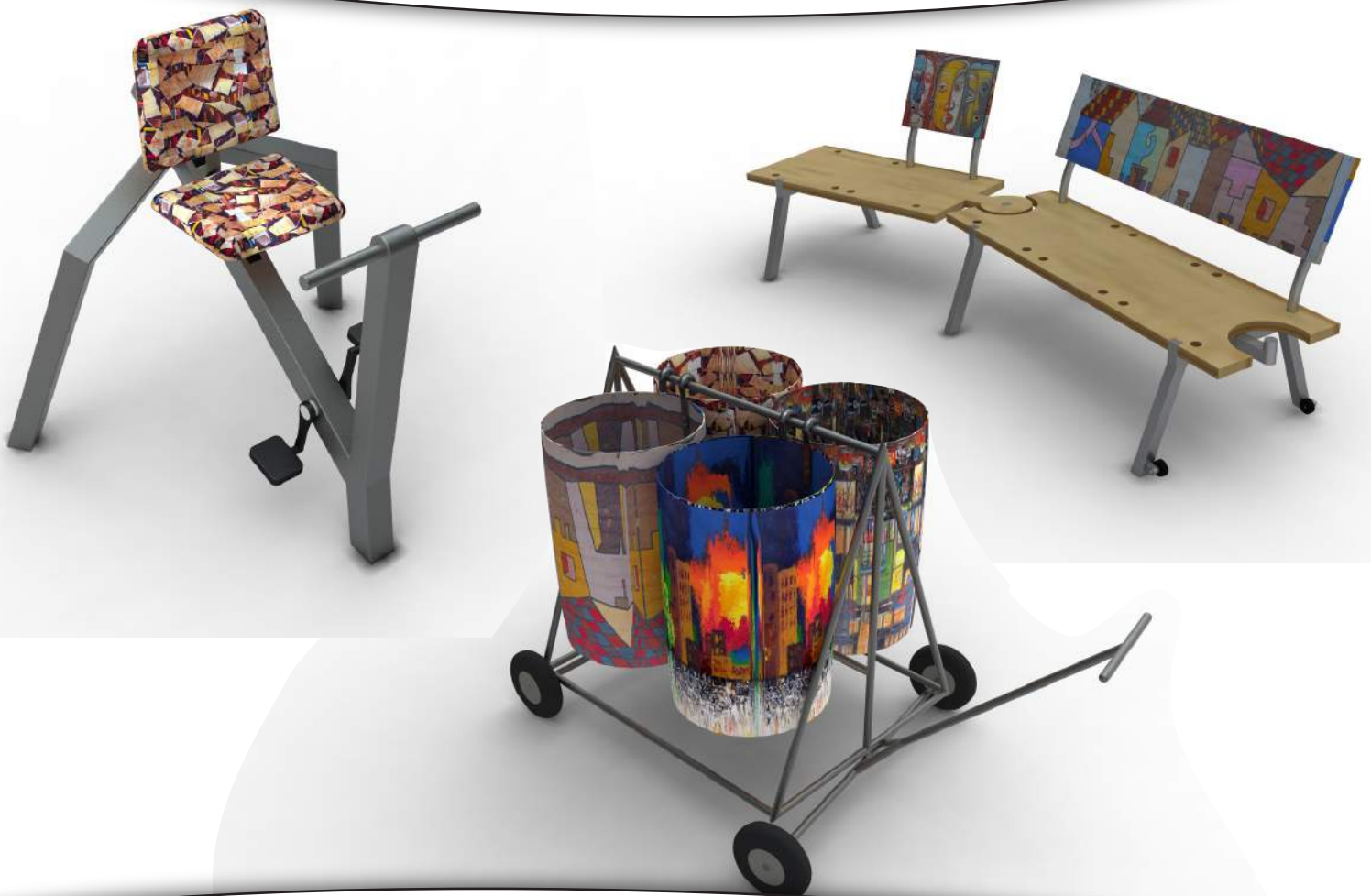


INCLUDING SOCIAL COHESION IN PRODUCT DESIGN (103029)

FINAL REPORT



Group 8

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ABSTRACT

In this report three 'Community Integrated Product Systems' are described. Nane, the Social Entrepreneurial Design (& Trading) Group, which has been working on these systems believes that their business is, in itself, socially responsible because everything they do is geared toward connecting people through products, which subsequently enables individuals to support themselves and their families.

The first system is called the Pedal Place, which refers to the place at the community center where one of our employees works to provide people with LED lighting while improving the social cohesion of the slum. The core of the concept is that people will work together to get hazardless lighting in their homes, community center, school, etc.

The second system Nane developed is called Barrels. This time we set out to not only improve the surroundings these people live in but also provide more capital to the slum in an earnest way. The slum is being kept clean because we have created an infrastructure in which garbage has become valuable and the bags created from these materials are sold to the 'Bijenkorf'. The money earned is in turn invested in the slum.

The third and for now last system is called Bukawa bench. The focus in this project was solemnly improving the social cohesion; the fact that we were able to make money was a (pleasant) side effect. We chose to name the bench after our own community because of this focus, and the bench has really become an integral part of Bukawa.

Of all these projects the first five years have been forecasted, and from these forecasts we can only conclude that they would be very successful, not only at providing a steady income to the slum but mostly at maintaining and improving the social cohesion between the residents at the three levels; social capital, face to face and sense of belonging.

1. INTRODUCTION

The last nine weeks we worked on multiple Community Integrated Product Systems (CIPS), to be implemented in slums. All these product systems had to focus on improving Social Cohesion, which can be measured by three main characteristics; Face-to-face contact, Social capital and Sense of belonging. Each design is judged by a Harris-profile to see whether it stimulates this cohesion. Next to the social cohesion there were a few other aspects that had to be planned, such as the feasibility, a financial plan, a business model and an introduction plan. This complete report contains all three modules in a chronological way.

There were three cases, in each case we had the same structure to come to a final design. Each module, our process is based on a model called the 3-I model (Identification, Integration and Implementation) which serves as a guideline throughout the project. Each product system was meant for a certain slum Setting X, in our case this setting was a slum called Bukawa located somewhere in Africa.

The first module was based on a pedal power system which was able to charge a battery to light a LED-lamp. The second module was a garbage collecting system where the garbage was re-used to make bags out of it. The third and last module was to design a mobile furniture system which was useful in the slum and which could also be sold at the Bijenkorf.

2. BACKGROUND

2.1. ABOUT NANE

As a young designer company, Nane has a lot to learn. We have written our own mission statement and a vision, to determine our view on the project and the focus on which we can always fall back.

MISSION STATEMENT

At Nane we are constantly committed to operating at the highest level of integrity. Our strong commitment to responsible business practices is reflected in everything we do – from the products we develop, to the high level of integrated communication with our customers and thus with the community. Nane is about giving people opportunities in becoming self-sustainable. The believe that our products can only be satisfying if they enhance social cohesion and help our customers on all levels, determines the way we do business.

Nane's business is, in itself, socially responsible because everything we do is geared toward connecting people trough products, which subsequently enable individuals to support themselves and their families.

VISION

In the future Nane will become the foremost important Social Entrepreneurial Design Group (SEDG) for the less fortunate of this earth. Nane will provide all people in slumps with integrated product systems which enhance their quality of live and is the first stepping stone to creating a better life. We envision a world in which everybody has access to clean water, food and light, a world where everybody is granted the opportunity to earn his own living and make something of his life.

In appendix A, more information on group dynamics and the house style design can be found.

2.2. METHODOLOGY FOR DEVELOPMENT

2.2.1. GENERAL APPROACH

The general approach to each module confirms to the 3-I schedule. Starting with the identification, different locations of the slum area are used to create scenarios. Next all interesting elements from the different location are ordered. From this list first a mind map and later a matrix were developed. The mind map helped to cluster the ideas and the matrix become a leading list for the further evolution of the product. From this point a system was developed. This step was often elaborated by a brainstorm from the complete group. The system than functions as the backbone for the future product, since no product will succeed without a proper system.

The next phase was the integration. During this phase the sub scenario elements and system were combined in a final scenario. This helped to illustrate the ideas and foresee important points for the implementation. This is also the step in which the product becomes more defined. From the list of requirements ideas are sketched of which some are worked out to concept level. After selection the final design is worked out.

The final phase, called implementation, concerns how the product is introduced to the community and refers to the element list created in the identification phase. Furthermore the business plan is worked out. Objectives, the product, organization, marketing and prizing are worked out here.

Every product case was based on a micro credit, which is worked out in the feasibility study. The last subject matter is the up scaling. Here the expansion to other slums is treated. All reports finish with a conclusion. All modules were supported by a 3D scenario of our slum, with which we visualized different scenarios. In the next paragraph, this will be elaborated more in-depth.

2.2.. 3D SCENARIO MODELING

For our project, we are building a 3D model of our slum Setting X, so we can test different scenarios in an imaginative environment. The model consists of 3D buildings of houses and facilities the people in our slum have access to. A total of 40 households live in Setting X. The facilities present include all listed in the Case Analysis (page [x]), like a Community Center, School, various Workshops and a media center.

MODELING MOTIVATION

For the modeling of our 3D model, we started out with a base of 100 by 60 centimeters, corresponding to 100 by 60 meters of slum. For the sizes of the buildings we used the map, which could be found in the reader. We used it as a guideline and didn't scale the map exactly, because we thought the buildings would be too far from eachother if scaled precisely.

As a foundation, we created a foundation image with Adobe Photoshop. A muddy base layer with some hardened gravel-like paths between the buildings. The models of the houses are build of foamboard. We used this material because it will be used often at the faculty of Architecture. These houses could be built up easily and they are strong enough if we want to move and edit them many times. There is a catch however. The foamboard we use, looks very clean and because we want the create a realistic feeling with our 3D model, we used a lot of other materials. With cardboard, wood and various concrete, plaster and metal textures printed on paper, we were able to create far more realistic facades and roofs for



Figure 1 - The 3D scenario setup.

the building. Almost all materials were treated to look decayed. To play different scenarios, we use tiny plastic dolls which represent the habitants.

EXPECTATIONS

Our 3D scenario is built to create more feeling with the slum. Therefore, we have build the houses like real houses from a slum and we place also peoples in our 3d scenario. These people are not glued to the board, but can be moved around. That way, it is possible to create specific situations. For example, we could bring all the villagers to a central place where Power Pedal Stools are placed. Because of the 3D scenario we expect to get a good feeling for the situation the slum villagers are living in. We also think the 3D scenario is a good method to get all the Nane team members aimed at the same direction. If we would not use a 3D scenario, every team member would develop his own vision. We also want to make some pictures of specific situations so we can show these in our report. This will make it a lot easier to communicate these situations. Thus, we believe the 3D model will have a high added value.



Figure 2 - Some photos of the finished 3D scenario.

2.3. THE SLUM SETTING X - 'BUKAWA'

For developing the three different Community Integrated Product Systems (CIPS), a fictitious setting in a slum (Setting X) has been created to create a background. Our slum is called 'Bukawa'. Different elements will be analysed here.

THE COMMUNITY

Everyone in the slum is connected to each other in one or another way, whether they are neighbours or relatives, do the same work, take a walk in the park or meet at the community center. These people all have their own responsibilities and functions. The village consists of 40 households on a surface of 60 by 100 meters which also contains other buildings. These buildings are:

- Supermarket
- School
- Local Authorities
- SEDG building
- Waterbassin
- Community center
- Workshop Wood
- Workshop Steel
- Atelier Fabric
- Mediacenter

An average household in the slums consists of 6 persons. A father, a mother and 4 children. When realizing how small the houses are, it's easy to understand why the children are always outside wandering the streets or garbagebelts. The beauty of a community that lives in a slum is that everyone is equal. Nobody is better than their neighbour or friend so there's less envy and more respect.

THE ELEMENTS

The surroundings in a slum are very tight, which means that there is limited space to create new things. Most of the area is covered with buildings and houses to optimize the use of the area. The people in the slum have the possibility to use several elements around them to create wealth on both social and economical level. For social contacts there's a community centre and there's the possibility to meet in the park or on the road. For wealth you can work at the supermarket, one of the workshops, the local authority or at the school.

To create a future for the children there's a school which provides education for a solid condition where children can grow up. Of course not everyone has the possibility to work at one of the stores. There's a percentage of the community that heads over to the 'big' city to search for a job there or end up begging for money.

THE INFRASTRUCTURE

Because of the little space left in the area there isn't a great infrastructure. The houses are placed close together as well as the shops. In the center of the area there's an open space where people can meet and children can play. The advantage of everything nearby is that you never have to walk further than a 100 meters to get to your destination. There are certain paths between the houses and shops which are used to travel so you will undoubtedly run into someone else and have a chat.

THE LOCATION

The slum is nearby Johannesburg in South-Africa which defines a part of the culture but this doesn't mean that this concept is aimed only on that segment. The concept can be used in every slum around the globe. The streets are full of sand, stones and dirt which doesn't stimulate the health of the community.

3. MODULE 1

PEDAL POWERED LED LIGHTING



The first case is about the lighting of houses. Nowadays the lighting comes from kerosene and candles. These hazardous open flames lead to bad air quality and are expensive. LED lamps form an alternative. The batteries for the lamps will be charged by manpower via a pedal power machine. The system describes where the materials come from, who is involved and how the cash flow works.

3.1. PHASE 1 - IDENTIFICATION

3.1.1. CASE ANALYSIS

In this chapter, we will analyse the concept of the product of this case, the Pedal Power LED, and the setting we will try to integrate it in, the slum that is also known as Setting X.

CONCEPT IDEA

HOW DOES IT WORK?

In simple words, the technology of the Pedal Power Stool consists of a seat with pedals which generates electricity by actuating a dynamo. This dynamo can be attached to a battery which will be charged while pedalling. In 10 to 15 minutes the battery will be charged and ready to be used. The battery can be connected to a LED which will give light for approximately 10 hours. The design of the Pedal Power is not yet defined so there is a lot of freedom.

WHAT IS IT MADE OFF?

The parts necessary for the Pedal Power are the following. A framework is needed to keep all the parts together and to provide a solid base which can take the weight of two people for safety. There will be two pedals which are connected to a gear that drives the dynamo. All the parts can be connected by screws and bolts. Furthermore there has to be a part where you can sit on or lean against while pedalling. These are just basic parts which are not yet fully defined so changes can be made easily.

The materials used in the Pedal Power are undefined yet but some characteristics can be identified for the different parts. The material for the frame has to be weather resistant (e.g. rain, sunshine, heat, etc.) such as stainless steel and strong enough to carry the weight of two persons. The material of the seating has to be soft enough to support a person without creating any discomfort. The pedals have to be firm so that there is no powerloss between pedals and dynamo. The dynamo has to be easily dismantled so all dust and dirt can be cleared.

WHAT IS THE LIFECYCLE?

The lifecycle of the complete package consists of multiple cycles because of the differences between the products. A LED has a lifecycle of approximately 30 years and a battery goes on for about 5 years which means you need 6 batteries for 1 LED to synchronize the lifecycle. We don't know yet what the lifecycle will be of the Pedal Power. In the next phase we will consider the durability of the materials and eventually determine the complete lifecycle.

HOW DO YOU USE IT?

First of all, you must have a battery to use the Pedal Power. Or else it would be useless to pedal without charging anything. You take the battery and connect it to the dynamo by a wire or direct connection. As soon as it's connected you are ready to charge the battery by pedalling. Take a seat on the stool and ride it like a bicycle. After 15 minutes the battery should be charged and you can step of the Pedal Power and disconnect your battery from the dynamo. The battery is fully charged and can be connected to the LED-light which will work for approximately 10 hours.

FOR WHO IS IT?

We have to take in account the differences between people. Everybody has it's own size and length so the Pedal Power has to be flexibel in adjusting different parts. The multiple groups that ride the Pedal Power are:

- children
- adults
- elderly

In these multiple groups there are differences to keep in mind like size and strength.

The distance from seat to pedal determines the length of the leg so it has to be adjustable to be usable by all the groups. The seat cannot be to high from the ground because the children would have a problem in getting up the Pedal Power.

In addition to the first part there is another technical issue that has to be discussed. Because of the difference in length the seat has to be adjustable and there are multiple ways to achieve this. In the integration part the adjustable seat will be further defined as well as all the other parts and features.

3.1.2. PERSONAL SCENARIOS - ELEMENTS

SCENARIO DESIGN OPPORTUNITIES

To identify possibilities when implementing the Power Pedal Stool in the slum Setting X, we first came up with ten 'Fields of Opportunities'. These were allocated to the individual team members of Nane. Each member, with his or her two Fields of Opportunities, generated five small scenarios that showed new interactions in Setting X. The scenarios per team member can be found in appendix D.

Each sub scenario provides multiple design opportunities for a final scenario, which is generated next. All elements coming from the sub scenarios have been ordered and grouped according to the Field of Opportunity.

FAMILIES

1. Charging is a task of the children, to teach responsibility
2. Learn children responsibility, first charging --> then playing
3. Children can interact with the lights safely
4. Children can have their own light to play with
5. The elderly can't pedal for themselves, so younger family has to take care of charging the battery.
6. Families have dinner around the lamp and interact
7. Enjoy radio (broadcasted by lamp) together with family, neighbors and friends
8. Spend evening together with people who have light
9. The lamp provides a central workplace.
10. People meet each other at the pedal bar
11. Provide information to friends about the new lamps
12. Better for health (no more smoke in the houses)
13. Cheaper lighting
14. Individual can buy a product and lease batteries or time on the pedaling machine
15. Relatives work together and exchange jobs. Someone is responsible for the batteries, someone other for water etc
16. Providing a living

PARK

17. Meet with other kids who have to charge their battery
18. Competition between kids
19. Play with each other
20. Helping others
21. Pedal Power's in a public area so everyone can use them

HOMES

22. Multiple lights in a home are possible, to have separate 'interaction areas'
23. Local business to sell lights and batteries
24. The light is a meeting point in a home
25. People go to a neighbor that has a Pedal Power Stool
26. Place where a stool is found becomes a meeting place
27. Every house can have a Pedal stool
28. Not everyone that owns a stool will be happy with others using it
29. People don't come out of their homes at night, because they stay inside around their lamp.
30. A lot less accidents because of the new lighting
31. The children peddle while mother is busy (laundry ore something else)

WATERBASIN

- 32. Power pedal stools are placed at the waterbasin
- 33. People walk via the water basin to the peddlebar

COMMUNITY CENTER

- 34. Power pedal stools are placed at Community Center
- 35. Some public stools at the Center, but also stools available for purchase
- 36. Place were the product can be used (no room)
- 37. Pedal machines available for a low price
- 38. Is the backbone of the community
- 39. Cultural events take place at the community centre
- 40. Cultural activities can enjoy light
- 41. Leader can mobilize and organize people
- 42. More information at the community centre

BUSINESSES

- 43. Batteries are sold at discount, while a small fee is charged for using the stool

LOCAL AUTHORITIES

- 44. Authorities select the people that can run the pedal business. This can be based on status and location
- 45. Authorities check on misuse of the position of people in the pedal power stool project

BANK

- 46. Lent microcredit to villagers to start their own business
- 47. Lease program for a stool, lamp and battery for a lower price than paid for old lighting

WORKSHOPS

- 48. Employees can get a discount on the stool
- 49. Can use the light to increase production time available
- 50. Can build the product

SCHOOL

- 51. Inform families via children
- 52. The batteries will be charged after school time

NEW ENTREPRISE

- 53. Start of a new business in the field of battery recharging/leasing
- 54. (Multiple) product(s) are/is placed here
- 55. Somebody starts his own company for renting the peddle machines, selling full batteries
- 56. Somebody sells time- tickets for using the pedal machines
- 57. Earning a dollar for helping elderly people out
- 58. Informing community about hazards old batteries
- 59. Collecting old and broken batteries
- 60. Design, produce and sell 'flashlight'

ROAD

- 1. Keeping children healthy
- 62. Collecting old batteries because of hazards
- 63. Social pressure to join the LED program
- 64. Pedaling along the road with friends or neighbors
- 65. Darkness --> no sight

66. Light in the darkness

LOCAL AUTHORITIES

67. Provides the micro-loan

MEDIA CENTRE

68. Broadcast radio to lighten everyday life

69. Print information posters

70. Makes a radio-commercial

SUPERMARKET

71. Buy newly charged batteries (small price when handing in old one)

72. Power pedal stool are placed in the shop

73. The shop rents the pedal machines

WORK

74. Batteries will be charged up after work

3.1.3. METHODOLOGY FOR EVALUATION AND INTEGRATION

From the previous list all elements have been ordered in a mind map according to the three leading set-ups. The set-ups differ in the availability of the power pedal stools. Central in the mind map is the pedal machine. In the corners of the mindmap the engagement of the community and workability are listed. The top right corner provides information about the consequences of the plan. The lower left half gives general information and the remaining corners concern the the families and homes. Pictures of the mind maps have been added to the corresponding scenarios.

Engagement Workshops	Consequences Plan
General Information	Families and Homes

Figure 3 - The setup of each mind map.

The three mind maps will be developed to three group scenarios. Each scenario will consist of one story per consumer groups, coming to a total of 9 short plays. The set-ups differ in the location and payment for the light systems. The customers will be children, grown-ups and elderly. Next a Smart Grid Analysis will be performed, with weighted criteria. The best integrated plan will then be used and the implementation will be worked out.

One alternative is that the pedal machines are stationed in a central place (community centre, park, unique selected citizen, etc.). Every household has bought a lamp and battery. One can go the central place and pedal a while to recharge the battery. For this service a small fee will need to be paid. This way the loan for the central pedal machines can be paid back.

A second alternative is that the pedaling machine is not used by multiple people but is locked away. People then buy a newly recharged battery. In the price a deposit is included, meaning people bring back the empty battery for a discount. This way the empty batteries can easily be recharged. It provides an income for some people to work in the recharging shop. Also families only need to buy the lamp, thus saving money on the initial costs and lowering the threshold to switch from polluting and expensive lighting systems to cheaper and healthier systems.

A third alternative is that people get a micro-credit from the local bank. With this money people can buy a pedal machine, lamp and battery. Based on a budget of 8 dollars a month for conventional lighting, a 100 dollar package (stool, battery and lamp) will take 13 months to be earned back. A longer lifetime is more likely. Also additional batteries and lamps will be at a lower price since only one machine is needed. So to double the amount of lights (formerly 16 dollars) it now will only take about 6 months.

Next to creating these group scenarios, the list with design elements will be kept in mind for the rest of the case project, because we feel some elements are applicable in all product scenarios and therefore do not have to be pointed out every time. These important elements have been ordered in three groups, concerning the social aspects, product aspects and finances, see figure 4. Also, a visualisation of the system as we see it now has been made, see figure 5.

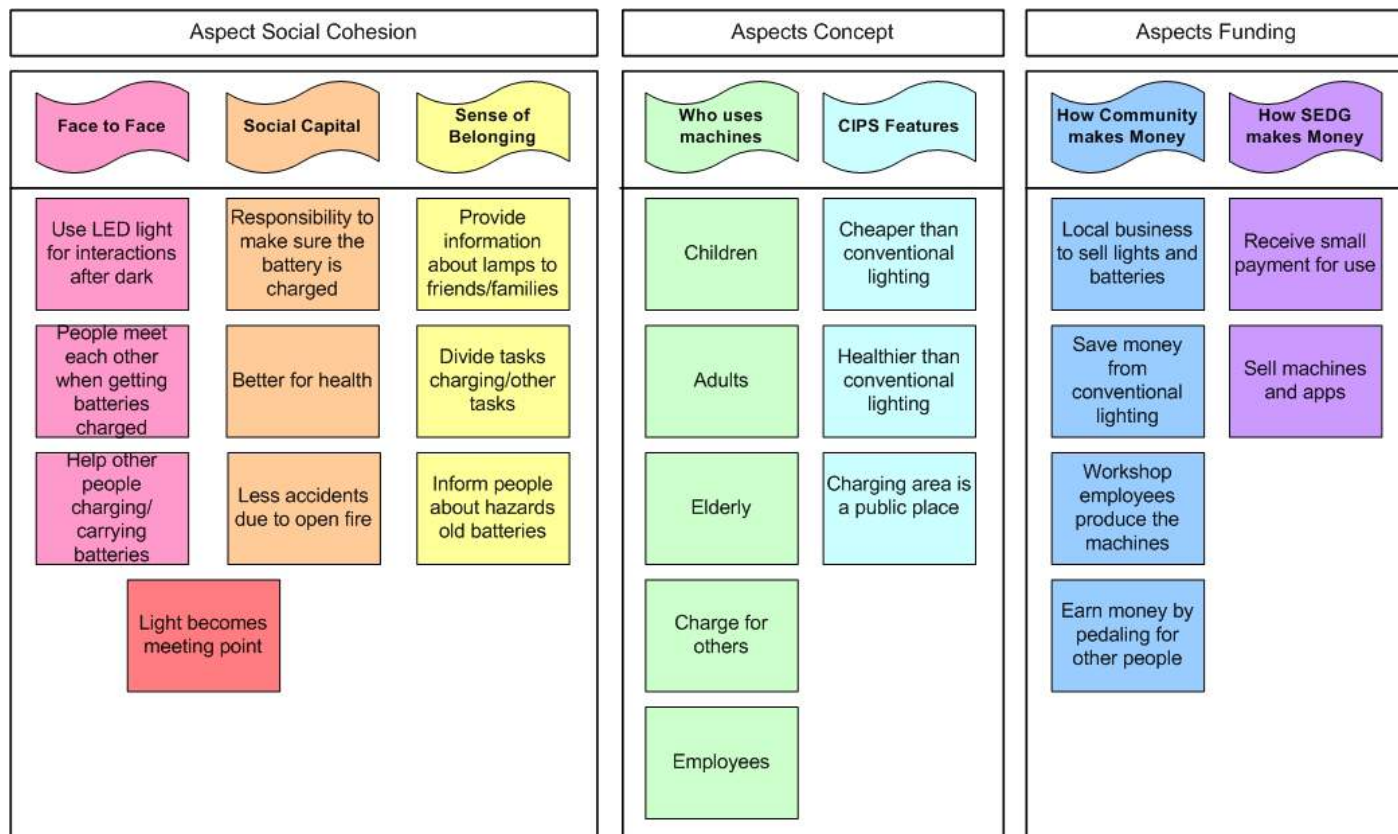


Figure 4 - Matrix with important elements listed.

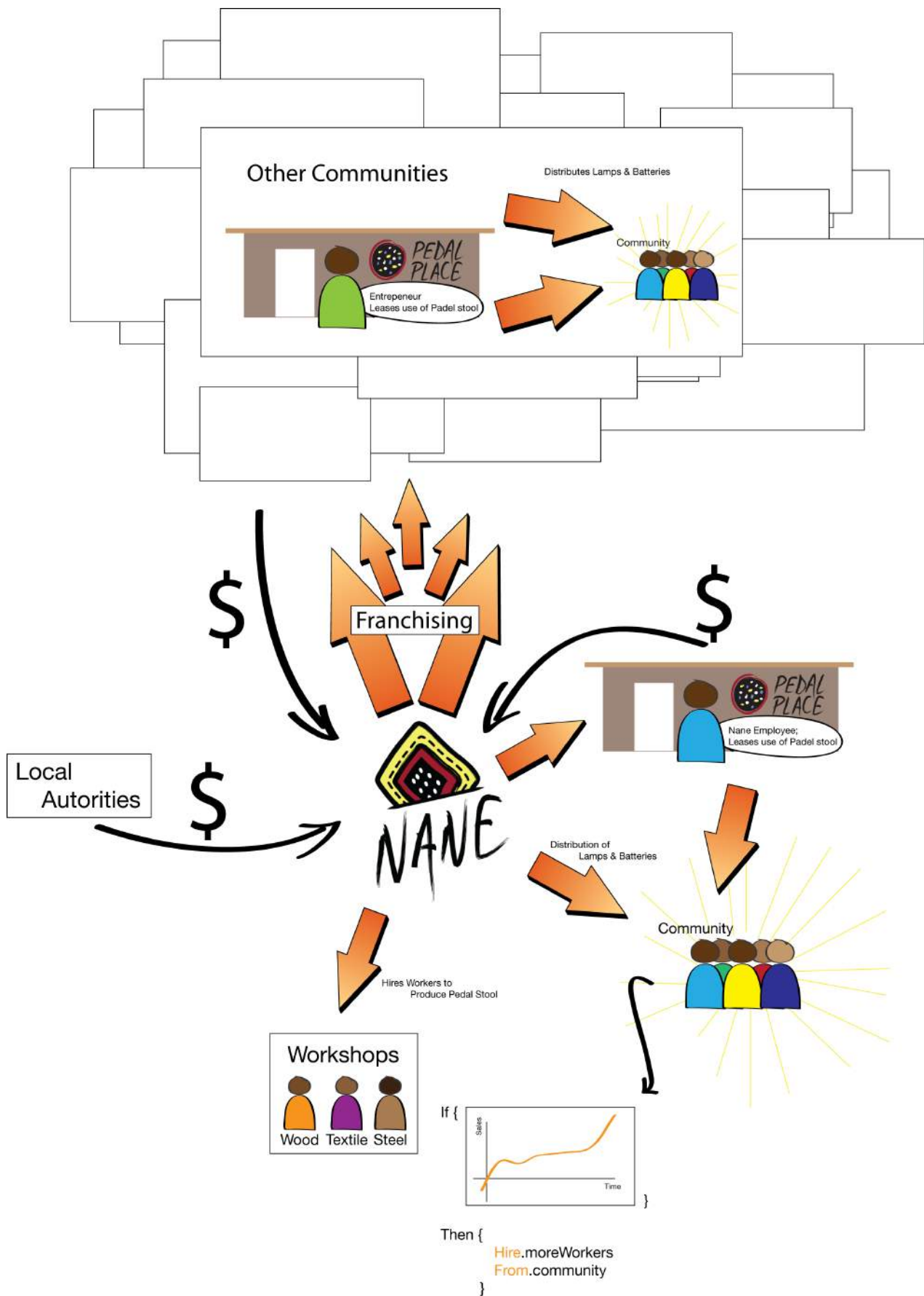


Figure 5 - Visualisation of the product system.

3.2. PHASE 2 - INTEGRATION

As pointed out in the previous chapter, we created 3 group scenarios from the design opportunities. These scenarios were rated using a Smart Grid Analysis, after which a final scenario was created.

3.2.1. GROUP SCENARIOS

SCENARIO 1 - POWER PEDDLE MACHINE AT CENTRAL LOCATION

General outline situation:

In the slums a central place has been equipped with multiple power peddle machines. People can come here and pay a small fee to rent some time on the machine to recharge their batteries.

1.1 - Children scenario:

"Hai Joseph, were are you going? Class starts in a few minutes!" "Sorry Sasha, I cannot come today, I have to go to the garbage dump and collect plastics, mum's ill and we don't have any more candles." Joseph sadly replied. "Will you come by when you're ready?" "OK, but now I have to go or there will be too many other children, see you." Joseph jogged away and Sasha turned to the low building at the top of the hill.

Bong, bong, bong the bell rang. "Class starts now" Mellan, the teacher, called out across the hill. Some thirty children, differing in age from 4 to 15, came walking to the building. Since the organization Cordaid childvoice had come, there was more studying material. Combined with Confella's brother, who had studied in the church, their neighborhood had a real school.

Hello children. Today's lecture will be mathematics. "If you buy 6 candles to light the room for 1 dollar each, how much does that cost in total Sasha?" "6 dollars" Sasha answered. "And if one candle lasts 5 days, how long do you have lighting?" "30 days, or one month." "Very good" the teacher said. "So if a LED-lamp costs 20 cent to recharge, and lasts 3 nights, how many nights can you have light for 6 dollars, Alvida?" "I don't know miss." Alvida answered. "Anyone else?" "3 months!" Sasha suddenly exclaimed. "That is a huge difference." "And that class, finishes today's lessons." Mellan said.

After class Sasha slowly walked home. With Joseph in the city there would be no fun. Hours later Joseph finally returned. In his hand was a small stump. "Look what I found today Sasha!" he exclaimed. "I found a small piece of a candle. With that and the 4 cents I have earned today I can take care of my mum. I just don't know how much longer we can keep on with this. The smoke is making her cough all the time." Joseph said. Walking together to Joseph's house, Sasha told about today's mathclass. "Perhaps you should tell your father to buy such a lamp. The pedal chairs at the ommunity centre look really funny and when I convince my father we can have a little race who charges fastest. It would be fun!" "It would be" Joseph replied. "I'll talk to dad. Shall I come over to you after dinner?" "Off course Joseph, you're always welcome! See you!" and Sasha walked back to his house.

1.2 - Adults scenario:

Mambello fumbelled with his shirts. Finally he had enough and turned on the light. Zwany, his wife, softly moaned so het quickly gave her a kiss. The new LED lamp shined brightly. That was such a good benefit, the lamp could be turned on any minute. Finally Mambello's shirt fitted and he was ready to go. A new day had started and with the sun almost rising he was just in time for his work at the workshop. Till noon he would be melting and welding tubes for the pedal chairs. With the NANE chair project there had come some work, and responsibility, to the neighborhood.

“Good morning Orlandé, how are you doing?” Mambello greeted. “I’m fine Mambello, and you? Troubles getting up again?” “I’ll manage. Will you start the fire today? And have you heard anything from Andries, we need those pedals today so we can assemblage the new chair”. “Ow, with you starting about those chairs, the one with the red seat has broken down so Gazell will bring it tomorrow. Enough work coming from that project, right? Orlandé answered happily. “Gives me enough money to buy a second lamp soon.” “and have an appropriate dinner for once.” Mambello interjected. “So let’s start” Orlandé said as he walked to the fireplace.

“Whooh, that was a long day.” “I agree” Mambello replied.”But those 15 cents do come in nice. Let’s go to the Community centre. I’ve got my battery and Zwany kills me if I forget to get it charged again.” “OK, ours is still charged, but I will come along, Chadou will probably also there and I need to have a word with him. As Mambello and Orlandé walked to the community centre they passed Charid. He happened to be on his way to the community centre as well and joined them. At the community centre Mambello and Charid walked to the pedal chairs. Being a workshop member Mambello only had to pay 10 cents to charge his battery, instead of the 15 cents that Charid was charged with. This off course meant that Charid again held his tirade about the unfairness of that construction. Orlandé quickly tired of the conversation and walked away towards Chadou. When both batteries were charged Mambello walked home.

“Here me darling”, he said to his wife as he put the battery into her hands. “Fully charged so that should help us for a day or three. What’s for lunch?” “That depends, have you brought anything from your way home? Zwany answered darkly. “O, I’ll be damned. I totally forgot, I’ll go and get it right away.” Mambello said and he turned around and started walking back.

1.3 - Elderly scenario:

“Hey Titzia, is that young boy of you still going to come? It is getting late.” Andorra asked. “How am I supposed to know? His mother is fine but that father of him has no standards. We shall see.” OK Titzia, but don’t blame me if we don’t have any light tonight.” “Oh, I think he is coming, here that sound?” “Hi gran, hi Andorran, how are you doing?” “You’rs late boy” Andorra snapped. “Well, I’m here now, am I not” David replied aggressively. “Lock it boy” Titzia said. You are late, where have you been?” she asked. “School took a bit longer. Today we had some human right lectures.” “OK, well you better get started boy, here’s some money for the power machines and there is the battery. It is just too heavy for me to carry and it is such a long way to the community centre” Titzia explained. “I know gran, that’s why I’m here to help.” “Here’s a sweat and I’ll have some warm bread ready when you come back. Now off with you.” “By gran, by Andorra, I’ll be back before you know!”

SCENARIO 2 – EVERYBODY OWNS HIS OWN CHAIR

General outline situation:

With the help of the local authorities and the bank micro-credits have been provided for many people in the neighborhood. With this money people were able to buy a pedal power machine to charge their batteries at home. History has proven that due to social pressure almost all funds are paid off.

2.1 - Children scenario:

“Can we now play some Awale? Yesterday was reading and the day before storytelling so today is for a boardgame, right?” Little Gonesh asked his father. “OK, you want to play Awale, than get all the stuff and get you brothers and sisters.” Dad replied. “Fashan, Debry, Goolie, come home, I’m gonna beat all of you with Awale” Gonesh called to his brothers playing soccer in the last bit of sunlight. “You’ll never beat me, shorty” Fashan replied. Since it had become completely dark father turned on the LED lamp. After some fifteen minutes Gonesh indeed seemed to be winning. When Debry was about to make a magnificent manouvre the light suddenly flickered and went dark. Everybody started to talk trough each other and soon father called for silence. “Everybody keep seated. Goolie, I think it is your turn. Who was sitting in

front of the chair? Fashan, was it you?" "Yes dad" Fashan replied. "OK, you switch places with Goolie and on the way get the covers from the stool. Gonesh can hold them. Than Debry, you connect the battery to the stool and Goolie can start to pedal." Some ten minutes later the battery was charged and the game, and competition between Gonesh and Fashan, continued.

2.2 - Adults scenario:

We finally got a new PP, says nasri to fiorla. Their old PP was broken so they had to pedal for energy at their neighbours house for almost 2 weeks. With this new PP they wouldn't have to bother their neighbours so much. In the afternoon their neighbours came to visit and tell that they couldn't come over to pedal because theirs was broken too! Nasri starts to laugh and shows them their new PP, painted by fiorla in an ancient style. He says it's not a problem because now you can pedal at our house for the next couple of weeks! It's great having you guys around to talk and laugh with! What's the problem with your PP neighbour? Well, one of the pedals broke while I was charging the battery so we can't use it anymore. But I can help you with that! Because of the new PP they bought he had to take a micro-credit loan and that has to be paid off in three months. That's why he took another job at the steel workshop to earn some extra money. He took the PP of the neighbours with him to the steel workshop and welds the pedal back on the frame. After he's done with his work, he walks over to his neighbours and returns the PP. This way it didn't cost him a thing and he was eager to return the favor! Nasri and his neighbour agree on helping eachother when the PP is broken or need a hand when charging the battery.

2.3 - Elderly scenario:

Grrrrrrnk, Grrrrrrnk Hasid lay snoring. Sabrina poked him in the side. "Wake up, it's not yet time to sleep." She told him. "I know, I know, but these evenings are just so long. I know all your stories already. I miss it to have the children around. Since everyone has their own lighting everybody stays inside. All we do every evening is list

en to your stories and sometimes the radio." Hasid replied grumpy. "I want my suns and grandchildren around me." "We could just go over to their place, darling" Sabrina tried. "No, it's their responsibility to visit their parents. If they don't want me, I will not go there either, so don't start again." He snapped. "OK, but you could just be happy that with the micro credits everybody is able to buy a pedal machine for his own and still save money compared to conventional lighting" Sabrina snapped back. "You just fall asleep again, and if you stop snoring I can listen to the radio."

SCENARIO 3 – BUY BATTERIES IN A SHOP

General outline situation:

In this scenario there will be a shop where people can 'buy' or 'rent' a fully charged battery to use and when it's low on energy they can hand it in and a part of the price paid will be returned.

3.1 - Children scenario:

As Mardy goes to school he can't stop thinking about the afternoon. This will be his first day working in the PedalShop and he's overexcited. As soon as the last class is over he takes off to the PedalShop and reports to his 'boss'. He's given a tour throughout the company and the boss shows him where he will be working. "Well boy, that about ends the tour. This will be your station. As you can see there are multiple PP's and everybody is already working, you better start as well." "Yes sir", Mardy replied. "So boy, three hours a day, three days a week, can I count on you? If you charge 10 batteries per day you will get 50 cents so you better get started. While pedalling it's allowed to interact with the other kids as long as you keep pedalling." his boss explained. "Hey new boy, you're going like a machine, how about a break guys? I think we have been going for an hour." One of the big kids said. At the end of the workday Mardy is very tired but also very satisfied! He feels like he's on top of the world while walking home. "Hey Mardy-

boy, how was your first day?" his father asked. "It was a good day dad, look at all that money I earned!" Mardy exclaimed. "Now that's very good son, I'm proud of you, go get inside and give that money to your mother."

3.2 - Adults scenario:

Sira is waiting at the bank to apply for a microcredit for her new shop. To start her new business she needs a lot of money so she has to be convincing. "So you want to start renting those pedal machines" the employee said. "Yes please" Sira replied. "The bank agrees on one condition, there has to be an authority which watches over the shop to check on the results" the man said. After 2 weeks the shop 'RentaBattery' is ready to open. Sira's done a lot of things the past 2 weeks like hiring people, buying PP's, buying batteries and organizing the shop. She even went to the local media to advertise for her new shop on the radio. When opening the store there are already customers waiting in line to congratulate her with her new shop and rent a battery. "Hi Francisca" Sira greeted her friend. "Hi Sira, so how is business going?" "Oh wonderful Francisca, it is only 8 months since I started but I have almost finished my debt to the bank, business is booming. I think I will be able to buy a new machine soon." "How fantastic Sira, I'm so proud of you having made something from life here."

3.3 - Elderly scenario:

Mugawe is standing in line at the shop to rent a battery to use the next couple of days. "Hey Geoff, you here?" "Yes, with these long nights I can use some light" Geoff answered. "I'm so glad we have these new lamps. I don't know where I should get the money for so much kerosene to burn all night." Mugawe told. "And with my son working here I even get a small discount!" she continued. "But even better is the fact that those new lamps do not give off so much smoke." "Are you going to the market on your way back Geoff? My sons are coming for dinner so I need to get some more" "No Mugawe, but I will walk along for the first part." Later that evening dinner is ready and the sons come. In the LED light they enjoy the meal together and have some fun.

3.2.2. SMART GRID ANALYSIS

Out of the three scenario settings we have to choose one that is most viable for our setting. We used a Smart Grid Analysis to make a weighted decision about the scenarios. This type of analysis has been chosen over a Harris Profile since a Harris Profile does not leave room for any weight in the importance of the criteria.

The three scenarios are as described earlier, the ratio shows how important we think the criterion is. Money evaluates how much investment the product in the scenario requires, as well as the return on investment. We think that it is really important because for one the target group for our CIPS do not have a lot of money and it will be hard for them to focus on long term investments of which the breakeven point lies far away in the future. Time is less important, the time we are referring to is the time it takes to recharge an empty battery, taking in account every act that is requires, from walking to the shop (in scenario 3) to the act of recharging itself (in Scenario 1 & 2). The criterion of Jobs evaluates the amount of work the scenario creates. The criteria of Face to Face, Social Capital and Sense of belonging evaluate the total improvement of social cohesion. Social Capital is slightly less important than Face to Face contact and Sense of Belonging and thus has a lower weight. The criterion of Realism evaluates to what degree we think this scenario is viable. There are some aspects that would reduce the desirability of the scenario that have not yet been evaluated with the other scenarios. Involvement looks at how relevant the scenario is for the three demographic groups; Children, Adults and Elderly.

	Ratio	Machines at central place	Everybody owns own chair	Buy charged batteries at shop
Money	3	5	1	4
Time	1	1	5	5
Jobs	2	2	4	5
Face tot face	3	5	2	3
Social capital	2	4	3	5
Sense of belonging	3	5	3	3
Realism	3	4	1	5
Involvement	2	5	3	2
total		8 0	4 6	7 4

Figure 6 - Smart Grid Analysis

As we can see Scenario 1 has the highest result. This is mostly due to the social cohesion parts. When you compare it to Scenario 3, we see that the Face to Face scores higher, this is because in Scenario 1 one would recharge while communicating (face to face) with fellow residents of the community, in Scenario 3 this only happens with employees who work at the shop and between the people who are coming to let their battery recharged with the person behind the counter. Sense of belonging has also scored higher because the community is closer connected to the pedal power chairs in Scenario 1 than in Scenario 3.

3.2.3. FINAL SCENARIO

In the slums a central place has been equipped with multiple power pedal machines. People can come here and pay a small fee to rent some time on the machine to recharge their batteries.

Tiari is waiting in line under the hot sun at the Pedal Place to recharge her battery. Today, one Pedal Power broke down so there are not enough machines to serve everyone quickly. Her husband is an employee at the steel workshop so he has a lot to do today. At the Pedal Powers there's a crack in the frame and it has a broken handle bar. Just behind Tiara is an older woman whom she does not recognize. "Hi, I'm sorry but I thought I should recognize you.." Tiari said, "I'm Luna, the grandmother of Jair, I believe he is a friend of yours?". "Oh of course, now I recognize you!" Tiari answered. "Don't you too think it is wonderful how our community has improved since the new LED-lighting system has come?" Tiari said. "The new jobs and shops make the atmosphere much better." Luna answered. "And with the local authorities this central placed enterprise works really well, except today than." She continued. "Yes, it's my turn now" Tiara says excitedly. Finally she's under the roof where the PP's are placed for some shadow. Everybody is asked to pedal no longer than 10 minutes because the line is getting too long and we all need energy. That's not a problem for Tiara, she's in the shape of her life and 10 minutes is long enough to charge the battery. When Tiara is ready charging she sees that Luna is getting a bit tired so she decides to help out. "Can I help you by pedalling for you, Luna?" Tiara says. With a tired smile Luna accepts the offer and steps of the machine. Tiara quickly jumps on and starts racing. Within the 10 minutes the battery is fully charged. "Thank you Tiara." "No problem, no problem." Tiara replied.



Figure 7 - The Pedal Place.

After Tiara was finished she leaned back to the wall and watched as Mati got on PP. Since he was too short to reach for the pedals because of his young age, only 7 years. Fira, his classmate, starts to giggle. "you wait, I will charge my battery much faster than you can" he grins back. Mati steps of again and adjusts the height of the seat within a few seconds. He jumps on again and starts pedalling. "What are you doing later today?" he asks Fira. "I don't know, I haven't got any plans. Have you got a plan?" she asks. "Well, you can come over to the small field behind the old school and join us for some soccer." Mati invited. "That would be nice. See you there." Fira answers.



Figure 8 - Tiara walking home.

As Tiara is walking home she sees her neighbour walking with some old batteries. He's got his own job in collecting the old or damaged batteries and delivering them to a disposal centre in the city. Tiara decides to see if her husband is still busy repairing the PP or has a moment to help her with the groceries. She walks into the steel workshop and looks for Gefry. "Gefry, are you there?" she asks. There was no sign anywhere of him so she asks the others where he could be. "He's at the PedalPalace to place to repaired PP and is expected back any moment!" Inde answers. "That's too bad. I have to go to school to teach the children about electricity and batteries and the danger it involves. Will you say hello to Gefry for me please?" Tiara asks. "Of course" Inde answers.

The Media Center even designed a poster with information about the new battery and LED system. Mauri of the Media Center has had a lot of advantages with the new system because now he can work even

when it's dark. Due to the evening light he decided to start up a new radioshow in the evening with all sorts of games to entertain the people. He needed a lot of light for this and kerosene would be far too expensive. So the LED-lighting is a 'helping hand' in finding his way around.

When Tiara is finished teaching the children the darkness is already falling. She hurries home and starts the fire for the dinner. Their neighbours are coming over for dinner because they don't have any light. They're out of candles and don't use the new system yet. Her husband Gefry finally enters the house after a long day of hard working. "Hello Tiara, my boss was so happy he gave me a dollar fee for fixing the pedal machine so soon. Let me give you a kiss and then I will go get the neighbours". "Ah Menish, I wish we could switch to LED lamp as well, my darling." Mella said to her husband. "I know honey, and we will do that soon, because if we just pay the fee for pedaling, we can use a battery and a LED light for free. Menish said. "Thank you for the dinner. So we will see you tomorrow" Mella says Tiara. "Yes, see you and good evening" Tiara answers.

The next day Mati wakes up with a yawn and checks on his mother to see if she is no longer feeling ill. The past days he was the one who had to charge the battery because his mother couldn't get out of bed. He was hoping she was well again so he could go to school and afterwards play with his friends. "Mum, mum, are you feeling any better?" he asks hopefully. "I'm sorry darling but I still feel really bad, can you charge the battery again today?" "I will mum, no need to worry" Mati assures his mother.

Mati goes to school with the battery and spots Fira also carrying a battery. "Hi Mati, my mum has to work all day so I need to charge the battery. Shall we go together?" Fira said. After school they walk together to the PedalPalace and find that the broken PP's have been repaired so there is no queue. They got on the PP and talked about the charging they had to do almost every day. "I think it is stupid." Fira said. "I want to go outside and play with the others." "I don't think it is so bad. I feel proud that my mum trusts me, and it only takes a few minutes. We can go play afterwards." Mati replied.

Tiara and Myra are walking towards the shop for the purchase of the LED and battery. "The new system is much cheaper. We don't have the money to start but with the credit we buy the battery and lamp and just because of the higher fee, we pay the battery and lamp off. Also there will be less smoke, which will improve our health". Myra says.

The shop gives her a charged battery and the LED. "So every time I charge the battery I pay 0,50 cents which includes the pay off for the lamp and battery. Then they go home to install the light and check if it works. "It's perfect!" Mella says. "Yes it looks great" Tiara answers. "Now you can come have dinner at our house too" Myra says. "That would be lovely Myra" Tiara answers.

3.2.4. LIST OF PRODUCT REQUIREMENTS

To specify the design of the power machine a list of requirements has been established. The requirements originate from the final scenario. In here the interactions between the people and the product have been detailed. Apart from the interactions the local wheater, culture and mindset has been taken into account.

USAGE

The power machine should generate electricity through men power. The usage should be mostly intuitive. For the use people pay a small fee and plug in their battery. The machine will not have a time indicator, nor a light indicating the battery is fully charged. A plus point of this approach is that the machine will stay as low-tech as possible. The downside is that people will sometimes pedal longer than necessary or the batery will not be fully charged causing it to last shorter than the estimated 10 hours.

ADJUSTABILITY

Since the targetgroup has such a large deviation in age and length the power machine needs to be easily adjustable. The height of the seat and handle bars and the distance between the seat and handle bars needs to be adjusted for the different people using it. This system should be easy to use so little education is needed. Also it should be a solid system since the usage will be intensive.

PROTECTION

Due to the low standard of living people have a small amount of money to spent on the system. When components can easily be taken off this will hapen. Past experiences show that the short term benefit of a few is easily chosen over the long term benefits of the community. Besides to the protection of the parts of the system, the complete system should also be protected. At night a sort of lock needs to be placed on the machines to prevent people from pedalling without permission. When this is not taken into the design, people will come at night to charge their batteries for free.

PRODUCTION

With the workshops available in the specified slum the production will be done locally, with local employees. This way employment will be stimulated and prices will stay low since no transport is needed. This way the distribution of the machines is also really easy. If produced locally, the machine needs to be constructed mainly from steel, wood and perhaps some fabrics. Also the connections and junctions from the frameparts need to be as simple as possible. This enables low educated people to work on the projects and repairs will be easier. With easy repairs the expected lifetime can de increased.

STRONG AND STIFF

Due to the chosen scenario a few power machines will be placed at a central place. All people will use these few machines so the use will be rather intesive. Also people will not always be educated in the appropriate use. This could lead to multiple children climbing on top of the machine for instance. That is why the machine will have to be overdimenshioned. The downside of overdimenshioning is that the materialcosts will increase. Since these will be a significant portion of the total costs the overdimenshioning should be reduced to a minimum.

WEATHER IN UENCES

With the wide variety of slum locations, many weather influence need to be taken into account. Water, heat and UV light are the most apparant factors. Corrosion can easily influence the materials characeristics causing potential problems for the framework. Heat leads to requirements for the thermal conductivity of the materials used coming in contact with the body. UV light can, just as water, influence material properties making them brittle and thus shortening the lifetime of the machine parts.

INTRODUCTION TO MARKET

The machine defined will be placed at a central place within the community. Every family buys a battery and lamp. For this system a good sales promotion is needed. Also the system becomes cheaper with more participants. The benefit of the central-located system is that a local authority such as the village eldest or doctor can be used for the promotion. Being a member of the community this person can then focus people on the benefits and gain their trust to participate. With more people engaged in the project the mouth-to-mouth promotion will also increase. Furthermore the local media centre can be used. Here flyers and posters can be printed. For this technique to work people do need to have at least a lower understanding of letters and words.

3.2.5. SCENARIO TO CONCEPTS

From this final scenario and the earlier discussed system we started with a group brainstorm to come to a few concepts, eventually 3 were made which are shown here. The main differences in the concepts come from the movements used to generate power. This deviation leads to different physical strains. This criterion, in combination with the ease of use, has been the main points to evaluate the concepts. Furthermore the space needed and fragility of the design have been considered. Finally the position while pedaling influences the decision, since social interaction is such an important part of the project.

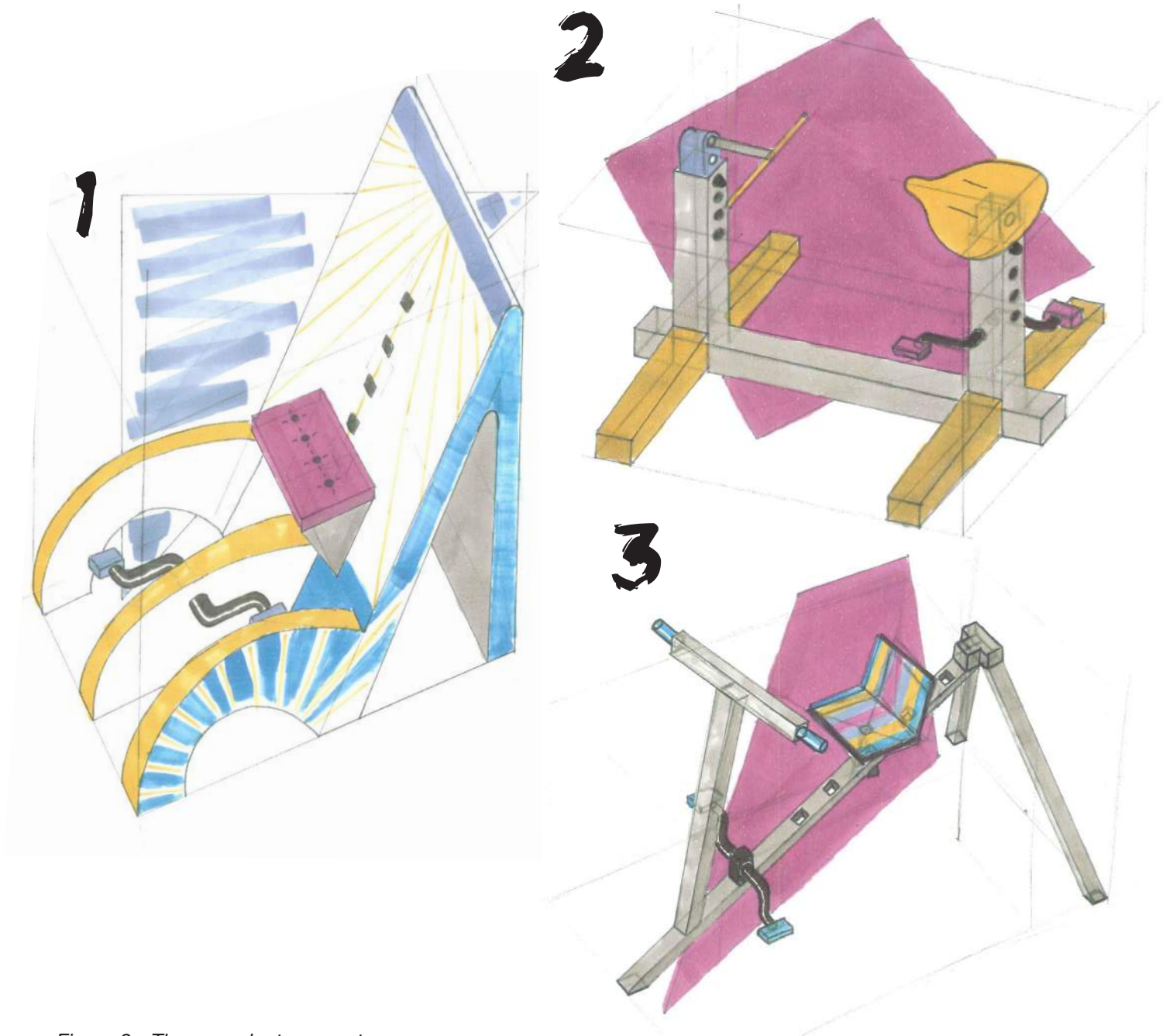


Figure 9 - Three product concepts.

With these criteria the concept number 3 has been chosen. This design enables people to chat while pedaling, uses the power of the leg, appeals to the image and use of a bike, and does not need much space. Also the wide legs can be placed over other objects and provide a good balance.

3.2.6. FINAL DESIGN

Important aspects of the final design are the adjustability in height and depth, stability, grips, involvement, ease of production, costs and flexibility in set up.

To adjust the debt and height of the seat a simple system will be used. The seat is placed on top of a bar. In the frame vertical holes are drilled. The bar then fits in these holes and the seat can be adjusted in height and depth.

Due to the wide range of users the complete machine needs to be stable. A possible option is to make it really heavy by adding weight at the bottom. This would costs much material increasing the price unnecessary. Instead the lower frame is really wide. This way the machine becomes really stable.



Figure 10 - Visualisation of the final design.

Due to the wide range of users the complete machine needs to be stable. A possible option is to make it really heavy by adding weight at the bottom. This would costs much material increasing the price unnecessary. Instead the lower frame is really wide. This way the machine becomes really stable. Furthermore the flexibility concerning the location is not being compormised. The machines can easily be turned to face each other or be placed in a circle in bigger groups

The machine is divided into the framework, pedals and the chair. The framework is made from steel and constructed in the local steel workshop. The seat is made from wood and then covered with fabric. The fabric can be decorated by local artists, to create cohesion with the slum the product will be placed in. Finally the pedals will be adjusted with wooden blocks. This way only a thin rod is used to direct the force and the pressure on the feet is minimized by enlarging the contact area. By using multiple materials all the workshops, and their employees, are used. This stimulates them to participate in the LED program and provides them with a salary. The different materials are the responsibility of the different workshops. This way when one part is broken the material indicates whom to contact.

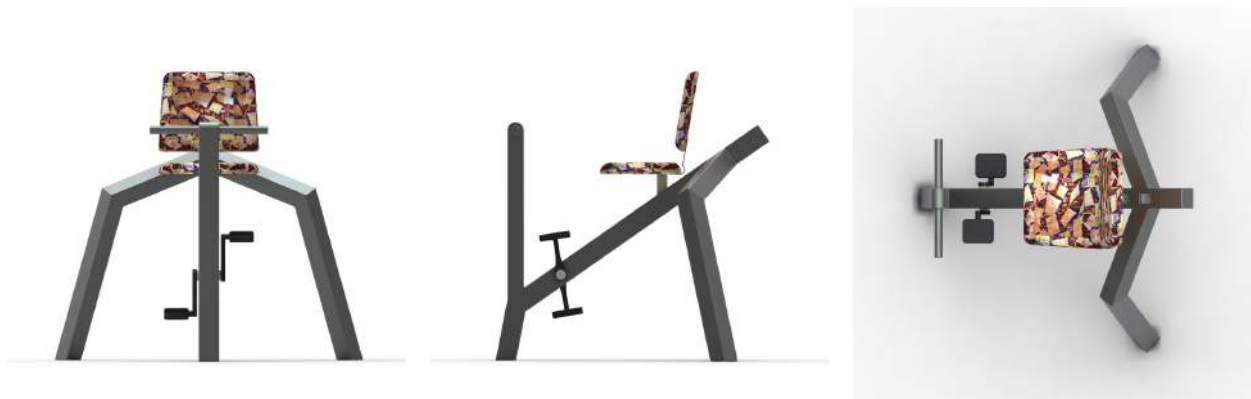


Figure 11 - Three views of the final design.

3.3. PHASE 3 - IMPLEMENTATION

In this final phase, we are looking at the implementation of our CIPS, we called it the Pedal Place, as described in our final scenario and with the design we have come up with. We are focussing on the steps to be taken to implement the system. Next, our business plan includes strategies

3.3.1. COMMUNITY INTRODUCTION

The CIPS has to be introduced into the community before the actual Pedal Place is created. They have to get familiar with the product in order to see the advantages. Therefore the first step is to get the attention of the community by advertizing through posters and speakers. Step two is hiring people for manufacturing at the three workshops. When the PedalPower's are produced and assembled they will be placed inside the community center and another person has to be hired for supervising the PedalPlace. Step three is giving a free battery and LED to the employees of the workshops and PedalPlace to create a social snowball-effect in which the owners of a lamp encourage the rest of the community to buy the product. Step four is demonstrating the advantages of the LED at a community meeting and schoolclass to inform the community. Step five is creating the possibility that everyone has the opportunity to buy a battery with a LED. This will be achieved by arranging a micro-credit agreement with the bank so that everyone can obtain a micro-credit for the purchase. Step 6 is selling the battery and LED and gaining customers which pay to pedal for energy.

We have come up with a list of social elements that are integrated in our CIPS. From these elements, the steps to be taken before introducing the CIPS to the community were extracted. Below are these steps listed, with the action to be taken and the people that are involved in each step.

Element	Action	People involved
1	Information about polluting gases in kerosene, comparison to LED-lighting, arrange a community meeting	Community center, Media center, school,
2	Demonstrate LED-light in darkness, play a boardgame	Community center, Local Authorities
3	Parents oblige children to pedal, school teaches children the advantages of responsibility, set up a competition between children	Families, School
4	Parents teach children to look after their relatives.	Families
5	Demonstrate LED-light in darkness, no smell of smoke from kerosene	Community center, local Authorities
6	Start up a radioshow in the evening, for young and old	Media Center
7	Show calculation of comparison, combine with action 1	School, Community Center, Bank

8	Social education by parents (make friends), also stimulated by school	Families, School
9	Show calculation of comparison, leftovers can be used for everything	School, Community Center, Bank
10	differences in hobbies, at the same time two activities in house	Families
11	Turn the light on, people will show up	Families
12	Give an example when battery is low	Community center
13	Two or more persons has to buy the LED, social pressure will start when seen in action	Community
14	Create a route via the waterbassin to PedalPlace	Local Authorities
15	Organize a cultural event	Community Center, Media Center
16	Mobilize/organize people	Local Authorities/Community Center
17	Display information on screen at Community Center	Community center
18	Build PedalPlace inside Community Center	Community center, Workshops
19	Create everything around the community center	Everyone
20	Create everything around the community center	Everyone
21	Select right person to run the PedalPlace	Local Authorities, Community Center, Bank
22	Hire people for managing the system	PedalPlace, Local Authorities, Community Center
23	Offer battery and LED at the PedalPlace	PedalPlace
24	Calculate what must be earned to create wealth and select amount of free coupons.	Bank, Community Center, PedalPlace
25	Appoint right people to check on PedalPlace	Local Authorities
26	Create credit at bank for financing micro-credit	Bank
27	Create transferpossibility	Bank

28	Designing framework, productionline	Steel workshop, PedalPlace
29	Design seat and accessoires	Wood workshop, PedalPlace
30	design cover and accessoires	Fabric atelier, PedalPlace
31	Hire people for design, production and maintainance	Local Authorities, PedalPlace
32	Obtain resources	PedalPlace
33	Create discount for employees	PedalPlace
34	Demonstrate LED-light in darkness	Community Center
35	Assign teachers, consult head of school.	Community Center, School
36	Inform children about new system	School
37	Create PedalPlace (production, marketing, sales, location)	Local Authorities, Community Center, Bank , PedalPlace
38	creativity	People
39	startup battery collecting firm	People
40	Two or more persons has to buy the LED, social pressure will start when seen in action	People
41	Demonstrate LED-light in darkness outside	Community center
42	Create commercials	Media Center
43	Demonstrate LED-light in darkness	Community Center
44	Start up a radioshow	Media Center

All these steps have to be taken into account when implementing our CIPS. To be able to do this, there should be a secure planning. Contact should be established with the people responsible for the workshops, school, community center and the media center. With all these people working with us and together, the cohesion of the village will increase through our service.

3.3.2. BUSINESS PLAN

BUSINESS OBJECTIVES

- Realize a market penetration of at least 90% within the first year in Bukawa.
- Investing in 52 stools in the first year.
- Setting up franchises in 25 neighboring communities.
- Expanding to other cities and other countries in the next 5 years.
- Realizing revenue of \$50,000 a year within the next 10 years.
- Having a market share of at least 60% in LED-services in Slum Communities in which we operate (through franchise or through ourselves).

DESCRIPTION OF PRODUCTS AND SERVICES

LED-LAMP

The LED-lamp is a product which we distribute to the community members to provide them lighting. It is a hazardless way of lighting up the community. It works with the battery.

BATTERY

This battery can be recharged at our Pedal Place, we distribute this battery together with the LED-lamp which it powers.

PEDAL STOOL

This product is made by the workshops and is able to recharge the battery which in turn powers the LED-lamp.

PEDAL PLACE

This is the service which is most vital for our company; the products previously mentioned are solemnly created to provide this service. The service we provide is letting the community members recharge their batteries by pedaling for 15 minutes. This will cost only \$0.50 a time, which comes down to \$5,- a month for a typical family in Bukawa. This price is competitive because the alternative kerosene lighting costs \$8,- a month and the switching costs are negligible.

ORGANIZATION AND MANAGEMENT

SOCIAL ENTREPRENEURIAL DESIGN GROUP

Nane is a so called Social Entrepreneurial Design Group (SEDG), by design and social entrepreneurship we try to bring the community to a higher level of social wellbeing. Five enthusiastic community members have started this group and are running it daily. At the moment of writing we are busy with the implementation of our first Community Integrated Product System (CIPS) the Pedal Place.

PEDAL PLACE EMPLOYEES

At the Pedal Place one or two employees will take shifts in turns to man occupy the counter at which one can pay to charge their battery. These employees will stand directly under the supervision of one of the SEDG. Like ourselves they get paid approximately \$2 a day.

PEDAL PLACE FRANCHISES

Once we have successfully implemented the Pedal Place in our own community we will look for Entrepreneurs that are interested in starting a new Pedal Place in their community. We will provide them with two stools per 40 families, enough batteries and lamps to supply their community. In order to get this deal they will have to pay us \$50 a month. When this entrepreneur is able to get 30 families to use

the lights he will make \$200,- a month, so he still has \$150,- a month for himself which is 5\$ a day. They will have to pay for their own promotions.

MARKETING AND SALES STRATEGY

MARKET SEGMENTATION

The market segmentation is hard to describe in this community, because the target market is the community as a whole. We want everybody to have the benefit of health-hazardless lightning. The advantage of this product is that the benefit is clear; furthermore the initial target market only consists of 40 families.

Positioning statement:

'Nane's lighting provides hazardless cheaper lighting to the BOP'

Value proposition:

Target market: Bottom of the pyramid, inhabitants of Slums.

Benefits offered: Hazardless cheaper lighting

Price range: 25% below the cost of kerosene lighting, from an average of \$ 8,- to \$6,- per month

The inhabitants of Bukawa and similar slumps have to see the Pedal Place lighting service as an obvious improvement, in the field of health, cost and light emission, from kerosene lighting.

Once we have successfully provided Bukawa with lighting and it has become a success we will apply for a loan to produce another 50 stools which will be franchised to entrepreneurs in neighboring slumps. The difficulty here is to cross the gap, also known as the 'chasm', between the early adopters and the early majority. We expect little trouble with getting our own community to use the Pedal Place, however to expand to other communities we will need a beachhead, which is a segment that is connected to other target groups that will help us cross this chasm. In order to do this we have chosen other Entrepreneurs which have connections in other communities. They get the sets of lamps + batteries in order to supply these to their community and implement the same system we have proven to work in Bukawa.

PRODUCT STRATEGY

The most important aspect of this product is not the hard features, but the value addition to the community's social cohesion. It is therefore that we have worked towards a product that fully embeds this aspect. A product consists of three levels; the core product, the actual product and the augmented product. The core product describes the need that the whole product fulfills. It is the benefit you perceive when using or buying the product. In this case this is the need for a healthier alternative to lighting, which does not cost more. The battery powered LED-lamp fulfills this need.

The actual product is however not the LED-lamp, it is the service of charging your battery to be able to use this LED-lamp.

Nane should position the service as an easy and affordable alternative to kerosene lighting.

The augmented product describes the non-physical part of the product and can consist of things like financing, service, installing, warranties, delivering etc. Financing is probably the most important aspect of the augmented product. Money is a problem for this target group, and then especially the initial investment that has to be coughed up. This is approximately 10x the day-salary of one family. This might not seem much; however these 2 dollars a day are just enough to pay for basic needs like water and food. Therefore the batteries and LED-lamps will be provided for free to the community. Nane will apply for a loan to not only pay for the stools but also for 40 batteries and lamps. This way the inhabitants don't have to worry about financing. Repair services will be geared towards the Stools which should be easily repairable. We expect the LED-lamp and batteries not to break down much in the first five years, so we



will provide the service of a new LED-lamp and/or battery once it breaks down. The other aspects like installing, warranties, delivering etc. are not important for the LED-lamps and batteries because the area is very small.

PRICING STRATEGY

There are three aspects that have to be considered in order to come to a right pricing strategy; costs, competition and customers.

Costs

We estimate the production costs of one machine at approximately \$130,-. But the highest costs are the salaries of the personnel and the lamps + batteries. These costs however are not fixed costs and will only grow when more service needs to be provided. This makes the total of these variable costs less paramount to the (financial) success of this service.

Customers

The second factor which has to be taken into account is the target group. As mentioned earlier they do not have a lot of money so it is key to keep the price below what they are now paying for their lighting. The budget they spend at the moment is approximately \$8,- a month on Kerosene lighting.

Competition

Competition is the third factor. The only real competition is Kerosene lighting. We will have to be cheaper than that because the switching costs will then be negligible for our target group.

Taken these three factors into account we will price a single recharge at \$0.50. This would add up to approximately \$5 a month instead of the \$8 they are charged for Kerosene lighting.

PROMOTION STRATEGY

When branding our new CIPS, our focus is not on promoting our CIPS as a product, but on selling the service: the complete package of our service and the product. Since our CIPS is based on a central place where the Power Pedal Stools are located, we decided to call our service 'Pedal Place'. With this universal name, a branding name is found, that can be integrated in the daily vocabulary of the slum people. "Are you coming to the Pedal Place this afternoon?" will be a common phrase heard in our Setting X. Local franchises of our Pedal Place concept can add their slum name for some extra bonding with their respective settings, for instance 'Pedal Place Bukawa' in our setting.



Figure 12 - Pedal Place logo.

The logo for the Pedal Place is, like our own Nane logo, inspired by African art. The Pedal Place is visually represented by a circle, with small dots in it that represent the different people using the Pedal Place. The smaller dots are of lighter color, because of the light the Pedal Place brings to the slum villagers.

Most of the promotion will take place through existing channels, while cooperating with the people responsible for them. Radio commercials and printed media will be created at and with the media center, while we will lecture people at the community center and at schools. By using the channels that the local people are familiar with, a feeling of trust will be created.

DISTRIBUTION STRATEGY

In order to supply to our own little community Bukawa we will use the direct channel we set up at the community center. The people will be distributed with a battery and LED-lamp so that the whole community is provided with hazardless lighting. When they start using this lamp they will have to come to the community centre and pay a small fee in order to pay off the lamp, battery and the stool.

For the franchising strategy we will use ourselves as sales force to promote the system to other community entrepreneurs, who will then be provided with the same set (two pedal chairs and 40 lamps and 40 batteries / 40 families).

FINANCIAL MANAGEMENT

Before we tell you more about how we want to financially support our system we have to state that all these figures are based on assumptions and thus may not be correct. The level of detail is quite high which is in contrast to the level of knowledge we really have about these places and therefore might be quite inaccurate. We have chosen this level of detail because we found it interesting and after some playing the five scenarios were just a click away.

The basic idea is to first supply our own community with a pedal place, however the success of our project lies on the ability to franchise our concept to various other communities within a city like Johannesburg. This is visible in the Table 2 and Table 3. When we look at the cash flow for the coming 5 years without the ability to franchise, we can see that the total end balance is \$-2,296.36. This is with only the micro loan of \$1,000.-. However when we let the workshop produce 52 chairs a year, of which 2 are for our own community we can franchise the rest of the systems to 25 other communities of about 40 families. This would come down to an investment of \$48,200.- This seems like a lot, but in the following figures depreciation, interest and payback in 5 years has been computed. So producing 52 pedal chairs in one year and leasing these the following 4 years would generate us a profit of \$ 30,044.64, which we can then invest in new projects.

We however expect the market to be very large, with approximately a third of the total population living slums, and even 2/3ths in sub-Saharan africa1 we should easily be able in consecutive years to produce 10 machines a year. When we franchise these in the same way we franchised the chairs in the previously described scenario we will be able to generate a profit of \$41,388.32 with a loan of \$48,200.00.

To generate the highest profit we would have to make 52 pedal chairs in year 1, 2, 3 and 4. This would however require a loan of \$49,000.00 in the first year and a subsequent loan of 37,000.00 in the second year, which would generate a profit of \$89,141.78 to invest in new projects. This is in fact the best scenario because it would not only provide us with much liquidity to invest in new projects, but would also mean that we have provided 104 communities or 10400 people with not only hazardless lighting but also the social cohesion of our pedal place CIPS concept!

The fifth scenario is when we have produced 52 pedal chairs in the first year but can only franchise 25 of them in the second year. We will then not produce more in that year and expect to franchise another 15 in the third year and 10 in the fourth year. In the 4th year we will produce another 10 chairs which we will franchise in the consecutive year. This boils down to a total of 30 communities with a pedal place and a profit of \$ 7,782.38.

All the figures have been summarized in the cash flow graph on the next page for the first 5 years as well as in the tables below it. It is important to keep in mind that the profit we talk about at the end is pure

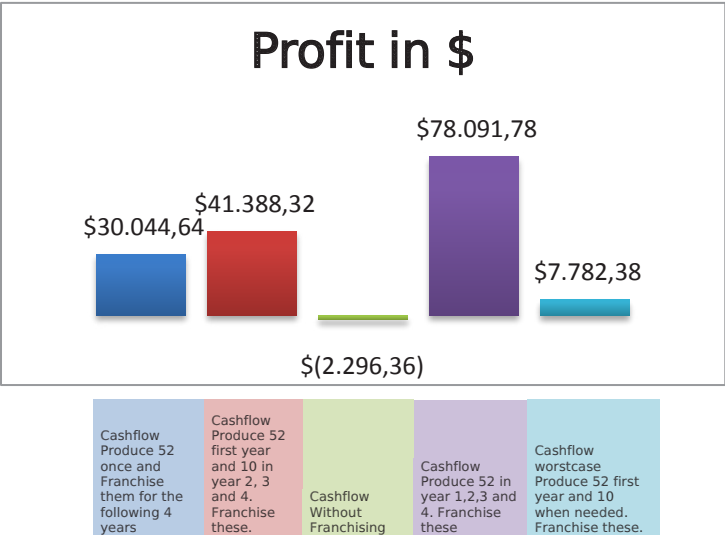


Figure 13 - Profit in the first 5 years.

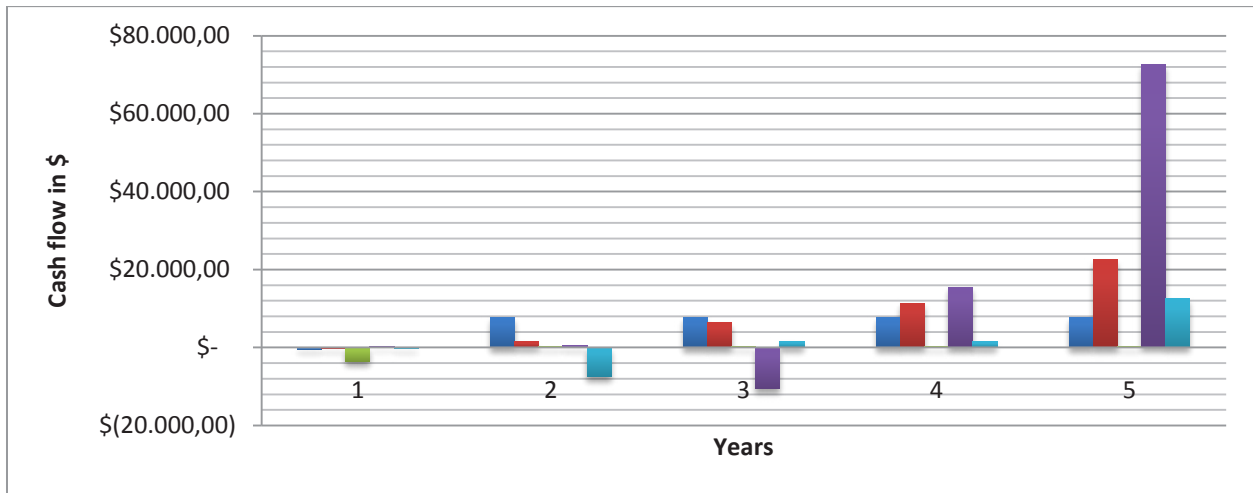


profit. The costs have been explained in table 1, and have been computed for every scenario in table 3. Eventually we expect to use either scenario 2 or 4, so either producing 52 in one year and 10 every subsequent year, or producing 52 in year 1, 2, 3 and 4. Or of course a scenario which lies between the two. Which one will be the case depends on the demand and how fast we are able to franchise the systems to other communities.

In contradiction to popular believe we think it is important to take the business side of this project very serious, and compute the figures and plan of a realistic project which is actually viable. We also realize that a loan of almost \$ 50,000.00 is quite a lot, but expect to be able to get this amount of money if we show the bank the figures that we have shown. If it is difficult to find an investor or bank who is willing to come up with this amount of money it is also possible to invest the savings we have ourselves, this will not only reduce the amount of debt but will also give the investor or bank the feeling that the project can be trusted because if it fails it will also be our loss.

Costs in year 1 – Table 1

	Amount	Price/Piece	Total	
Technology	1		\$ 50.00	
Steel (tubes)	1		\$ 35.00	
Steel (other)	10	\$ 0.67	\$ 6.73	
Wood (berk)	18.52	\$ 0.50	\$ 9.26	
Fabric	2	\$ 0.30	\$ 0.60	
Personnel	5	\$ 2.00	\$ 10.00	Cost of personnel producing one machine
		Subtotal	\$ 111.59	Cost of one pedal chair
		52	\$ 5,802.68	Cost of producing 52 pedal chairs
Service Employee	730	\$ 2.00	\$ 1,460.00	Salary of the service employee
Entrepreneurs Salary	1825	\$ 2.00	\$ 3,650.00	
Promotional Costs	1	\$ 300.00	\$ 300.00	Promotional costs, \$300 in the first year
	1	\$ 100.00	\$ 100.00	\$100 in every consecutive year.
Costs Lamps	1000	\$ 20.00	\$ 20,000.00	Investment costs of the lamps
Interest	0.1	\$ 47,200.00	\$ 4,720.00	Interest of 10% on loan
Depreciation	0.2	\$ 25,802.68	\$ 5,160.54	
Payback	0.2	\$ 47,200.00	\$ 9,440.00	Payback of loan in 5 years
			\$ 50,633.22	



Graph 1 – Cash flow in \$ per year

Year	Cashflow Produce 52 once and Franchise them for the following 4 years	Cashflow Produce 52 first year and 10 in year 2, 3 and 4. Franchise these.	Cashflow Without Franchising	Cashflow Produce 52 in year 1,2,3 and 4. Franchise these	Cashflow worstcase Produce 52 first year and 10 when needed. Franchise these.
1	\$ (473.22)	\$ (333.22)	\$ (3,637.82)	\$ 226.78	\$ (333.22)
2	\$ 7,629.46	\$ 1,430.38	\$ 335.36	\$ 416.25	\$ (7,430.54)
3	\$ 7,629.46	\$ 6,407.20	\$ 335.36	\$ (10,544.29)	\$ 1,569.46
4	\$ 7,629.46	\$ 11,384.02	\$ 335.36	\$ 15,495.18	\$ 1,430.38
5	\$ 7,629.46	\$ 22,499.92	\$ 335.36	\$ 72,497.86	\$ 12,546.28

Table 2 – Cash flow in \$ per year

Cashflow Produce 52 once and Franchise them for the following 4 years	Cashflow Produce 52 first year and 10 in year 2, 3 and 4. Franchise these.	Cashflow Without Franchising	Cashflow Produce 52 in year 1,2,3 and 4. Franchise these	Cashflow worstcase Produce 52 first year and 10 when needed. Franchise these.
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Costs

<i>Technology</i>	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00
<i>Steel (tubes)</i>	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00	\$ 35.00
<i>Steel (other)</i>	\$ 6.73	\$ 6.73	\$ 6.73	\$ 6.73	\$ 6.73
<i>Wood (berk)</i>	\$ 9.26	\$ 9.26	\$ 9.26	\$ 9.26	\$ 9.26
<i>Fabric</i>	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60
<i>Personnel</i>	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00
<i>Subtotal</i>					
<i>Chair</i>	\$ 111.59	\$ 111.59	\$ 111.59	111.59	\$ 111.59
<i>x amount</i>	\$ 5,802.68	\$ 9,150.38	\$ 223.18	\$ 23,210.72	\$ 6,918.58

<i>Service</i>	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00
<i>Employee</i>	\$ 18,250.00	\$ 18,250.00	\$ 3,650.00	\$ 18,250.00	\$ 18,250.00
<i>Entrepreneurs Salary</i>					
<i>Promotional</i>	\$ 300.00	\$ 300.00	\$ 300.00	\$ 300.00	\$ 300.00
<i>Costs</i>	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	
<i>Costs Lamps</i>	\$ 20,000.00	\$ 32,000.00	\$ 800.00	\$ 80,000.00	\$ 24,000.00
<i>Interest</i>	\$ 24,000.00	\$ 24,100.00	\$ 500.00	\$ 39,300.00	\$ 24,100.00
<i>Depreciation</i>	\$ 25,802.68	\$ 35,011.30	\$ 1,023.18	\$ 72,247.50	\$ 27,849.04
<i>Payback</i>	\$ 48,000.00	\$ 48,200.00	\$ 1,000.00	\$ 49,000.00	\$ 48,200.00
				\$ 37,000.00	
	\$ 149,955.36	\$ 174,811.68	\$ 15,296.36	\$ 327,108.22	\$ 157,417.62

Revenue

<i>Use</i>	\$ 300.00	\$ 300.00	\$ 300.00	\$ 300.00	\$ 300.00
<i>Subtotal 40 Families</i>	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00	\$ 12,000.00
<i>Franchise</i>	\$ 120,000.00	\$ 156,000.00		\$ 307,200.00	\$ 105,000.00
<i>Loan</i>	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00
	\$ 47,000.00	\$ 47,200.00		\$ 48,000.00	\$ 47,200.00
				\$ 37,000.00	
	\$ 180,000.00	\$ 216,200.00	\$ 13,000.00	\$ 405,200.00	\$ 165,200.00
Total	\$ 30,044.64	\$ 41,388.32	\$ (2,296.36)	\$ 78,091.78	\$ 7,782.38

Table 3 – Costs and revenue total of first 5 years.

3.3.3. FEASABILITY STUDY

Before we are able to start our business, we first have to conduct a feasibility study with the \$1000 micro credit that has been granted to us. In this chapter, we will discuss how we will prototype the product and how our budget will be allocated. When the initial project will be successful, the plan described in the chapter before can come into effect.

PROTOTYPING

Before the whole plan could start, a prototype has to be built by the locals. This prototype has to be built to see if there are problems caused by the design or the possibilities in the slum. Namely, when the real production starts, the locals have to build the whole peddle power machine.

First there is material needed so we have to make contact with steel and wood companies for the materials. The first time we order, we will go ourselves so we can see what the quality of the material is. If the material good enough is, we can decide to cooperate with the factories so we can take the advantages of economies of scale when the whole production starts.

After this, we have to explain the design to the wood and steelworker. This will take much time but that is necessary to make the design clear so we don't have to build another prototype. If the parts are ready, the assembly has to be made and then the peddle power machine will be tested. After the test, we can conclude if the design is good or if it needs some changes.

STEPS

- Search for good material
- Bring material to workers
- Explain the design
- Check of the workers work well
- Test design
- Decide to change the design or not
- Make appointments with factory about prices and delivery

MICRO CREDIT ALLOCATION

In the first year only the Service Employee salary would increase further and another 20 lamps will be purchased and distributed. This comes down to total costs of \$ 2,094.77.

The profit in one year is \$2,400.- and so the breakeven point of the first micro loan of \$1000,- lies after 299 days.

This does take in account that we as SEDG will not be provided with income from this project after two weeks. We will keep working on this project but then to franchise new CIPS which to other communities, as later described this will require a loan of another \$47,200.00 but after 5 years provides us with a profit of \$41,388.32 from the total project.

For an overview, see the table on the next page.

<i>Costs</i>			
	Amount	Price/Piece	Total
Technology	1		\$ 50.00
Steel (tubes)	1		\$ 35.00
Steel (other)	10	\$ 0.67	\$ 6.73
Wood (berk)	18.52	\$ 0.50	\$ 9.26
Fabric	2	\$ 0.30	\$ 0.60
Personnel	5	\$ 2.00	\$ 10.00
		SubTotal	\$ 111.59
			\$ 334.77
		2X1.5	
Service Employee	14	\$ 2.00	\$ 28.00
Entrepreneurs Salary	35	\$ 2.00	\$ 70.00
Promotional Costs	0.1	\$ 300.00	\$ 30.00
	1	\$ 100.00	\$ 100.00
Costs Lamps	20	\$ 20.00	\$ 400.00
			\$ 992.77

Table 1 – Costs of first two weeks

3.3.4. UPSCALING

With the high potential of the LED lighting it is very well possible to export the concept to other slum areas. Due to the personal contacts in the slum area it is advisable to export the concept to other SEDGs in other slums. Apart from the pedal power machine, the social concept and placement in a central room should also be communicated. The gatherings at the community centre, the evenings spent together and the money saved on conventional lighting, all contribute to the social cohesion of the slum and form a fundamental part of the concept.

With other SEDGs coming to new slums more people will profit from the benefits of the healthy and cheap LED lighting. People living along the 'borders' of our slum will gossip and with word of mouth more people will become interested. Not every slum will have a radio station broadcasting, but other slums areas will listen to it. This media can also be used for cross border promotion.

Apart from cross border communication, the main promotion will still be done locally. Possibilities then are the school, shops and central places such as the water basin or community centre. With local communication the trust can be kept. Furthermore there is more control on the implementation and future development.

By franchising the product name the scale of the product can greatly be increased. With franchising both the product name and knowledge are sold to a new location. Both organizations then comply to a corporation in which the old company teach the new location how to implement the concept. The new location is on the one hand supervised but on the other hand autonomous.

During the initial period in the original slum area the SEDG will not earn much money. With every franchise a fixed amount of money is paid to the franchisor. Also as many pedal power machines as possible will be produced in slum setting X. New franchisees will also need to pay for the use of these machines.

3.4. MODULE CONCLUSION

The goal of this case was to create a Community Integrated Product System for our slum called Bukawa. This is a poorly developed community which uses kerosene for lighting. Our mission is to replace the kerosene lights by LED-lights based on the Pedal Power machines. Another task in this assignment is to enhance to social cohesion in the community with the Pedal Power.

The Pedal Power is located at a central place which is accesible for everyone in the community. There are multiple Pedal Power's in a room which creates face to face contact while charging your battery. It's a place in town where people will stay longer than necessary because of the social interaction. Because of the mulitple Pedal Power's it's possible to help one another with pedalling or for children to have a competition in who charges the fastest, this way social capital is strongly created. Because of it's central location people often walk by and have a chat with the people who are waiting in line or already pedalling. The Pedal Power's are produced locally by the workshops, frame at the steelworkshop, pedals and seat at the woodworkshop and the covers at the atelier. Since the system is locally produced and decorated by local artest it creates a sense of belonging in the community. Therefore the villagers are very grateful and the workers get a lot of respect. To involve everybody there's a radiobroadcast in the evening which is provided by the led-lighting to inform everybody about the new development. The children will be taught about the led-lighting at school by assigned people in the community so they can inform their parents about the benefits of the system.

4. MODULE 2

GARBAGE COLLECTING SYSTEM

BARRELS



The second project concerns garbage collecting. Garbage can be used for many purposes and taking it from the street will improve the living conditions of inhabitants. The collecting barrels are used to bring garbage to the sorting centre and produce new products such as bags and fertilizer from it. The bags are then sold to the Bijenkorf, making enough money to balance all other costs.

4.1. PHASE 1 - IDENTIFICATION

In the first phase, we will look at the case of a garbage collecting system and identify different opportunities.

4.1.1. CASE ANALYSIS - CONCEPT IDEA

HOW DOES IT WORK?

Because not much technically advanced systems or methods will be used, production is easy and locally. The cart or carrier must be small and agile for navigating through the slums. The cart/carrier has a handlebar which is for pushing or pulling the cart down the road and two sidehandles with which you can lift the cart when terrain is bad.

WHAT IS IT MADE OFF?

The product consists of several parts which are a framework, handlebars, wheels and a basket. The dimensions are not yet defined which gives a great freedom in design. The other product will consist of a frame and an outter body. All the materials that will be used are producible in the local workshops such as steel, wood, fabrics etc.

The steel workshop will weld of mold the framework, handlebars and wheels. The wood workshop will produce the basket and the fabric atelier will produce tires and handlebar covers.

WHAT IS THE LIFECYCLE?

The lifecycle of the cart/carrier depends on the usage and maintainance during use. The minimum lifecycle has to be 5 years. But because of the garbage that will be carried/transported there's a possibility that the product gets dirty and start to rot. Therefore a regular maintainance time has to be set for each product for a longer lifespan.

HOW DO YOU USE IT?

As said before, the product is not yet fully defined and therefore not yet clear in use. There are several possibilities in usage such as: pulling the cart, pushing the cart and carrying the cart which all contain a cart with a storage room where the garbage can be thrown in. Driving the cart is possible with only one person, but when terrain is rough an extra person is needed to carry the cart which increases social cohesion. With an empty cart it's possible to carry it yourself and take it to the garbagebelt, there you can fill up your cart yourself or with another person and take it to the depot with another person.

FOR WHO IS IT?

The multiple possibilities in product form makes it difficult to set a clear value for whom it is produced. The carrier/cart can only be used by adults because it's too heavy for children and elderly. With this knowledge there are fewer boundaries for design such as weight, size and volume.

4.1.2. PERSONAL SCENARIOS - ELEMENTS

From different fields of opportunities we have come up with, multiple scenarios have been made. Each team member was allocated some locations in the slum. With these scenarios new ways for social interaction and possible product use could be discovered. These scenarios can be found in appendix B. Since many scenarios have an overlap the elements have been ordered according to location.

FAMILIES

- Families work together to earn a living
- Children are enthusiastic about the project
- Collecting garbage with your family
- Every family has its own collection device/unit
- Family brings device filled with garbage to central place
- Children can bring device to collection point
- Father gets paid to collect garbage from other people
- Parents can educate their children about garbage by making a game of the sorting
- Children can make a game out of the garbage collection

PARK

HOMES

COMMUNITY CENTRE

- People can make their bags in the community centre
- Employees needed for production and management
- Community centre rents 'cars' to collect garbage at a dump- field and at the street
- Community centre hires people to collect garbage from households. There will be payment for the garbage
- Project is started at the community centre

BUSINESSES

LOCAL AUTHORITIES

BANK

WORKSHOPS

- Tools are here available
- Work with the materials selected by the garbage sorting and pay for these materials.
- Workshop makes a promotion bag to increase awareness

SCHOOL

- Teach the kids how to create their own bag
- The bag kids use for school is a promotion for the project as well

NEW ENTERPRISE

ROAD

- Children in the street looking for garbage for own use
- Children produce handbags with the materials from the garbage they collected themselves
- Elderly collect garbage for the children in the streets



- Cleaner streets - garbage is disposed at fabric atelier

MEDIA CENTRE

- Radiobroadcast about collecting for someone else
- Media centre has more employees because of the promoting jobs Nane created for them

SUPERMARKET/SHOP

- Shop is used to sell tools for making bags, for example needles
- Shop will pay money if people return garbage and empty packages

WORK

- Provides work to overlook all people using tools to fabricate bags
- Provides jobs to produce bags and sell them
- Provides jobs to sort garbage

GARBAGE COLLECTING

- Own initiative
- Team bringing it to sorting centre
- The bag made during the workshop is used to collect new waste
- Slum is kept clean

MISCELLANEOUS

- Unique design - specific garbage needed
- Helping hand in the community
- Filtering of the dirt of the garbage with filters

WATER BASIN

- Some collection devices are places at strategic public places, like the water basin
- People come to collection place to sort their garbage
- By sorting their own garbage, people become aware of what they are consuming
- The water basin as a symbol for pollution and the need to improve the garbage handling
- Water basin can be used as the place to clean the materials

4.1.3. METHODOLOGY FOR EVALUATION AND INTEGRATION

As can be seen in the previous list, some of the areas are still empty. In order to create a CIPS which takes full advantage of all the elements of the community we took this in consideration when ordering the elements in the following 7 categories. These categories focus on the aspects of social cohesion, the CIPS and its workability and moneymaking for the SEDG and community. We came to these categories as a group; we started thinking about the problem that has been laid before us. We want to stress the three elements of social cohesion in this project even more than we did in the previous, therefore you will be able to see them return continuously. What we wanted to find out besides that is; Who collects the garbage, what CIPS features have we come up with from the elements list, how does the community make money, and last but not least, how do we make money? Not all listed elements are usefull and therefore only a few return in the matrix.

Aspect Social Cohesion	Aspects Concept	Aspects Funding
<div>Face to Face</div> <div>Social Capital</div> <div>Sense of Belonging</div>	<div>Who collects</div> <div>CIPS Features</div>	<div>How Community makes Money</div> <div>How SEDG makes Money</div>
<div>Parents can educate children about garbage by inventing games</div> <div>Cleaner streets since garbage is collected and re-used</div> <div>People make bags from garbage collected by themselves</div> <div>Children can make games out of garbage collecting</div> <div>Work together to earn a living</div> <div>By sorting their garbage people become aware of what they throw away</div> <div>People collect garbage in teams</div> <div>Teach children how to make bags at school</div> <div>Educate people in the creating of bags</div> <div>Educating people about garbage and materials</div>	<div>Children look in the streets for garbage</div> <div>Water from basin used to clean materials</div> <div>People look for garbage at the dumpfield</div> <div>Studio uses materials found from garbage sorting</div> <div>People can collect garbage for other people to use</div> <div>Collect money as a team for garbage</div> <div>Provides a job to look over people participating</div> <div>Radio broadcasting about collecting materials</div> <div>For an unique design, special material is needed</div>	<div>People get paid to collect garbage</div> <div>Sell bags to the Netherlands</div> <div>People get paid to hand in garbage</div> <div>Sell unused materials</div> <div>People collect household garbage (also form neighbors)</div> <div>Produce compost from green material</div> <div>People get paid to sort the garbage</div> <div>People get paid to produce bags</div>

Figure 14 - The matrix with CIPS elements.

After generating this matrix we got a better understanding of how we want the system to take shape, this is also what we have done next. Even before any specific product ideas have come to the surface we decided that it is important to us to have a clear understanding of the concept of the system, because from this and from the matrix above we can create the requirements and the final scenario of the product.

4.1.4. THE SYSTEM

As we can see from the scheme on the next page, you can see that Nane will once again be the center of the projects operations. Because waste is a problem, but also a valuable resource we have chosen to start a waste collection program. The community members can bring their waste to us after which we will evaluate it and pay them according to the value we see in the waste they brought. This should ideally keep the community much cleaner and create a greater social belonging, because the community members feel they can do something for their community while simultaneously generating capital.

This alone should keep the slum clean, we believe the community members to come to us and hand in their waste. This has been proven by the analogous system of deposits for PET-bottles in for instance the Netherlands. However, to guarantee enough waste which is needed to produce a continuous stream of bags to “the Bijenkorf”, we have chosen to also collect waste from the dump.

This systems starts with four employees which are on our payroll, we pay them a basic salary to collect the waste from the dump with a product we have designed and provided to them. In order to motivate them to collect the waste which is valuable to us we will insert a so called Performance Pay Plan or PPP. This PPP will say that they get a bonus once they collect valuable waste. This will be on top of their salary; however it will also have a minimum. So when they collect waste which has a value of x then they get their basic salary, they valuable waste they collect above that gets them more money. We believe this proven technique improves the efficiency of our employees.

The product has to be ‘operated’ with two community members needing and thus creating the face-to-face contact that is so valuable between them in order to earn their daily wage.

When we have enough waste we will put a couple of other employees on creating bags from the waste which is usable. The Kitchen and vegetable waste will be sold to the shop owner as compost. He will be able to create a vegetable garden from it and sell the products he grows. The vegetable garden would ideally lie close to the water basin for irrigation. Other waste will be sold to third parties who find a need in it. How the bags are produced can be found later in the report.

At the end of the cycle Nane will sell the bags to ‘The Bijenkorf’ which will sell it to customers all over the Netherlands. Because of this money will flow from the ‘North’, from the Netherlands, to the slum in a respectable way. This will increase the social capital because in the end there is more money in the slum and therefore there is more time to do other activities besides working.

Ideally the community members will feel a sense of belonging to the project because it is their waste that is used not only to make profit but to create a greater social wellbeing in the slum. They will soon feel the effects of a few dollars a day more going around the community.

Last but not least, to finance the project Nane will once again receive a loan of the local authorities.

In figure 2, a visualisation of the product system is given.

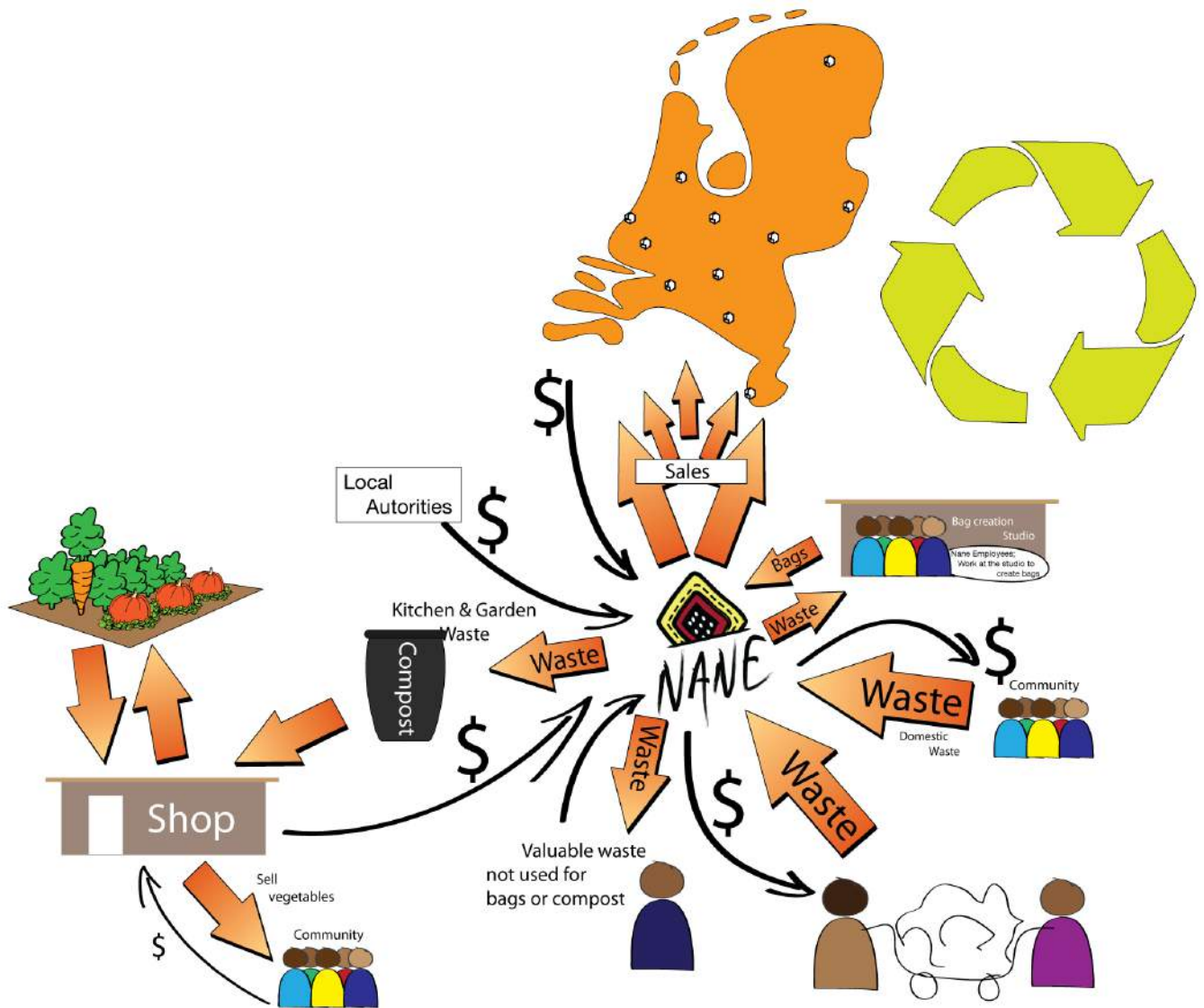


Figure 15 - A visualisation of the product system.

4.2. PHASE 2 - INTEGRATION

From the results of the previous phase, the system description and the matrix with different CIPS elements, we were able to create a final scenario, in which we describe the use of our system, and a list of product requirements. After that, we began developing concepts to choose our final design.

4.2.1 FINAL SCENARIO

Early in the morning Kobe wakes up as it becomes light. "Wake up my darling" he says to his wife Hamda. "I have to go to work and you have to bring the children to school" Kobe says. "Yes, I will do that, but will you make breakfast for me?" Hamda asks. "Okay, I will make breakfast for you, I'll see you in 10 minutes okay?" Kobe replies. Kobe went to the kitchen area to make breakfast while Hamda wakes up the children. Hamda calls the children, and Tobo and John are happy they can get out off bed. "We were already awake for an hour" Tobo says. "Oh now, you can have breakfast, because daddy is making it" Hamda says. "But first you have the dress up and clean your face" Hamda says. "I will go first" John screams. 15 minutes later the whole family is sitting at the table and Hamda asks what Kobe will be doing on his work today. "First I have to finish a bag which I started yesterday and after that, I will start drawing a new one, because I have a few exciting ideas" Kobe answered. "Is your boss happy with your design of the bag that's almost ready?" Tobo asks. "Yes he is, and he thinks that they can sell it for a good price" Kobe says. Half an hour later, Kobe kisses his wife and his two little boys goodbye and walks to the bag studio. Outside, he meets his neighbor and asks where Shanna is going to. "I have some empty bottles and boxes which I can hand in" Shanna says. "Oh, let me see if you can get some money for it" Kobe says. Shanna shows the stuff that she has. "Oh I think that this is very useful so they will pay you quite much. And maybe I will use it in my new design" Kobe says. "That would be funny" Shanna says. Then they arrive at the Bag-studio and Shanna goes to the pay-back desk. "See you later" Kobe says and Shanna waves and says "goodbye". Shanna hands the bottles and boxes in and gets 0,13 \$. She puts the money in her wallet and goes to the market to do the groceries.

Meanwhile Kobe is busy with his bag. Since he needs a zip he goes to the storage room. There is Pete working and Kobe says hello and asks if there is a zip. "What kind and what color do you need Kobe? I've got it all" Pete says with a smile. "I just received a new shipping so you can choose what you like". "I will take the small black one Pete" Kobe says. "Alright, take it with you my friend". Kobe goes back to his desk and Pete continues organizing and selecting. "Is it already finished Kobe?" Toto asks. Toto sits in front of him and also is a bag designer. "No, but I only have to sew the zip so I am almost done. How about you? Kobe replies. "No I just started a new bag. And the previous one has been sold for a good price! Did you hear that?" Toto says. "Yeah, the designers from NANE were very enthusiastic about it" Kobe says. Just before the lunch break Kobe finishes his bag. He delivers it to the designers from the SEDG NANE and after that, he goes outside to have lunch with his friends at the bag studio. When he arrives at the table, the other four designers are

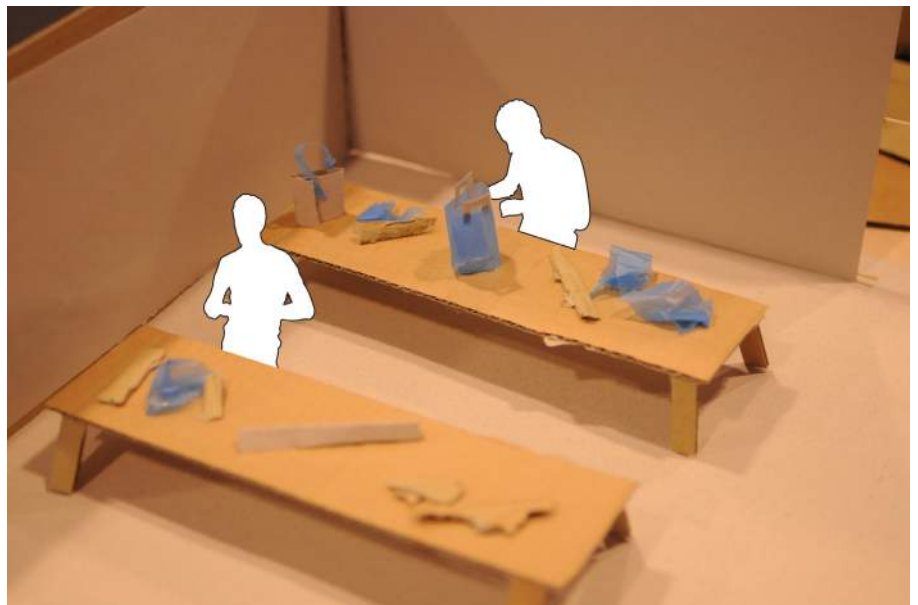


Figure 16 - People working in the bag workshop.

already sitting. One hour later, they all go back to work and Kobe starts drawing. At six o'clock Kobe leaves the bag studio and walks with his friends towards home. On the corner of the street Kobe goes left and says his friends goodbye. When he arrives at home, everybody is waiting for him in the kitchen. "I guess dinner is ready, right?" Kobe asks. "Yes so we can start eating now you are here." Hamda says. "And how was your day Tobo?" Kobe asks. "Very nice daddy! We played soccer and I had math and I was the best of the class." Tobo says excited. "Well done boy" Kobe says. "And tomorrow we will go to the bag studio the teacher said, so I will see you on your work" Tobo adds. "Yes I heard" says Kobe. "You'll get a short introduction from me and Toto. You know him right?" Kobe asks. Tobo nods and continues eating.



Figure 17 - The garbage collectors coming together.

While Kobe and Pete worked inside, Yoki worked outside all day. Yoki is a garbage men also working for the bag studio. Early in the morning he goes to the bag studio and meets his co-workers. Hadoe asks Yoki why he is so late and Yoki replies: "I am not late, you are here way too early." "Yes you are right" Hadoe answers and then Yoki explains: "My son is ill, so I stayed as long as I could with him. My wife Hapti quickly went to the market to do the groceries and when she returned, I came as fast as possible to the bag studio." "Okay, that is a good reason my friend" Hadoe says. "And if you need any help, my wife can always help you" he says laughingly. "Just kidding, you know I will be there for you

a n d your family" Hadoe says. "As are we" his other colleagues add. Then they all start to work and Yoki teams up with Hadoe. Today, they are responsible for collecting all the garbage in the slum. Therefore they take the garbage cart and Yoki pulls while Hadoe pushes the cart forward. While they cross the slum they have many chats with the villagers. Then Yoki sees Jop waving because Jop has a lot of garbage. "I see you almost have a mountain!" Hadoe says. "Yes I saved it for a few days because I was not here yesterday." Jop explains. "Let me see what you've got" Yoki says. Eventually Jop gets 0,67 cents for his garbage. Yoki and Hadoe organize it in the cart. When they come at a really narrow street, Yoki and Hadoe can't go further with the cart. They both take a barrel from the cart to put on their back. This way, they can get even in the tiniest passages. When there are done in the alley, Yoki and Hadoe walk back to the cart and place the barrels back. At 4 o'clock the cart is full and start heading back to the bag studio. They empty the cart and help Pete to sort the garbage. At half past 4 the co-workers came in and together they finish the job. 15 minutes later they all are finished and have a talk. Only Yoki and Hadoe immediately went home because of Yoki's sick son. When they get there, Hadoe has a small chat with Hapti. 20 Minutes later Hadoe goes to his own wife for dinner.



Figure 18 - Entering the small streets

At Hadoe's house, his son is waiting. Jaboe wants to tell his father about his first day of work. He works at the community garden project. There all the garbage, existing of rest of plants and fruits, is being saved. The compost is sold to people who need it for their own garden. Furthermore Jaboe uses it for the

community garden project. He gets a standard salary from the shop owner. The shop has the ability to do that because the shop can make a profit from the vegetables' sales. Jaboe than says to Hadoe: "I need to work hard, but I like it very well and I get my first salary." "That is good my boy and I hope you keep on working" Hadoe says. "Do you have any colleagues Jaboe?" Hadoe asks. "No, but sometimes someone of the shop comes across and I meet many people who need compost or have to take care of their own piece of garden." Jaboe answers. "Oh, look there is your mother, I think she was with the neighbors" Hadoe says. "I have dinner ready, my hard working boys" Hadi says with a smile.



Figure 19 - The community garden, with help of Nane compost.

4.2.2. LIST OF PRODUCT REQUIREMENTS

USAGE

The primary use of the cart is to temporarily store garbage during collecting. For this a cart will be made. The cart can, when necessary, be transported by two people by pushing and pulling. The original, empty, cart must be as light weighted as possible so that as much garbage as possible can be transported. Although the cart is meant to be used for garbage transport, other objects will also be transported with the cart. These materials could have a higher weight. This needs to be taken into account.

ADJUSTABILITY

Although the empty cart will be as light as possible a topped of f cart will have a significant weight. Furthermore since we work with employees, no child labor will be involved. With this, and local construction, in mind the cart will not be adjustable in any dimension.

PROTECTION FROM THEFT

In a really poor community all communal materials and objects need to be somehow locked in order to prevent people stealing it. The cart thus needs to be chained down with all elements lasting attached (e.g. by welding) or the cart must be placed inside.

MANEUVERABILITY

For the maneuverability firm handles will be used. This way the car can be pushed over humps, turned or lifted. Freedom of movement is very important as it forms a huge aspect of the ease of use and should therefore be well represented in any design.

DIMENSIONS

Since the cart has to be used in the slum area specific demands are made concerning the dimensions. The cart has to be small enough to be navigated through the narrow streets of the slum area. This means the cart cannot be too wide. Also the height has to be limited. In the slum area clotheslines need to be considered and a high stacked cart can easily become instable. The length of the car is restricted in combination with the revolution of the cart. In total small turns should be made possible with a maximum volume to enable as much as garbage to be taken in one go. The orbit of the cart can also be minimized when people can lift the car. This will mean that the car has handles and is light weighted.

Another important aspect of the dimensioning is that the cart needs to provide enough space to store a significant volume of garbage. Otherwise it is no longer profitable to have two people operating the cart. Furthermore the cart needs to beat the volume or mass two people can carry by hand.

Although the cart needs to be as big as possible storage will also need to be considered. Storage space can easily be minimized when the car can be folded or stacked.

MAINTENANCE

With the bad road quality and unintended use repairs must be taken into account. Structural repairs can be done by the workshops. Small repairs can be done by the employees of the centre. Since the carts are owned by the centre, the centre will pay for the repairs.

STORAGE OF GARBAGE

The cart enables the storing of the garbage and the transport back to the centre. At the centre the garbage is then sorted. If the cart facilitates some sorting device unnecessary double work is prevented. During placing garbage on the cart preliminary sorting can be done by the scavengers.

PRODUCTION

With so many possibilities in the workshops the cart will be produced in the slum. This provides additional

work and income for the workshops. Also the people working here have the best knowledge about the demands due to the surroundings.

WEATHER INFLUENCES

With the wide variety of slum locations, many weather influences need to be taken into account. Water, heat and UV light are the most apparent factors. Corrosion can easily influence the materials characteristics causing potential problems for the framework. Heat leads to requirements for the thermal conductivity of the materials used coming in contact with the body. UV light can, just as water, influence material properties making them brittle and thus shortening the lifetime of the machine parts.

INTRODUCTION TO MARKET

With a new centre opening in the community initial promotion will be easy. Furthermore the jobs provided by the centre will gain some interest. After the first interest people need to be educated. With important, well respected and well known locals the inhabitants will be informed about the benefits. Promotion is done by the production in the workshops for the cart, artists producing the first bags and more.

4.2.3. SCENARIO TO CONCEPTS

From this final scenario and the earlier discussed system we started with a group brainstorm to come to a few concepts, eventually 4 were made which are shown and described here. These concepts differ somewhat from the first case analysis, because as the project moved on we adjusted our view of the product and have broadened our brainstorm to other possibilities as well.

4.2.3.1. THE BASKET CONCEPT

This concept consists of multiple items. The employees can all strap on a basket. While the bridle is attached on one side of the basket, a hook is connected to the opposite side. This way the basket can be placed on the riding rack for the longer distances. Due to the different baskets an early shifting can be done for plastics, organic materials and other categories. The baskets are mainly made from empty drums. This firm material is very long lasting and tough. Smaller drums can be used for materials that are not that often found. The rack can be driven by just two people. When more people decide to go together more baskets can be placed on the rack and more garbage can be bought in.



Figure 20 - The basket concept

4.2.3.2. THE WHEELBARROW CONCEPT

The wheelbarrow concept is called the wheelbarrow concept because it resembles one very closely. In fact it is a wheelbarrow, the difference however is the size as well as the relative dimensions (it is deeper and more square to allow for more garbage to be transported). By two partitioning walls the wheelbarrow is divided in three different compartments to allow for the basic kind of garbage (usable, kitchen and gardening and other waste).

The third enhancement in comparison with the wheelbarrow is the fact that we have added two handles at the front of the barrow. Because of these handles the



Figure 21 - The wheelbarrow concept

barrow can be lifted with two people to get across very difficult terrain.

Advantages of this system are the maneuverability which is very high, with only one wheel the 'driver' can maneuver the barrow around tight corners and most of the difficult terrain. Furthermore the loading capacity is high, and it has to be operated by at least two people to get across the most difficult terrain. The last advantage is the big air wheel which has no problem with bumps or holes!

Disadvantages could be its stability but we believe that with two people and a little dexterity this should not form an actual problem.

4.2.3.3. THE CHEESE SHELF CONCEPT

The concept is based on the idea of the old Dutch cheese market. It should be operated in teams of two persons. The garbage is placed in garbage bag on a large wooden 'shelf'. A harness of metal or maybe a special fabric is attached to it. When someone needs to move it, he puts on the harness and lifts up the device. When the garbage is placed correctly, it should cause a lever effect: the device should be easy to lift. When arriving at a bad spot in the road where the device can't go further, the second person comes in. He can lift the device because of a special grip attached in the back. They can move now move further when the road is cleared. This situation can also be used in sharp corners.

When working with this device, most of the time one of the two persons operating it is very mobile. He or she can move around and ask people for garbage, can put everything in bags and can pay people for everything valuable they hand in. The other person, however, is pretty much attached to the device. It is therefore necessary that the harness is easily removable.

The device itself is made from wood on a steel frame and can be produced by the local workshops. Its main advantages are that it is robust and cheap to produce.

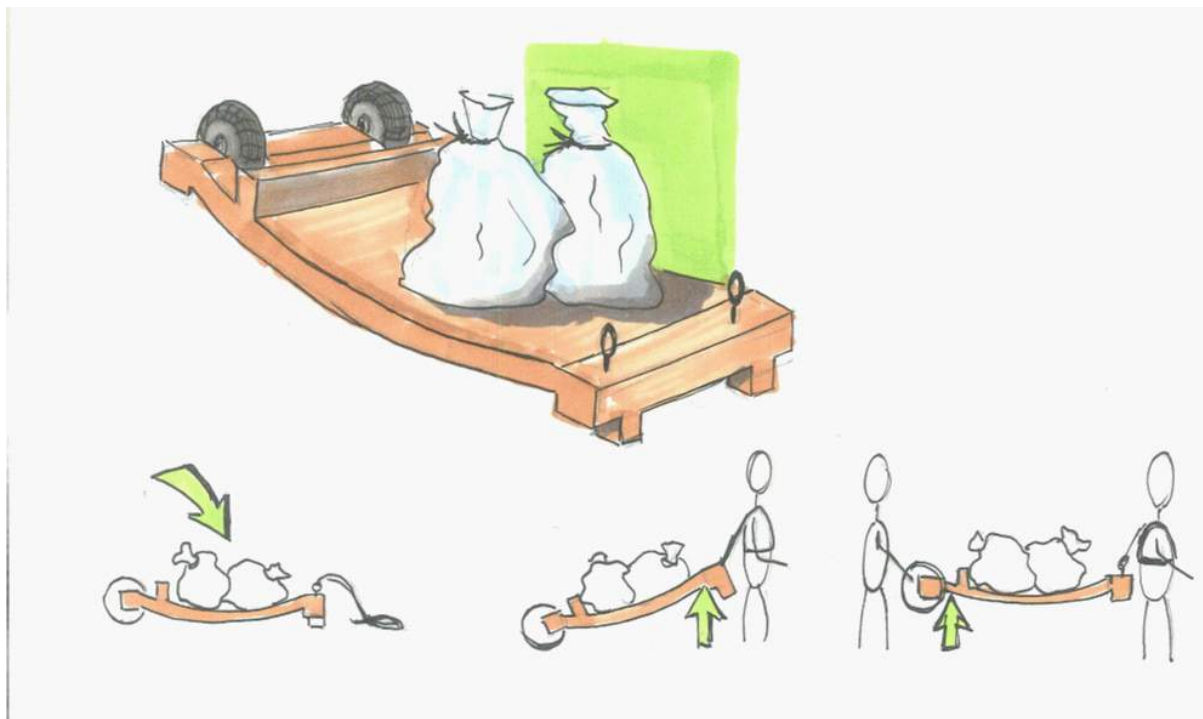


Figure 22 - The cheese shelf concept.

4.2.3.4. THE CART CONCEPT

This is a car that is used by two people. The advantage of this product is the hinge. Because of that, the car can be used in the narrow streets. Another advantage of the car are the handlebars. These bars can be used to lift the car over holes in the road. The bar in the front is needed to push the front side up and the bar at the rear end to push the backside down.

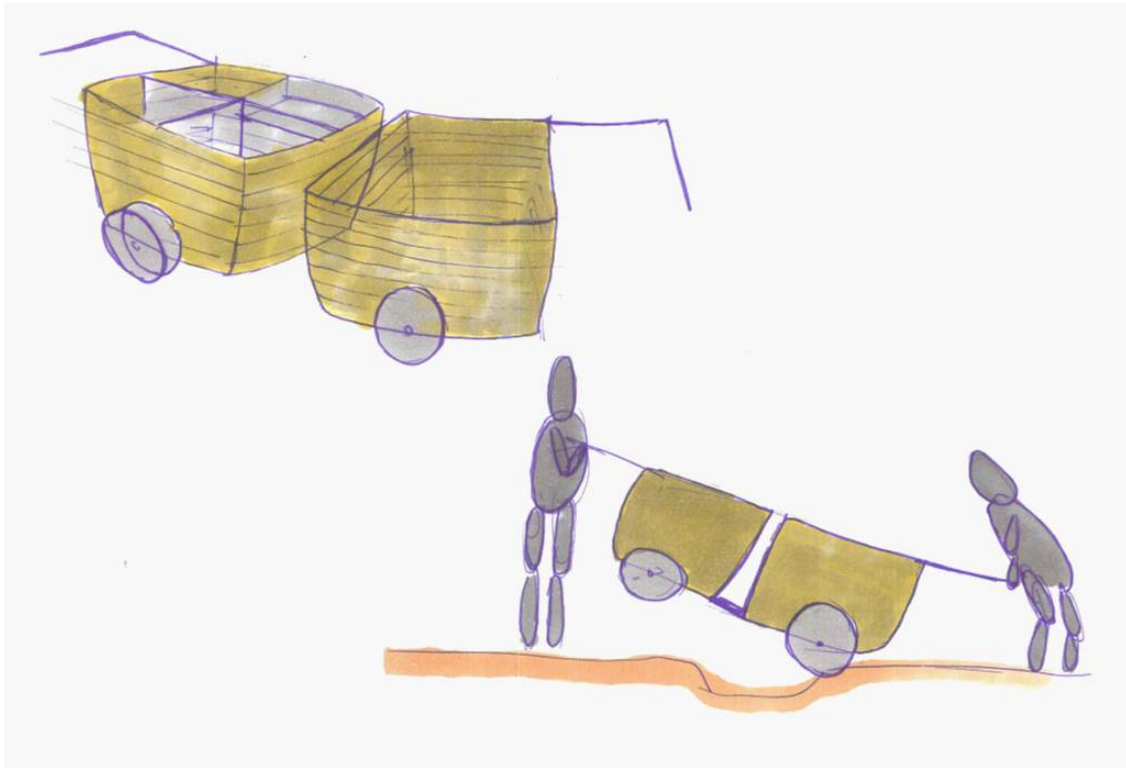


Figure 23 - The cart concept.

4.2.4. SELECTION OF CONCEPT THROUGH HARRIS-PROFILE

To evaluate the four remaining concepts a Harris Profile has been filled out. Important criteria were face to face, storage space and ease of use.

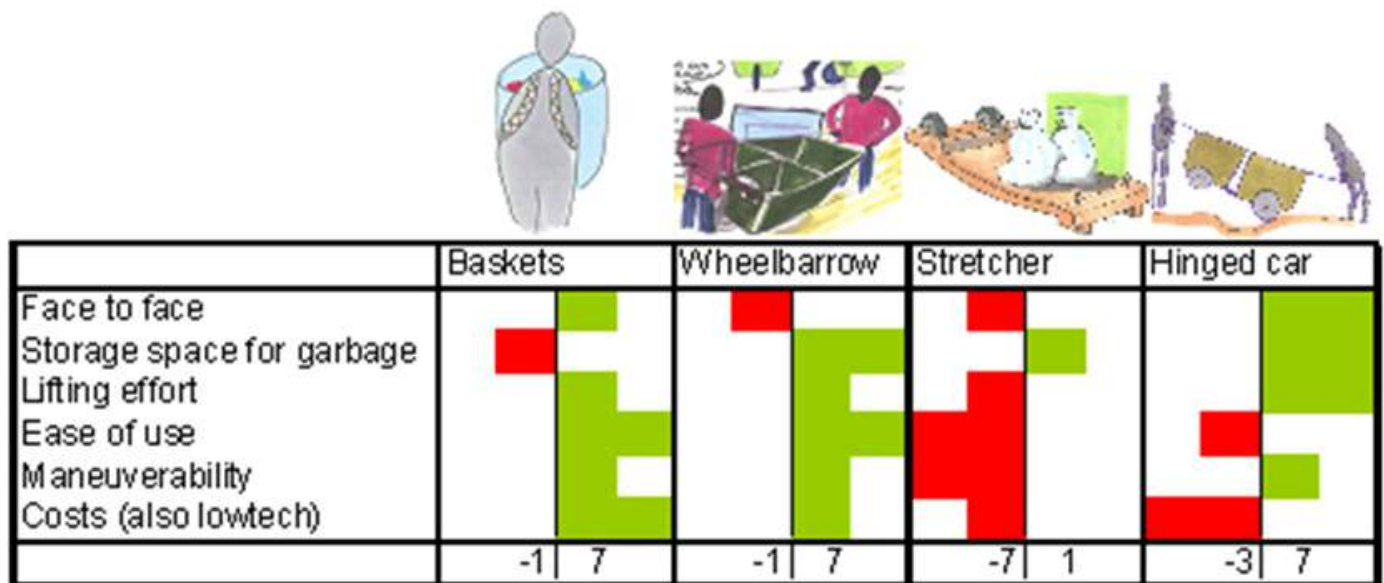


Figure 24 - Harris profile to select the best concept.

The basket concept and wheelbarrow have exact the same score. Due to the importance of face to face contact the basket concept has an advantage. Furthermore the basket concept score on the storage space can easily be upgraded. By enlarging the rack more baskets can be transported and the total storage space is increased.

4.2.5. FINAL DESIGN

The most important aspect of our design is its flexibility. When needed, it can be a compact cart fully loaded with garbage. When empty, it is a light construction that is flexible enough for use in small streets, but even if it is already loaded with some garbage, the most impassible areas of the slum can be reached by taking out the barrels that take up most of the space in the cart. People can load the barrels on their back and walk to the part of the slum they want to reach. When done, the garbage collectors can return to the cart with their barrel and load it there. This makes sure that every person in the whole slum can get its garbage collected, creating a cohesion with the person who comes to pick it up.



Figure 25 - Visualisation of the final design.

The frame of the cart is made from steel. It is produced at the local steel workshop, where we can follow the whole production process and give suggestions for improving the design and constructions to the local craftsmen. Because of its triangular shape, the cart is strong enough to carry the weight of the barrels, while being a stiff construction. With its pretty large wheels and rubber tires, the cart can ride on rough grounds.

The barrels are secondhand water barrels, which can be bought in the nearby city. They do not have to be edited much to be prepared for their future task, besides the drilling of some holes. With these holes, both hooks, to mount the barrels in the cart, and straps, with which people can lift the barrel on their back, are bolted to the barrel. To promote our image and to spread a feeling of community cohesion, the barrels are decorated by local artists.

Since there is room for up to three barrels, multiple persons can make use of the cart. When fully loaded, there are two people needed to push the cart around. This working in garbage teams improves the social cohesion among workers.



Figure 26 - Different view of the cart and barrels.



Figure 27 - Scene visualisation of the product.

4.3. PHASE 3 - IMPLEMENTATION

Guided by the final scenario the implementation for the CIPS is worked out. The Barrels design has been established and the general system is clear. For the implementation the system is most important, no matter how good the products is, without a well functioning system the cart is of no use.

4.3.1. COMMUNITY INTRODUCTION

To get the bag shop and sorting centre up and running multiple steps will be needed. Step one is to get the community activated for the concept of garbage collecting. Promotion can be done with help of the media centre for printing and broadcasting. Speeches can be given in the community centre and the information can be intertwined with the evening storytelling. The second step will be to have the workshop produce the carts and to buy and prepare the baskets. Thirdly employees need to be hired. The four people creating bags, the sorting manager and the four garbage collectors need to work together to produce the right, and selling, bags. The education of these employees will be step five. As a sixth step the produced bags will be sold and the remaining garbage will be taken care of.

In the next table all social elements that are integrated in our CIPS have been listed. Next to the element are the action and the people involved for the implementation.

Element	Action	People involved
1	Stimulate children going to school, get adults interested for a new job possibility	Families, school
2	Provide information to children through stories	School, Children
3	Families involve children in garbage saving	Families
4	Families need to be educated in the sorting of their own garbage	Families
5	Families need to be educated in the pricing of sorted garbage	Families
6	Parents teach children responsibility by having them bring the garbage to the centre	Children
7	People need to be educated about the value of garbage	Families
8	Playing a game	Families
9	Play a game as education	Children

Element	Action	People involved
10	Educate people about making bags	Community members, community centre
11	Hire employees	Community members, SEDG
12	Construct the cars	Workshop employees
13	Collect garbage from houses	Employees, community members
14	Interest people for new garbage concept and possible jobs	Community centre
15	Produce bags	Employees
16	Find usable materials for bag production	Sorting manager, bag producers
17	Make a promotion bag	Local artist
18	Teach children how to make bags	Children, school
19	Facilitate some people with (cheaper) bags for local promotion	Community members
20	Educate children about the value of garbage	Children, school
21	Educate children how bags are produced	Children, school, bag centre employees
22	Educate elderly about the value of garbage	Elderly, community centre
23	Educate people about the benefits of clean streets	Community members, community centre
24	Broadcast on radio	Media centre
25	Hire more employees for media centre	Media centre, community members
26	Sell tools through market	Market employees
27	Pay people for bringing in garbage	Market employees, community members

Element	Action	People involved
28	Hire someone as sorting centre manager	Community member
29	Hire people to produce bags	Community members
30	Hire people to collect garbage	Community members
31	Inform people about economical benefits to bring in garbage	Community members
32	Hire team of people to bring in garbage	Community members
33	Provide people with bags to collect garbage	Community members
34	Inform people about health benefits by bringing in garbage	Community members
35	Produce list of bag aspects that increase the value, and thus salary received	Bag/Sorting centre employees
36	Improve social cohesion in community	SEDG
37	Clean garbage material used for bags	Sorting manager
38	Educate people about differences garbage	Sorting centre
39	Stimulate mutual communication in slum	SEDG
40	Increase awareness of consumption	Sorting centre
41	Increase awareness effects of consumption	Sorting centre
42	Clean materials before use	Sorting centre employees

4.3.2. BUSINESS PLAN

4.3.2.1. BUSINESS OBJECTIVES

- Realize a significantly cleaner slum because of garbage pickup in the first year.
- Selling 1400 bags a year from the third year onward.
- Generating at least 10 jobs in the first year

4.3.2.2. DESCRIPTION OF PRODUCTS AND SERVICES

CART

The cart exists of a steel frame and wheels. In the front of the cart, there is a handle bar to steer and pull the cart trough the slum. At the horizontal bar there will hang four barrels, on each side two.

BARRELS

The barrels will be bought secondhand as they were used for oil. We want to give these barrels a new life by adapting them so people can hang them on their back. Furthermore, there will be a partition placed in the barrel to organize the garbage. A disadvantage of the barrels is that the empty weight already is nearly 10 kilos. This disadvantage is balanced by the rack where the barrels can be placed on most of the time. Even filled with plastics and the sort like, the barrels should not weigh more than government regulations approve off.

BAGS

Out of the garbage, the local designers make the bags. The bags differ a lot because we believe that if every bag is unique, the bags are more valuable. Eventually we will sell the bags to the “Bijenkorf” in The Netherlands.

The bags are being produced in the bag centre. 6 people work here fulltime. Each employee produces one bag each day. The materials used for the bags are partly bought in town. To establish the right quality parts such as zippers and needles need to be bought new. The remaining, and biggest, part of the materials comes from the garbage collecting system. All materials bought in by these people is sorted. Parts that can be used for the bags are cleaned and stacked. People creating bags sketch simple design outlines and collect the right materials from the stacks. Next they start to work on their bags and this routine continues each day.

Possible designs can consist of empty cans, soda bottle tops, plastic, empty bottles or jerry cans or more. Some alternatives:



Figure 28 - Possible bag designs.

SYSTEM

With the products; the cart and barrels, we set up a system. We hire people to collect garbage in the slum from door to door. Some other people will collect garbage at the garbage field. This material is brought to the bag shop. All the useful material is used to design bags. Other material is sold to companies who used these materials for recycling.

4.3.2.3. ORGANIZATION AND MANAGEMENT

Nane is responsible for the quality check of the bags as well as the export. We Will find a strategic partner cooperation in our country that can help us with the export. This seems easier than it is as this cooperation has to have good connections in our own country as well as in the Netherlands with the KBB (Royal Bijenkorf Management) His knowledge of the system will save us lot of work, enabling us to focus on the slum. Export from our country and import to the Netherlands are quite difficult to set up and some costs have to be accounted for. We sell the bags to a local strategic partner for approximately \$ 5 dollars a bag, twice a year. He will then FOB (Free on Board) Durban the goods, which means that this strategic partner will pay all the expenses to get the goods on board of a ship at Durban. To cover these expenses this partner should be able to sell the bags to the Bijenkorf for approximately \$ 7,50. With a factor 4 margin, known for the Bijenkorf to use, the final price would be \$ 30 dollars.

The organisation of Barrels is under supervision of Nane. We hire 10 employees of which 4 are going to collect garbage and 6 people working at the bag workshop, either sorting the garbage or designing and creating the bags. These employees all earn approximately \$ 2 dollars a day. 2 carts will need to be produced at the local workshop. This will be a one time expense.

4.3.2.4 MARKETING AND SALES STRATEGY

For the marketing and sales strategy the focus will be on the Netherlands. The cart and baskets will only be sold once to the sorting centre and thus is irrelevant.

MARKET SEGMENTATION

The segment aimed at consists of fairly wealthy women. Due to the colorful materials the bag will not often be used and thus the bag becomes a fairly expensive product. By buying the bag one automatically supports the poor, which probably is an important motivation for buying the bag in the first place. The bags have such a price that the middleman and producers all have a fair income. The initial target market thus consists of women who want a bag and think that a bag is worth more if other, less fortunate people, benefit from that action.

Positioning statement:

'Nane's bags provide wealthy women with an easy option to benefit themselves while improving a small part of the world.

Value proposition:

Target market: Wealthy, Dutch females who are able and willing to buy a product for their own, and other peoples' benefit

Benefits offered: An easy means to do 'good' to the world by improving the cash-flow in slum areas

Price range: Similar to other simple bags, which lack the benefits offered

PRODUCT STRATEGY

The core product is the bag but also the good feeling women get when buying it, since part of the money is being used to improve poor people's life. The need that the bag fulfills is to bundle possessions and in the meantime help poor people without becoming philanthropic. This is the benefit perceived when



buying or using the product.

The actual product is the bag. This is what is being produced and what people pay for.

The last part of the product is the augmented product. This describes the non-physical features of the product. Important aspects are quality checks, warranties and services and financing. The quality will be warranted at the producing centre. Some parts, such as zippers, will be bought in town. Furthermore the employees will be educated about the needs of the customers and the requirements to sell a bag. Next to the quality checks of course the usual consumer product warranties will apply to the bag. Services included are the selling at 'de Bijenkorf' and the services coming with that.

PRICING STRATEGY

There are three aspects that have to be considered in order to come to a right pricing strategy; costs, competition and customers.

Costs:

To cut even with the costs a bag should bring up about 5 dollars. With a middleman this price will soon increase. Important factors for the final price are the transport costs, personnel and shop rent.

Customers:

Next to the costs the target group needs to be taken into account. These people have enough money but need some 'excuse' to spend it. Buying the bags has two benefits. Firstly the women support less fortunate people without any personal inconvenience. Secondly the customer has a nice new bag to use.

Competition:

There is not much direct competition since there are not many bags produced from garbage in projects that are beneficial for the local producers. However there are more products that apply the same principle of a first world quality product with an economical benefit for the local producers, or another non-profit goal.

With these factors taken into account the final bag will cost 30 dollars, or 25 euro's. This way all parties in the production chain can earn a (fair) living.

PROMOTION STRATEGY

Important for the success of the complete system is that the bags are being sold in a first world country; this is because the bags provide most of the income for the system. This money is needed to pay for all the investments and employees. After an exporter and final shop has been found and contact has been established our influence on the promotion will stop. Further promotion is mainly done by the final shop. All bags will have a tag with the logo and a short description of the project system.



Figure 29 - 'Barrels' logo.

The logo clearly states the name of the system, Barrels. The font is similar to that of our SEDG logo and former projects, such as the pedal power place. This enlarges the branding image and makes future promotion easier. The logo also includes a barrel with an abstract imaging of a local artist. This illustrates

the connection between the SEDG and the locals. Furthermore the name 'barrels' brings another focus to the mind than a name referring to garbage or scrap.

The logo also helps with the social cohesion aspect 'sense of belonging' when the employees and the rest of the community see this logo they should be excited about it and think of the good it brings to the community.

DISTRIBUTION STRATEGY

Distribution will be done by the distributor and final shop. Existing channels can be used and do not need to be discussed here.

4.3.2.5. FINANCIAL MANAGEMENT

First five years

The first few months we will make a little loss, at the end of the 5th month the project will break even. Presuming we will sell all 2500 bags every year as well as the compost, a profit of \$10,920.00 is generated. (see the graph on the next page).

Costs			Year 1	Year 2	Year 3	Year 4	Year 5
	Amount	Price/Piece	Total				
Oil barrels	4	\$ 5.00	\$ 20.00				
Steel (tubes)	1	\$ 35.00	\$ 35.00				
Personnel	5	\$ 2.00	\$ 10.00				
		SubTotal	\$ 65.00				
Employees	3650	\$ 2.00	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00	\$ 7,300.00
Entrepreneurs Salary	1825	\$ 2.00	\$ 3,650.00	\$ 3,650.00	\$ 3,650.00	\$ 3,650.00	\$ 3,650.00
Promotional Costs	1	\$ 300.00	\$ 300.00	\$ 100.00	\$ 100.00	\$ 100.00	\$ 100.00
Depreciation	1	\$ 13.00	\$ 13.00	\$ 13.00	\$ 13.00	\$ 13.00	\$ 13.00
Costs Garbage	2500	\$ 0.20	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00
Payback	1	\$ 200.00	\$ 200.00	\$ 200.00	\$ 200.00	\$ 200.00	\$ 200.00
Interest	10%	1000	100	\$ 100.00	\$ 100.00	\$ 100.00	\$ 100.00
			\$ 12,128.00	\$ 11,863.00	\$ 11,863.00	\$ 11,863.00	\$ 11,863.00
Revenue							
	Amount	Price/Piece	Total				
Sales Bags	2500	\$ 5.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00	\$ 12,500.00
Sales Compost	100	\$ 20.00		\$ 2,000.00	\$ 2,000.00	\$ 2,000.00	\$ 2,000.00
			\$ 12,500.00	\$ 14,500.00	\$ 14,500.00	\$ 14,500.00	\$ 14,500.00
		Profit/loss	\$ 372.00	\$ 2,637.00	\$ 2,637.00	\$ 2,637.00	\$ 2,637.00
		Cumulative	\$ 372.00	\$ 3,009.00	\$ 5,646.00	\$ 8,283.00	\$ 10,920.00

Figure 30 - Table with financial details.

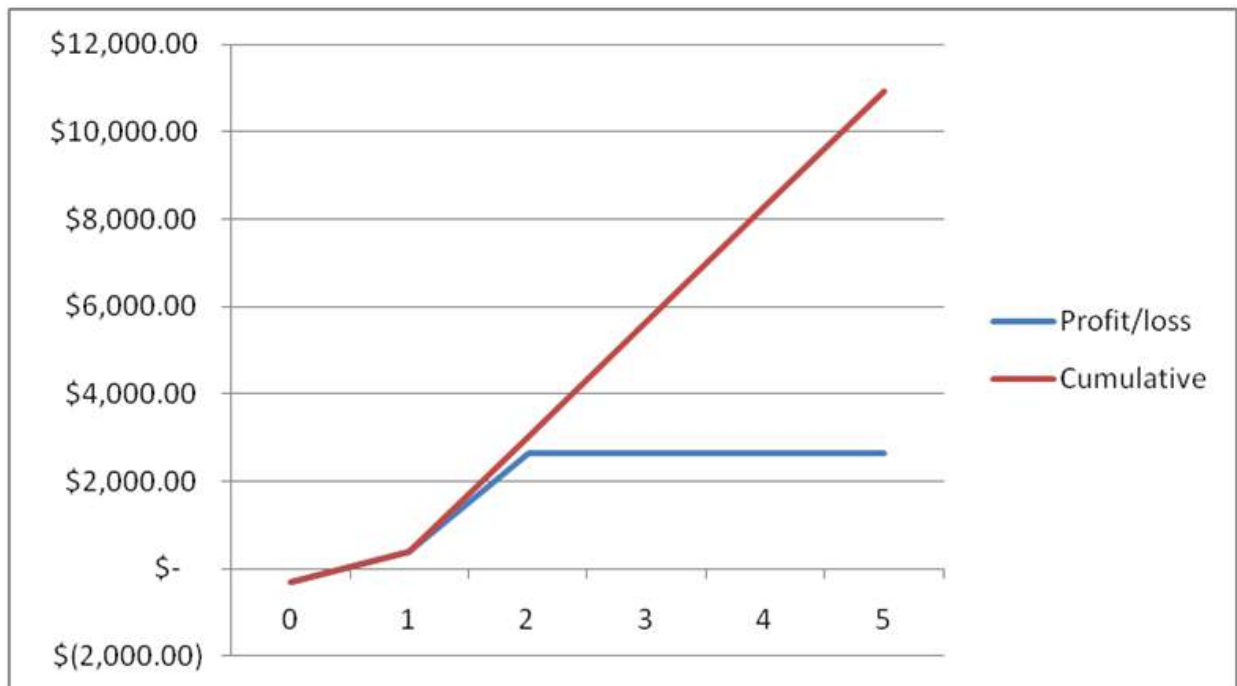


Figure 31 - Graph of profits in the next five years.

4.3.3. FEASIBILITY STUDY

4.3.3.1. PROTOTYPING

Before the whole system can be implemented, we have to prototype the cart. Furthermore, the barrels should be bought and adapted so they fit on the cart. For the cart, we will deal with the same workshop as is used for the pedal power machine. We know the employees and know the quality of their material. We will buy the material because we can estimate how much we need. Also this time, we will assist the workers to build our cart and adapt the barrel. We buy just one barrel because if it does not work, we did not spent too much money. When we see that it works well, we decide to buy three more barrels to initiate the Barrels system.

Steps:

- Buy material for one cart
- Buy one barrel
- Adapt the barrel
- Build the cart
- Test the barrel
- Buy three more barrels and adapt them
- Test the whole garbage pick up

4.3.3.2. MICRO CREDIT ALLOCATION

First twelve months:

Month	1	2	3	4	5	6	7	8	9	10	11	12
Cost Cart	\$ 65.00											
Salary	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33	\$ 608.33
Salary	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17	\$ 304.17
Promotional Costs	\$ 300.00											
Depreciation	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08	\$ 1.08
Costs Garbage	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67	\$ 41.67
Payback loan	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67	\$ 16.67
Interest on loan	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33	\$ 8.33
Total Cost	\$1,345.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25	\$ 980.25
Total Revenue	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67	\$1,041.67
Profit/Loss	\$ (303.58)	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42	\$ 61.42
Cumulative	\$ (303.58)	\$ (242.17)	\$ (180.75)	\$ (119.33)	\$ (57.92)	\$ 3.50	\$ 64.92	\$ 126.33	\$ 187.75	\$ 249.17	\$ 310.58	\$ 372.00

The micro credit will be used to buy a cart and 4 barrels for \$65 as well as initial promotional costs of \$300. The rest of the costs are costs that occur every month and consist of salary, depreciation, the costs of the garbage and the payback + interest of the loan. Revenues come from the selling of the bags and the selling of the Compost. As can be seen from the table above and the graph below we will break even at the end of the fifth month after introduction.

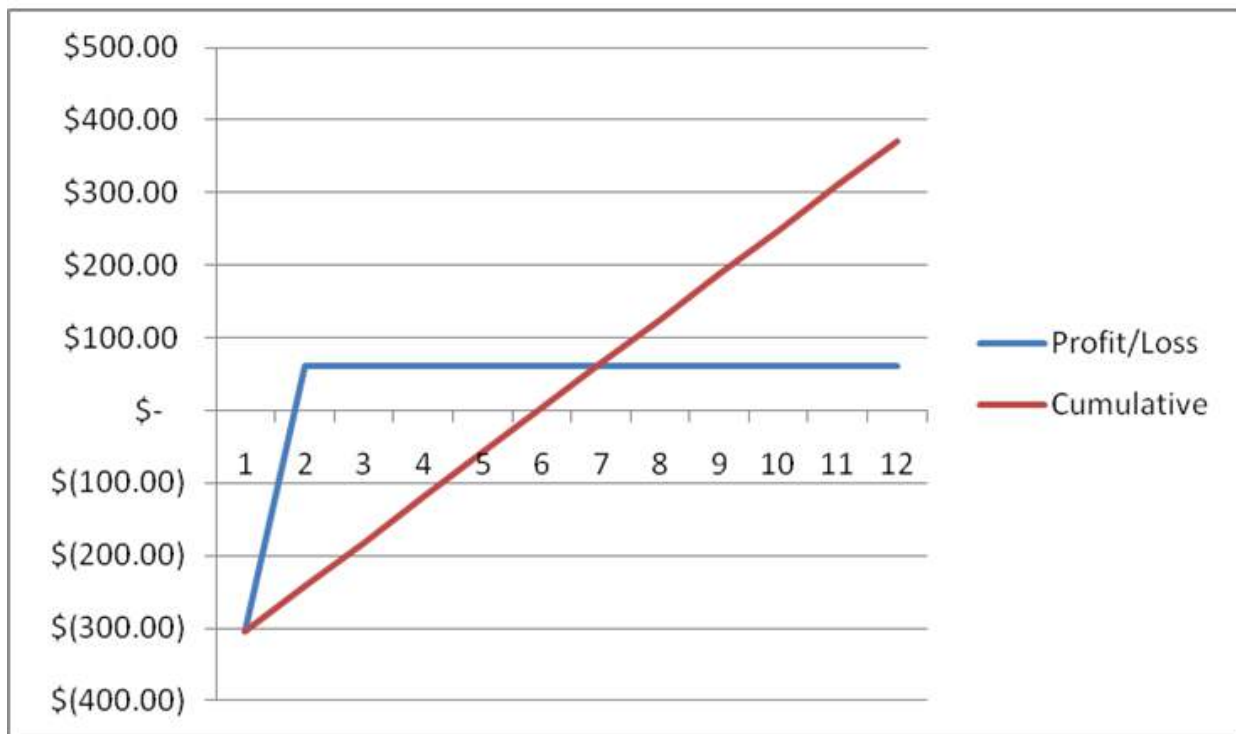


Figure 32 - Graph of profit in the first year.

4.3.4. UPSCALING

In the beginning, only the slum Bukawa uses the system to collect garbage in the slum and from the dump field. Therefore, the slum becomes cleaner and will not smell so bad after a while. Because of this advantage it is interesting to implement this system in other slums. There will be one problem and that is the 'deal with Bijenkorf'. It is not likely that Bijenkorf will sign contracts with other SEDG's. Therefore we could expand the garbage collecting to slums nearby Bukawa. The garbage collected in other slum is brought to the bag shop. This means that we will need some more employees but are also able to create more bags. So, even with more garbage, we still overview the production of bags.

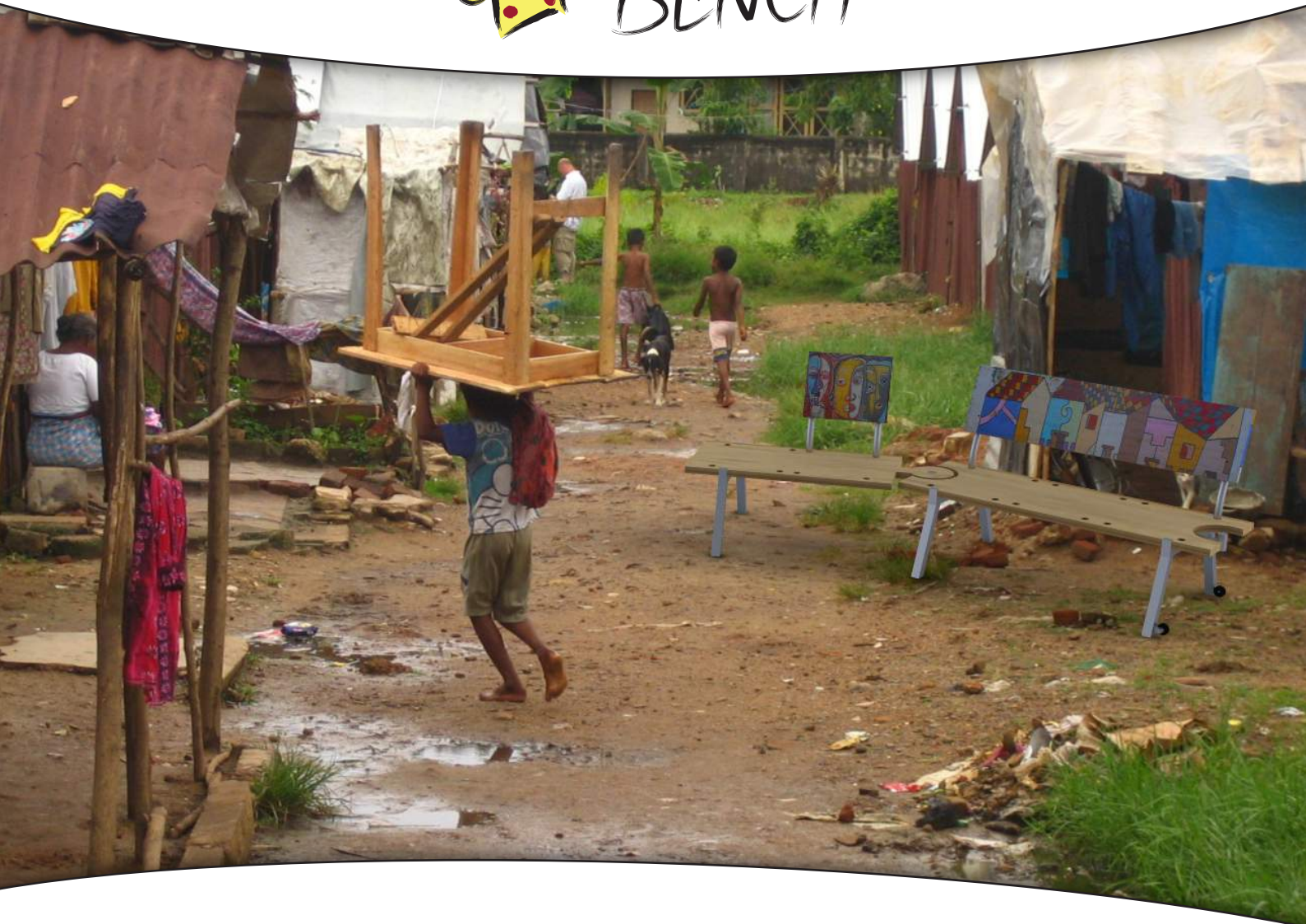
When a slum is too far from Bukawa, we could hire local people from that slum to collect garbage in their own slum. This means that there will be another person to control the collecting there. The best option is to sell the system and knowledge and to hire out the cart with barrels for a fixed amount per month. This will be interesting for another SEDG or local entrepreneur when he knows that there is an area of distribution. We could use the material for bags so there is an existing area of distribution and the more material, the better the quality of the bags could be. Furthermore, material that cannot be used by our designers could be sold to recycling companies. These entrepreneurs or SEDG would sell the bags to us so we will ultimately not only be a social entrepreneurial design group but also a social entrepreneurial trading group a SED&TG.

4.4. MODULE CONCLUSION

This project has made us aware of another problem in the slum; the garbage. After these three weeks we have created a system in which we have found a solution. After the integration, Barrels should keep the slum clean while generating income to be invested in a better infrastructure or other projects that will benefit the community. The social cohesion of Barrels lies not only in the face to face contact of our employees, but also in quite some other factors such as social capital.

The sense of belonging that is created through the fact that bags created in Bukawa, by community members and that people in the Netherlands are actually buying these bags, is very valuable. Barrels also provides a lot of Face-to-Face contact; the 'garbage-collectors' work in groups of 4, operating one machine which requires cooperation, they also go door to door to collect waste from the houses of the community members. Last but not least Barrels generates an income source from the 'North' towards this slum and thus money flows in which can be invested in the community to increase social wellbeing. Another positive aspect for the social wellbeing is the vegetable garden, community members will know be able to buy local vegetables and there becomes more food available in the slum.

5. MODULE 3 MOBILE FURNITURE



In the third and last module a mobile furniture system is designed. With the money earned in previous projects, this furniture can be provided to the slum for free. The seat consists of a base part and different add-ons that enable everyone to create a seat to their individual liking. Similar seats are again sold at the Bijenkorf to again create a positive cash flow.

5.1. PHASE 1 - IDENTIFICATION

In the first phase, we will look at the case of a system for mobile furniture and identify different opportunities.

5.1.1. CASE ANALYSIS - CONCEPT IDEA

What follows here is an analysis of the case and the environment, to gain more insights in what we are about to develop.

HOW DOES IT WORK?

In this product there is no specific technology usage. The idea is basically a bench with a back seat with the possibility to install it on two foundations for more height. The bench has multiple holes cut in where the back seat can be placed so every community member has there own back seat which they can bring along for concerts, movies and other events. The two foundations are a simple cross where the bench will lean in. At the end of the bench a wheel is placed to make it easy to move the bench.

WHAT IS IT MADE OFF?

The product consists of four different parts which are a tree trunk as a bench, the back seat, a wheel and the crosses where the bench can lean in. The tree trunk is a part of a tree cut down with several holes drilled into it. The back seat is made out of wood and decorated by the community. The crosses are made out of wood or steel. The wheel is made out of a steel base and a rubber surface.

WHAT IS THE LIFECYCLE?

The lifecycle of the product depends on a few factors such as usage, storage and the local weather. Wood is basically an element that can last a very long time but there's a possibility that it has to be protected by some sort of coating against influence by the elements.

HOW DO I USE IT?

The usage is very easy. You move the tree trunk to the place the event is and there you put it down. The next step is to place the back seats into the holes so everyone has the proper backsupport. The product is ready for usage now, but if you want to create a second row the crosses are needed. You have to place the tree trunk right behind another placed bench and then lift it up onto the crosses which have to be set at the end of each tree trunk. This might be heavy so a couple of strong men have to be involved in this proces.

FOR WHO IS IT?

The product is for everyone in the slum, the kids can sit on the tree trunk which lays directly on the ground while the adults can take a seat on the row behind them with their trunk placed on the crosses. The back seats might not be all the same because of the difference height. The back seats can be divided into three groups so that everyone has the proper backsupport. 0-7 ,8-13 and 14-100. These ages are based on the growing proces.

5.1.2. PERSONAL SCENARIOS - ELEMENTS

From the fields of opportunities we have come up with, multiple scenarios have been made. Each team member was allocated some locations in the slum. With these scenarios new ways for social interaction and possible product use could be discovered. These scenarios can be found in appendix C. Since many scenarios have an overlap the elements have been ordered according to location.

FAMILIES

1. Families are very important, take care of elderly
2. Children can transport furniture

PARK

3. Some CIMFS are placed here

HOMES

4. Multiple purpose/use of all products

COMMUNITY CENTR

5. Community Center is a meeting place for the mobile furniture, to have meetings and conversations
6. At the Community Center is a desk where the furniture can be rented
7. At the Community Center is a depot for the furniture
8. Game tournaments around the furniture are organized at the Community Center
9. Tournament prizes are goods the people really need.
10. Community Center is used for promotion

BUSINESSES

LOCAL AUTHORITIES

BANK

WORKSHOPS

11. Workshops produce the mobile furniture
12. Workshops focused on the furniture are held at the workshops to entertain people
13. Local artists decorate the furniture
14. Workshop craftsmen are asked about the producing of the mobile furniture
15. Product is used in workshops to work flexible around an object.

SCHOOL

16. Play games at school

NEW ENTERPRISE

ROAD

17. Bad quality infrastructure

MEDIA CENTRE

18. Use seats for events
19. Organizes events including it's promotion
20. Rent seats

SUPERMARKET/SHOP

WORK

GARBAGE COLLECTING

MISCELLANEOUS

- 21. It is warm outside
- 22. The whole community is excited to see the movie
- 23. The film-project will not invade on the lives of the community members
- 24. Carpet drawing together

SOCIAL ELEMENTS

- 25. Sense of belonging to the community

WATER BASIN

- 26. Water festival at the water basin after hard work
- 27. Area at water basin used as place to organize events

CIMFS FEATURES

- 28. Mobile
- 29. Cheap
- 30. Comfortable seat
- 31. Use height to watch over crowd
- 32. More people can use it at the same time
- 33. Widely available for the community
- 34. Easy maneuverable furniture
- 35. Furniture re-arrangeable for other configurations (circle/watching movie/workshop etc.)
- 36. Creativity stimulation
- 37. Charity from SEDG
- 38. Modular product
- 39. Seats are used for multiple purposes
- 40. Games are integrated in the product

5.1.3. METHODOLOGY FOR EVALUATION AND INTEGRATION

Just as last time some fields of opportunity in the sub scenario elements list are still open. This is because with our current knowledge we know that not all fields are needed and some new categories have been added. To shape the CIMFS the most useful elements have been ordered in a matrix. The same categories as last time have been used. The categories were the aspects of social cohesion, the CIMFS features, workability and moneymaking for the SEDG and the community. The three elements of social cohesion will again have a prominent role in the product development.

Aspect Social Cohesion			Aspects Concept		Aspects Funding	
Face to Face	Social Capital	Sense of Belonging	Workability	CIPS Features	How Community makes Money	How SEDG makes Money
Sit on seats and chat	Play games together	Use money to invest in society	Moved by people of different ages	Durable	Produce products in workshops, during workshops	Sell in 'de Bijenkorf
Different ages meet	Use seats for gatherings	Widely available throughout the whole community	Community centre is used for promotion	Multifunctional	Artists involved in the decoration of the seats	Provide seats for free to the community (charity)
More people can use it at the same time				Mobile	People can use product for free	
				Sturdy (unintended use)		
				Comfortable		
				Modular		

Figure 33 - The matrix with CIPS elements.

With the matrix a better understanding of the system has come. This has been of great help for the elaboration of the system and the development of the concepts, as it functions as a central mindmap for future ideas. The system coming with the product is essential because it shows how the money flows and who is involved.

5.1.4. THE SYSTEM

As we can see from the scheme on the bottom of the page, Nane is the center of the projects operations. The difference between this case and the previous case is that all the income will be generated from exporting the furniture to the Netherlands, where it will be sold by the Bijenkorf department stores. This will be valuable for the whole slum community, because financial flows will be brought from the Western world into the slum, while no money will leave the slum thus increasing the slum's wealth.

The furniture is made of wood, because that is a material that can be found in the area. In order to fight against deforestation, there will be new trees planted for every piece of furniture that is being made. The furniture will be made in the wood workshop by locals. They produce the furniture for the village. Next to that, a part of the furniture will be transported to the Netherlands. Only the furniture for the slum will have to be transportable, so a wheel will be attached. This wheel is not necessary for garden furniture, so the Bijenkorf edition will not have it. Because of the income generated by Bijenkorf furniture, this creates the possibility for Nane to give the other furniture to the community for free.

If the furniture has been produced, it will be brought to the media center, as a gift for the community. The Media Center can make some profit by renting seats when they have cinema events. The profit can be used to repay the investment such as a beamer and new movies.

Next to the furniture for the cinema events, there will be furniture in the village for public use. These furniture will become meeting points for children, adults and elderly. These furniture are also a gift from our SEDG to the community to increase the social activities.

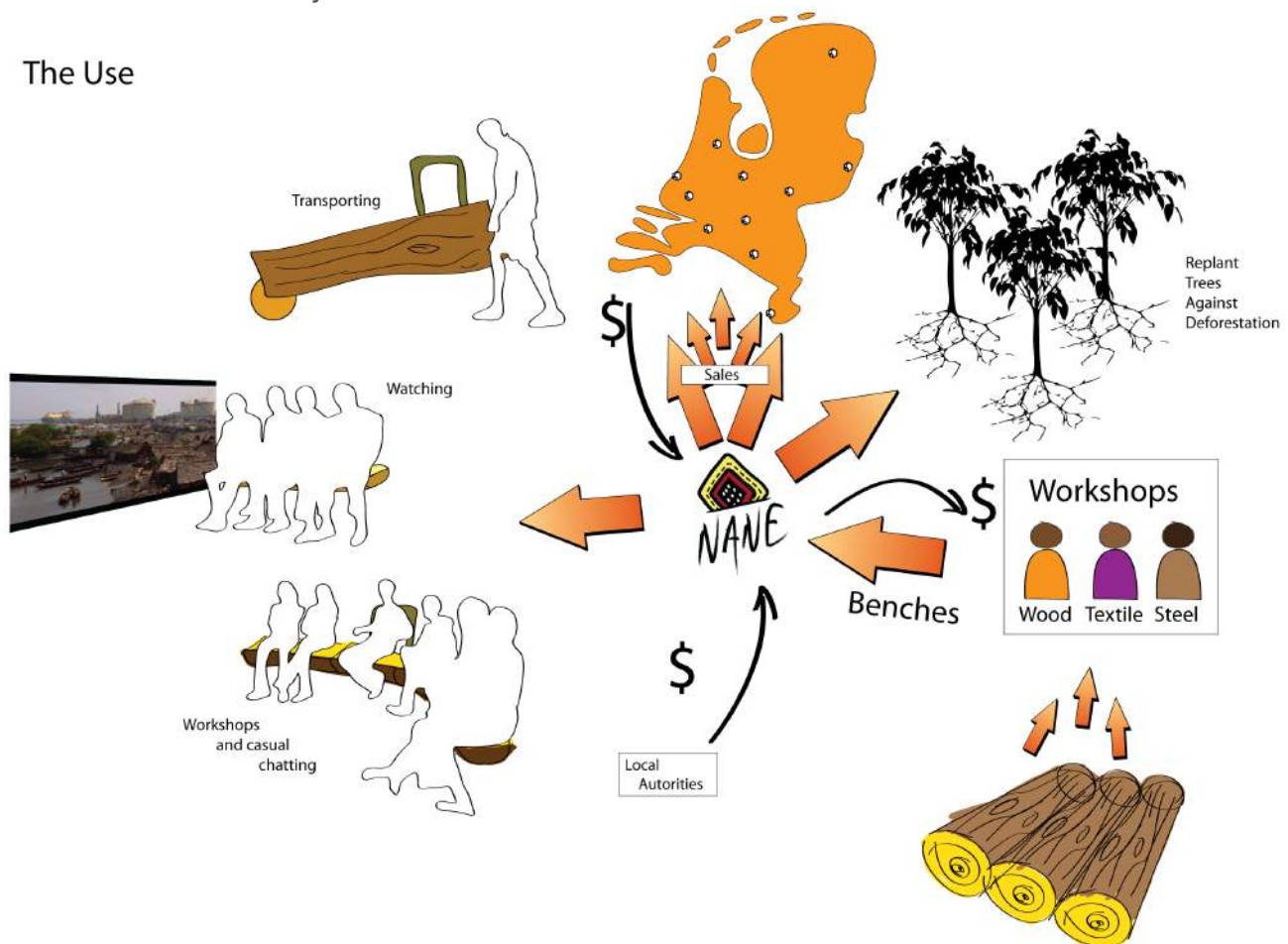


Figure 34 - A visualisation of the product system.

5.2. PHASE 2 - INTEGRATION

From the results of the previous phase, the system description and the matrix with different CIPS elements, we were able to create a final scenario. In here the use of the system, and a list of product requirements, are being described. After that, we began developing concepts to choose the final design.

5.2.1. FINAL SCENARIO

The sun rose as it had the day before and this day started as just any other day in Bukawa, still this day was different. Everybody in the little community was just a little more excited; Mohram felt it in the air, which pressed on his sweaty body like any other day. However, because of the excitement he could bear the warmth better than normal.



Figure 35 - The bench on a central place.

"Is everything ready?" Baboo asked. They had just finished the last of the mobile benches last night and Baboo, of the wood workshop, had left before the last minor adjustments were finished. "Yes, but we will still need to bring the furniture up to the water basin." Mohram answered. The workshops had worked together intensively the last couple of weeks to create 5 base-benches and another 20 junctions, every single one unique. "The thing is, we might have some rest today, but tomorrow we will start production for the benches that are going up North." Mohram muttered somewhat in himself but he saw Baboo shake his head in agreement. The benches for the Netherlands were easier to produce because they didn't have the wheel, but producing another 100 was not an easy task set by Nane. "On the other hand it is a sure income for the

next few months" Mohram thought.

The excitement in the air originated from the huge screen that Nane and some sponsoring company Mohram had never heard about had placed at the water basin to show the whole community what would be done during the following few months when Steven Spielberg, would come to make a movie about their community and the positive projects that have been introduced in the past few years. "A little bit of shameless self-promotion there of Nane, but i guess they did a good job". Mohram thought. "They even talked about earning so much money for the slum to provide for real houses. Hmm.. I'll first have to see before I believe that."

"Well, let's get some more strong men to get them there!" Baboo laughed.

"Hey man, I especially made them as easy as possible; even children would be able to bring them there if they work together!" Mohram answered quasi-annoyed.

"Hah, I'll bet you they won't even come halfway!" Baboo said and he laughed. And thus later that day the whole school class went to the workshop to help the men of the workshops to bring the benches to the water basin. The bumps and other difficulties in the road were easily avoided and within a few moments Mohram saw he was right. It was, however, a strenuous job for the children. After the benches were placed near the water basin their mothers were unable to keep the children, and soon the whole water basin was filled with playing children.

After it had become dark the crowd gathered at the water basin and soon there were few places not occupied by enthusiastic community members. There was a calming buzz of the many people talking quietly among each other. Guido looked at the people and satisfyingly concluded that they had done a good job. They had grown as a community and had adopted a greater social wellbeing and now the "pièce de résistance" was coming together. The mobile furniture has been produced and the whole

community was excited to be part of the film project. Steven Spielberg was here to show them a movie that should be an inspiration to this project and would explain some of the changes that did have to be made in order to create a successful film. Steven and Nane had however agreed that it would not interrupt the normal life of the community, unless this would be in a socially positive way. "If we hadn't then the whole film would be hypocrisy". Guido thought. Just at that moment the music started and the crowd became silent, everybody shoved to the screen while the intro started playing. When the movie finished everybody kept silent for a few seconds, it had been impressive. "All right everybody, let's put the furniture in a circle so we can discuss!" Steven said and just five minutes later the whole community was discussing the movie letting everybody speak their minds.



Figure 36 - Three views of the final design.

"I will use as much resources as possible from here, you all will be actors! The media center will be my base of operations, and the community center will be a decor where a lot of the action will take place because it is such a central place in Bukawa." Steven explained. "So, the central theme of the film will be the three projects, but what I am interested in at the moment is what would you like to show the rest of the world?"

The general consensus was that the film should show the improvement the projects had brought the community, so the initial situation should be shown, the process and eventually the progress. The residents also agreed that it should be clear that this is not the end of it, Bukawa has a long way to go and this should be visible in the movie. The movie should however not be a cry for help, but it should inform the watcher about the situation and especially what can be reached by including social cohesion to create a greater general welfare.



Figure 37 - Extra seats are added.

It was becoming late and Mohram was tired of the full day, and the next would start early as well. He asked some of his friends to help him bring some of the benches towards the community center, where they would be used for concerts and workshops. Some other benches would remain near the water basin, some at the school and others could be used throughout the community.

5.2.2. LIST OF PRODUCT REQUIREMENTS

To specify the design we made a list of requirements. In this list, we describe some features and usage of the product.

USAGE

The furniture will be used by people from different ages. Elderly can sit on the seats outside while they are chatting. Children can sit on it when there is a cinema evening. It should be possible that more than two person can take a seat on it. Next to that, it should be possible for adults to move the furniture from A to B. This possibility is necessary because people can rent the seat or use it for cinema events. With cinema events or concerts the couches should be transported up to the hill to create an arena.

PRODUCTION

The bench will be made with local materials so it is obvious that wood is the most suitable material. When we make use of plastic or garbage, the couch will not be strong enough. Other materials could be used but these will diminish the mobility. To avoid deforestation, we plant new trees for every tree that is chopped down. To realize mobile furniture, we add a wheel so it is easier to transport the seat. The wheels are optional because the wheel will not be necessary for the Bijenkorf edition.

STRONG AND STIFF

The couch should be strong enough to carry its own weight when it is lifted at one side. Next to that, it is plausible that there will be children sitting on it when an adult transports the couch. Therefore the couch should be able to carry one or more children when it is lifted. The most important situation is when a few elderly are sitting on the couch with children on their lap. In that case the couch may not bend too far or break.

WEATHER

The couch has to resist quite some heat because of the high temperatures in Bukawa. Next to the heat, the couch has to be resistant to UV light. These demands rise because of the climate in Bukawa, but when the couch will be sold in the Bijenkorf(The Netherlands) the couch should be resistant against cold weather(temperature below zero) and a lot of rain and wind. To make the couch more resistant to that weather, it is possible to protect the couches, which will be transported to the Netherlands, with, for instance, a coating.

DIMENSIONS

The bench will provide enough space for at least two people to sit next to each other. Furthermore the dimensions should be appropriate to provide comfort when sitting on the bench. Important for this is the angle of the backside and the height above the ground.

MAINTENANCE

Since the benches are provided for free to the community, maintenance here will be an issue since no clear individual is responsible. Furthermore buyers at 'the Bijenkorf' will want to perform as little maintenance as possible.

5.2.3. SCENARIO TO CONCEPTS

With the final scenario and system in mind multiple concepts have been worked out. Three of these concepts have been worked out to further details. All concepts focus on the multiple aspects of social cohesion.

5.2.3.1. THE CAROUSEL CONCEPT

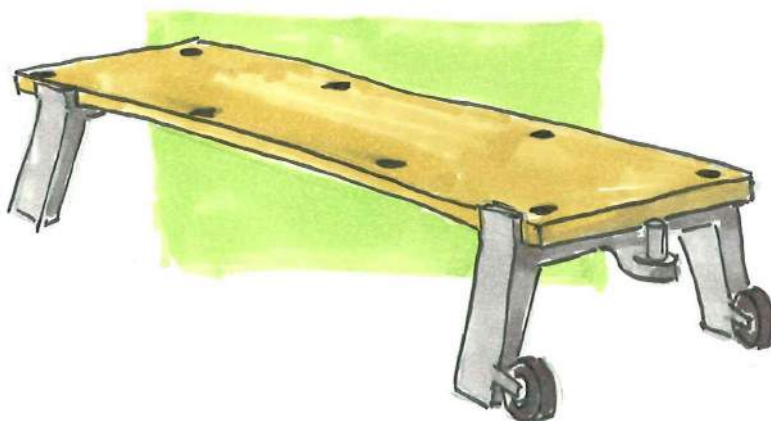
This concept is based on a couch with one leg. This means that it will cost less material to produce this couch and more important, people need each other to sit on these couches. Together, three or more couches are very stable. The villagers can have a little talk with each other, than there are sitting with their legs in the middle. If people want a little more privacy, they can sit with their back to the middle. Than there could be three different talks at least. But when more people come by with a couch, the group can expand. When they want to expand the group, they all have to communicate with each other how to do so.

Beside the couch for the village, this couch will be sold to the Bijnenkorf. People in The Netherlands, can connect the couch the their wall or fence or buy an add-on to substitute the missing leg.



Figure 38 - The carousel concept

5.2.3.2. THE PUZZLE CONCEPT



Possible add-ons:

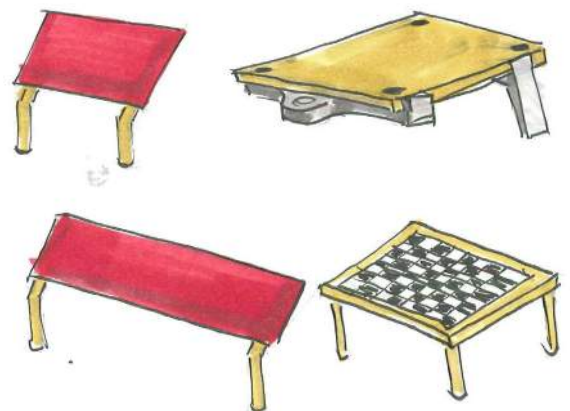


Figure 39 - The puzzle concept.

This concept is for a large part based on modularity. There is a 'base' bench: a meagre seat with holes in it. With these holes, different add-ons, like back, arm or foot rests, pillows or even game boards, can be attached and used. Also, the bench can be extended by connecting smaller benches to the side of the base trough a hinge. This way, people can transform each bench into something the whole community can use in cohesion. The benches can be moved by lifting them on one side and pushing it, with help of two wheels. The benches and add-ons are available for everyone at a depot at the Community Center. The whole system is paid by selling the benches and add-ons at the Bijenkort in the Netherlands.

5.2.3.3. THE GAME CONCEPT

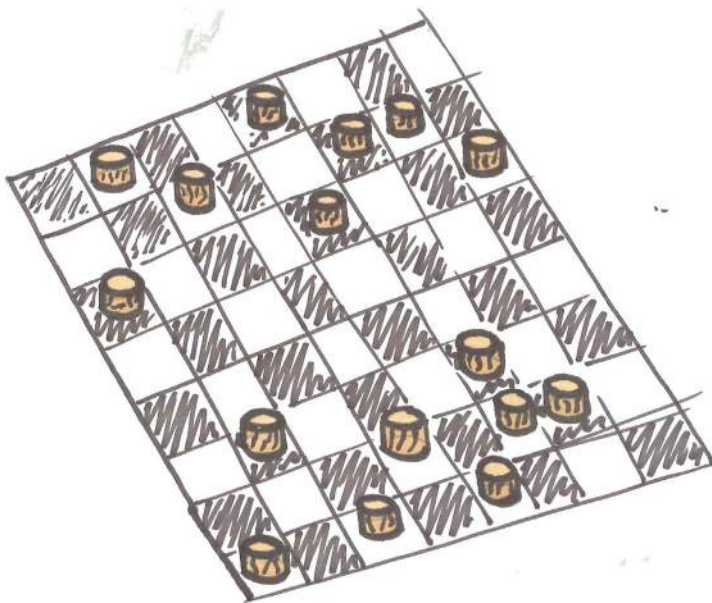


Figure 40 - The game concept.

This concept consists of multiple tree trunks placed at a central point. The main function of the tree trunks is creating a possibility to sit with each other at a central point. A secondary function is that at this place, a boardgame can be created on the floor and the tree trunks can function as a pawn. When wanting to play a game you have to gather people to join you and this stimulates face to face interaction and the sense of belonging. Next to that, this concept stimulates to create social networks with people who want to play along.



5.2.4. SELECTION OF CONCEPT THROUGH HARRIS-PROFILE

To evaluate the three concepts a Harris Profile has been filled out. Important criteria were face to face, and the suitability for both the slum and the Bijenkorf department store.

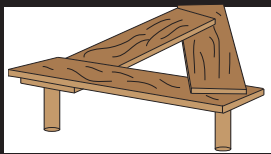


						
	Carroussel		Puzzle		Game	
Face to Face						
Social Capital						
Sense of Belonging						
Mobility						
Suitability slum						
Suitability Bijenkorf						
Atainability concept						
Atainability production						
Score	-4	8	-1	9	-4	7

Figure 41 - Harris profile for concept selection.

The puzzle concept has the highest score, having just slightly more positive points than the other two concepts, but having less negative points. Important aspect is that this concept can be implemented both in the slum and in the Bijenkorf, because it is the most 'normal' piece of furniture, so people in the Netherlands are likely to place it in their garden. In the slum, it is a nice, mobile couch, that can appeal to people's creativity because of the add-on possibilities.

5.2.5. FINAL DESIGN

A primary point in the design is the modularity. Due to the different parts of the seat, different compositions can be made. This means that the seat can be used for multiple purposes. For instance rows can be made for a cinema setting, or a circle for games and conversations.

The central part of the couch has wheels and can easily be relocated. The other parts can be connected to the first part by the puzzle-piece shaped hinge. Without the first part the continuing parts cannot stand because they only have 1 set of legs. The additional parts will all have the same depth, but the length will differ.

In the seats regular spaced holes will be drilled. In these holes backseats can be placed. The backsides can differ in height and design, making them more personal. The dimensions can also differ, meaning some backs can be used by only one, two or more people.

The seat of the furniture will be made of wood. This will provide the seat with a firm character. Different seats will have a different height, enabling people in bigger set ups to have a good overview due to the difference in height. People will be able to let their creativity guide them: custom add-ons can be created, decoration can be added and maybe some young entrepreneurs will be able to make a business out of providing these kind of services to others.



Figure 42 - Different views of the total bench (right), the base bench (top left) and some add-ons (left).

5.3. PHASE 3 - IMPLEMENTATION

Guided by the final scenario the implementation for the CIPS has been worked out. The design has been established and the general system is clear. For the implementation the system is most important, no matter how good the products is, without a well functioning system the cart is of no use.

5.3.1. COMMUNITY INTRODUCTION

This CIPS has to be introduced in the community because it is new to the villagers. First we have to explain the product. When everybody knows about the product, we will explain the system so everybody knows where they can get it and how to handle it. This first step will exist out of posters and short meetings which promote the furniture. In the meeting, a designer of the SEDG will explain about renting a couch and what we expect from everybody.

There are two scenarios for step two. This is about the workers in the steel and wood workshop. If they have enough work to do, and new work for the couch means an overflow of work, we have to search for new employees in the villages. This will take a little more time because they have to be qualified. The other scenario is that there is not enough work yet for the workers, and than we do not have to search for new employees in the workshops. This would be a lot easier because we do not have to educate people about the work.

Step three is about introducing the furniture in the villages. We have to bring them to the Media Center where they will lent the furniture. Also for that, somebody have to be responsible because somebody needs to know where all the furniture is. Next to this, that person has to watch if a bench needs to be repaired when they are damaged.

The fourth and last step is explaining about the Cinema events. When there is a Cinema event, everybody who is coming needs to pay a little fee for the beamer and DVD player. All the furniture will be used so everybody can sit on a bench. Because the screen will be down at a small hill, everybody has a good view.

In the next table all social elements that are integrated in our CIPS have been listed. Next to the element are the action and the people involved for the implementation.

Element	Action	People involved
1	Introduce pictures of the furniture in the village	Media Center
2	Explain the advances of the couch, who may use it and where	Designers of SEDG, villagers
3	Explain about the system of hiring	Villagers, SEDG, Media Center
4	Search for a responsible one	Media Center, SEDG Villagers
5	Discuss the amount of work	SEDG steel & wood workshop
6	Search for new employees if it is necessary	SEDG workshops, villagers

Element	Action	People involved
7	Discuss about the storage in the Media center	SEDG Media Center
8	Discuss about new employee for the Media Center	SEDG Media Center
9	Search for new employee	Villagers
10	Explain tasks for the responsible one	New employee
11	Make agreement about cinema events	SEDG Media Center

5.3.2. BUSINESS PLAN

5.3.2.1. BUSINESS OBJECTIVES

- Generate at least 5 jobs in the first year
- Sell 60 benches a year from the second year onward
- Reward the community with benches for their effort
- Generate income for the community by selling to western countries

5.3.2.2. DESCRIPTION OF PRODUCTS AND SERVICES

There are multiple products produced in the slum, but not every product is already known. We intend to give the community members a possibility to start their own business with producing accessories which they can sell in their own community and even to 'Nane' which will sell it to the middleman.

BENCH

The bench will be the main product of the line. It consists of two different frameworks, one without wheels at the legs and one with wheels for easy transportation. On these frameworks a wooden board is placed with holes at the sides. These holes are made for steel bars with boards attached to them for a proper back support. The bench has the size to support three people.

ACCESSORIES

For starters there are three main accessories that will be produced and sold to the middleman. In addition to the three-seat bench there will be a two-seat bench, a one-seat bench and a coffee table. These accessories have the same principle as the main bench which is a framework with wooden board and a connection possibility to the main bench.

Other add-ons to the bench are back rests and game boards. Only basic ones are produced by Nane. For other possible add-ons, we count on the creativity of the slum villagers: people will be able to create their owns or just customize bought add-ons.

WORKSHOPS

To stimulate people to make their own add-ons to our bench, workshops can be held, where people make their own under accompaniment of a professional. This way, it is stimulated to hang out with each other and support other people.

5.3.2.3. ORGANIZATION AND MANAGEMENT

'Nane' is responsible for the quality check of the wood and products itself. We will use the same partner for transportation to the Bijenkorf as we did last time with the garbage-bags.

'Nane' will stay in control of all production facilities so producers will be employed and paid by 'Nane'. The employees will earn \$2,- a day with a bonus at the end of the year if the production is going well.

PRODUCTION

To produce the 60 benches a year we need 3 people to work on the frameworks and 2 more who produce the wooden boards. Next to that we hire local artists to paint or decorate the back supports. 'Nane' will take care of storage and transportation within the slum and also the sales to the middleman will be done by 'Nane'.

5.3.2.4. MARKETING AND SALES STRATEGY

The marketing and sales strategy will be focussed on selling the product to the Bijenkorf, because that is where our profit lies. The product will be a gift to the community for all their good effort and cooperation with the previous product implementations.

MARKET SEGMENTATION

The segmentation for the bench puzzle system is a bit hard in the Netherlands and that is why we made some changes to the slumproduct so it will fit in the Dutch communities. Once those adaptations are made, the targetgroup will mainly consist of fairly wealthy families who care about the third world countries and have room for an 'art' object in their house or garden. The puzzle system will still remain in the Dutch product so there is a possibility to buy a chain of products. With this product we create the possibility for people, who do not want to donate to foundations, to let the slum benefit while buying a product from that region.

Positioning statement:

'Nane's bench is a functional artwork for those who want to let the less-fortunate people benefit from their purchase.

Value proposition:

Target market: wealthy Dutch families

Benefits offered: An indirect way to create wellfare in third world countries

Price range: €200 - €400

PRODUCT STRATEGY

We created a complete productline so there have to be differences in strategy for some products. The main product is the bench, but with that bench you can create a chain with all kinds of furniture. The main function of the bench is creating the possibility to have a seat. Next to that the bench can be seen as an artobject with a deeper meaning. Namely, the bench is produced by people who are less-fortunate than the buyer so the buyer creates a good feeling for himself while supporting a community in the slum.

The chain of products consists of a 3-seat bench, 2-seat bench, 1-seat bench and a coffeetable. The 3-seat bench will be the basic product where the other accessoires can be linked to. The other accessoires cannot stand alone so the bench will have to be bought before expanding.

The last part of the product is the augmented product. This describes the non-physical features of the product such as quality checks, warranties and services. The quality will be checked at the production centre. This quality check consists of the proper quality wood used in the product and the calculation of the construction of the frame. Next to that, a supervisor will be selected and given an education about the production of the benches with accessoires to overlook the production quality.

PRICING STRATEGY

There are three aspects that have to be considered in order to come to a right pricing strategy; costs, competition and customers.

Costs

To break even with the costs of a single bench it has to be sold for approximately 50 dollars. Ofcourse, the prices for the accessoires will be lower. But in this case we give away some benches and accessoires for free to the community for all their effort in the previous cooperations. The price that is being discussed is the salesprice from slum to transporter or middleman so the eventual price at the Bijenkorf will be a lot higher. To make an educated guess about the price from slum to middleman there has to be taken into account the amount of benches and accessoires given to the community and the amount we sell at the

Bijenkorf. The Bijenkorf will sell it for approximately €300,- so when counting backwards the middleman will sell it to the Bijenkorf for €150,- and Nane can sell it for about €75,-. €75,- is approximately \$100 so with every bench sold to the middleman we can give away one free bench to the community.

Customers

In addition to the costs we also have to take the customers into account. These customers are already reviewed in the market segmentation. The customers are fairly wealthy families who are interested in 'art' and who care about the faith of third world country inhabitants and especially communities in a slum.

Competition

The competition for the product is different than normal. Because the production takes place in poor communities with a certain goal the products cannot be seen as a competition for a normal mass-production sofa or gardenfurniture. This makes it easy to distinguish the product from others with a clear explanation of where this bench comes from and what the purchase will mean for the producers. Products that can be seen as a competition are different products produced in the same way as the bench so for example a bag made out of garbage by poor communities

PROMOTION STRATEGY

Because of the involvement of a middleman and the Bijenkorf we do not control the final promotion, this will be done by the Bijenkorf themselves. Our strongest promotionfactor is that it is produced by locals in a slum and that they will benefit from your purchase so that is where our aim will be. To create a certain connection with the buyer of the products we will design a special certificate with several items on it. This certificate will consist of a 'keurmerk' that every material has a good quality and it does not have an influence on the enviroment. Furthermore a short story about the slum it's made in will be written on the certificate by a communitymember to create compassion. Also a signature of the local employees who produced the bench will be on the certificate. The certificate will also show a picture of the situation in the slum and last but not least the benefits recieved by the community will be displayed on the backside.

The product will be marketed as the 'Bukawa Bench', named after our slum, 'Bukawa'. This accentuates us doing something back for the slum by placing the benches at public places. The people of the slum get thanked for supporting our cause. The logo is derived from a puzzle piece, showing that the bench can be supported by other parts and the add-ons.



Figure 43 - Bukawa Bench logo.

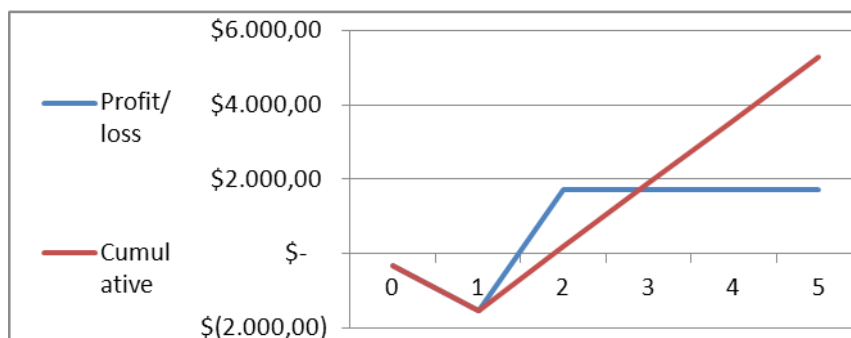
DISTRIBUTION STRATEGY

Distribution will be taken care of by the middleman who buys the products from the slum and sell the products to the Bijenkorf through existing channels so this is not necessary to be further discussed.

5.3.2.5. FINANCIAL MANAGEMENT

As can be seen from the table on the next page, the first year will generate a loss of \$1520,- Considering the fact that we have made money with both previous projects we know there is enough cash left in our bank to finance this project. After the first year, at the end of the second year we break even on this project and have already given the community 25 benches. This last number can be expanded as we can see that we make enough money to pay ourselves and still retain something in the bank. Overall the three projects have generated a lot of money and the last two brought money from the 'North' to the slum which means that the slum has become richer on its own without NGO's etc. We believe this is the only way to

help developing countries and therefore we are happy to have shown this is possible. What can be done with the money we have generated is building better houses, further increasing the social wellbeing, making real roads or even more basic thing such as providing clear drinking water. Another aspect that will have to be considered is of course looking out to other slum areas and thinking about how these can be improved.



Costs			Year 1	Year 2	Year 3	Year 4	Year 5
	Amount	Price/Piece	Total				
Wood	50	\$ 5,00	\$ 250,00	300,00	300,00	300,00	300,00
Steel	50	\$ 0,50	\$ 25,00	30,00	30,00	30,00	30,00
Personnel	100	\$ 2,00	\$ 200,00	120,00	120,00	120,00	120,00
		SubTotal	\$ 475,00	\$ 450,00	\$ 450,00	\$ 450,00	\$ 450,00
Entrepreneurs Salary	1825	\$ 2,00	\$ 3.650,00	\$ 3.650,00	\$ 3.650,00	\$ 3.650,00	\$ 3.650,00
Promotional Costs	1	\$ 300,00	\$ 300,00	\$ 100,00	\$ 100,00	\$ 100,00	\$ 100,00
Depreciation	1	\$ 95,00	\$ 95,00	\$ 95,00	\$ 95,00	\$ 95,00	\$ 95,00
			\$ 4.520,00	\$ 4.295,00	\$ 4.295,00	\$ 4.295,00	\$ 4.295,00
Revenue							
	Amount	Price/Piece	Total				
Sales Benches	30	\$ 100,00	\$ 3.000,00				
	60	\$ 100,00		\$ 6.000,00	\$ 6.000,00	\$ 6.000,00	\$ 6.000,00
			\$ 3.000,00	\$ 6.000,00	\$ 6.000,00	\$ 6.000,00	\$ 6.000,00
		Profit/loss	\$(1.520,00)	\$ 1.705,00	\$ 1.705,00	\$ 1.705,00	\$ 1.705,00
		Cumulative	\$(1.520,00)	\$ 185,00	\$ 1.890,00	\$ 3.595,00	\$ 5.300,00

Table 1, balance sheet first five years

5.3.3. FEASIBILITY STUDY

5.3.3.1. PROTOTYPING

Steps that have to be taken to create a prototype of the product:

LOOK FOR A GOOD SUPPLIER OF TREES

It is important to know who a good supplier is, since we want to build a sustainable bench for the community in Bukawa as well as for the Bijenkorf. If the trees are cut illegally, it will damage the brand image of the Bijenkorf, but also our SEDG's. Therefore we need to know who is the supplier. Next to that, the quality of the wood has to remain equal. We could not afford us, to call a quarter of the production back because of a lack of quality.

MAKE A AGREEMENT ABOUT PLANTING NEW TREES; 3 NEW TREE REPLACE ONE TREE THAT HAS BEEN CUT DOWN

Because we are a SEDG, working in a slum to offer everybody a better life, the well being of the villagers but also the earth is very important. However, when we make the bench out of wood, we will increase the amount of forest by planting new trees that may not be cut down in another 60 years. And even when these trees are old enough, for every tree that is cut down, tree new tree have to be planted. This way, we keep the environment healthy.

DISCUSS WITH WOOD WORKSHOP HOW THE WOOD WILL BE CARRIED TO THE WORKSHOP

We want that every workshop is responsible for his own materials so people involved feel more committed to the shop. Therefore the workers from the wood workshop have to order new trees if they need more. They can call the wood factory. The wood factory will bring the trees because we will order much more if he is willing to bring the trees to us.

EXPLAIN THE DESIGN TO THE WOOD AND STEEL WORKER AND SEE IF THE WORKER BUILDS THE BENCHES IN THE RIGHT WAY.

This task take much time into account because the first time, the worker has just a image. Therefore, we are there to explain the design and help them with problems. Next to that, the steel worker have to build the frame and at the end, they have to combine their work to finish the job.

If this all goes well, and we are happy about the result, we can determine to produce these chairs on a larger scale.

5.3.3.2. MICRO CREDIT ALLOCATION

Month	1	2	3	4	5	6	7	8	9	10	11	12
Cost Bench	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58	\$ 39,58
Salary	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17	\$ 304,17
Promotional Costs	\$ 300,00											
Depreciation	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92	\$ 7,92
Total Cost	\$ 651,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67	\$ 351,67
Total Revenue	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00	\$ 250,00
Profit/Loss	\$ (401,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)	\$ (101,67)
Cumulative	\$ (401,67)	\$ (503,33)	\$ (605,00)	\$ (706,67)	\$ (808,33)	\$ (910,00)	\$ (1.011,67)	\$ (1.113,33)	\$ (1.215,00)	\$ (1.316,67)	\$ (1.418,33)	\$ (1.520,00)

The micro credit will be used to start building multiple benches for the community; \$9,50 each, salary for

personnel and for ourselves as well as initial promotional costs of \$300. The rest of the costs are costs that occur every month and consist of salary and depreciation. Revenues come from the selling of the benches to (eventually) the Bijenkorf. As can be seen from the table above and the graph below we will not make any profit in the first year, however as mentioned at the financial management part, eventually we will make money and the first losses will be paid for by the money we generated with the first two projects.

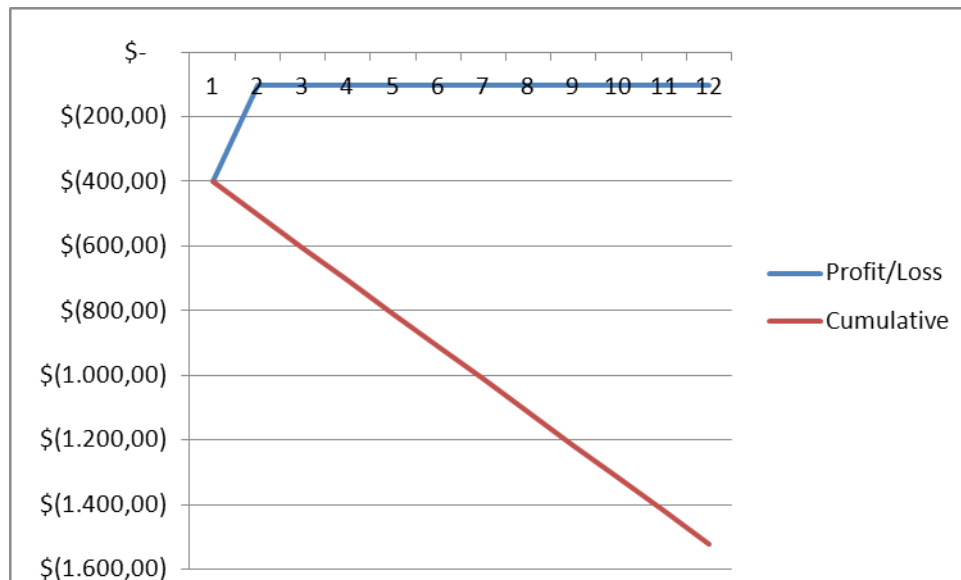


Figure 44 - Graph showing profit in the first year.

5.3.4. UPSCALING

The upscaling part is a difficult task because the product is from this specific slum and that makes it unique. If the same product is produced elsewhere the whole idea behind the product would be destroyed so that is not an option. Another option is to design and produce more furniture which fit the bench and sell these to the middleman. This way, we keep the product unique by producing it in the same slum and we upscale by hiring more people for production and selling more to the middleman.

Another possibility for upscaling is designing a complete new product and move to another slum which will be able to produce it locally. If we use the same system as in Bukawa we broaden our income and have less risks to take. This system will be known by the people in the Netherlands through the bench that is already for sale at the Bijenkorf. So promotion will be done in the same way for a recognizable product only the product is completely different with a different function.

5.4. MODULE CONCLUSION

We used this project to do something good to the community of the slum. The last two projects really required the help and cooperation of the community to be succesfull so in this project we wanted to give something back to the community. We still needed their help in producing the products but this time half of the products they produce are for their own community. With the help of the financial plan we concluded that with the right price we still make some profit which we can start other projects with. The benchsystem is a definite way to create social cohesion because the community can gather around without having to sit on the floor or bringing their own seats.

Because of the great promotion plan we create a sense of belonging in the community. Furthermore every benchsystem is provided a certificate so that people can relate to the community and a different sense of belonging is created. These systems are provided by 'Nane' and are placed at random spots but there are always multiple benches available so that more people can sit together and this stimulates face to face contact.

The benches that are being sold in the Netherlands create a cashflow from 'Western countries' to the slums which indicates that the slums will benefit from their own productions in the best way possible.

6. FILM SCENARIO

Because our activities in our slum Setting X have attracted some media attention around the world, various movie production companies have showed interest in making a documentary about our SEDG, our vision and our work. Of course, this is a very big honour for us. Because we have to show the production company what we want and how we would like to see this film, we have created a movie outline. In this outline, we will tell about the story we want to tell and what different scenes we envision.

Working title: Bukawa – The story of a community

Story:

In the documentary, the story of Jade will be told. Jade is a 12 year old girl, growing up in the slum Bukawa. The first part of the movie is a flashback to the old situation in the slum: dirty roads with a lot of trash all over the place, dark streets at night and a visibly unpleasant environment. Jade is a little girl there. She often stays inside, because she does not like it on the streets.

At one day, a group of people is starting up something new. Jade notices, because she sees one of the slum buildings that was previously unused and dirty cleaned up and painted in a nice cream colour. Two of the sides of the building are decorated by local artists. Jade is explained that the building will be used by a group of young people from the slum, that have been away for some years to get their education in the big city. Inspired by a foreign Westerner, that motivates and teaches the youngsters, The Westerner is played by a big star, Harrison Ford for example. The group calls itself 'Nane' and wants to improve the social cohesion of the community by implementing product systems, based on technology that is common in the Western world, but can be put to good use in the slums as well. Jade meets the Westerner and is also inspired by his thoughts and teachings.

The story goes fast forward. Nane introduces different product systems, such as Pedal Powered LED Lighting and a Garbage Collecting System. The movie focuses on the benefits that Jade experiences: with the lighting, she is able to do more school work at night, while her father can work for Nane collecting garbage. This way, the whole family is benefiting from the work Nane is pulling off. She also notices that the slum changes: cleaner streets, more people that are happy and more of a community feeling in the slum. People are talking more to each other and there are more social activities.

However, Jade is doubting some of things Nane does. She is a smart girl, she goes to school. With some simple mathematics, she figures out that the young entrepreneurs actually make pretty much money. She wonders what is going on: why are these people taking money from their own community? Jade tries to investigate, but cannot find out what is going on. Then, one day, in the whole slum are these new pieces of mobile furniture, placed there by Nane. Everyone is free to use them and Nane even organises cinema events for everyone.

In the end, the Westerner explains to Jade that this was the plan all along: create some working capital, to have the room to search for opportunities to extract capital from the Western world to the slum and to give back at the end. With everything they did, Nane was able to make a deal with a big department store, where they can sell their work. Jade is satisfied, she looks forward to the next movie night.

7. CONCLUSION AND DISCUSSION

In this course we had to design a CIPS (Community Integrated Product System) which would stimulate the social cohesion within a community. The problem we faced in each module is that we had to make a lot of assumptions about the people and environment in a slum. Therefore none of the designed products actually guarantee that it will stimulate the social cohesion because of so many unknown variables.

Furthermore it is questioned whether people in third world countries really need a product that enhances social cohesion. In our opinion those communities have much more face to face contact than in western civilizations nowadays.

Next to that, we had to design a pedal power system which would charge a battery and could lit a LED-lamp for 10 hours (when cycling 10 - 15 minutes). In reality this seems a bit overrated because it's not yet possible to power a battery 15 minutes and use it to lit a LED-lamp for 10 hours. If this would have been possible there is a fairly good chance for this system to really work in the slum because of the many benefits.

In the second module we had to design a garbage collecting system with an extra feature. The garbage collecting system was a good idea to create a new face for a community. A slum is always compared with a garbage belt and to get rid of that metaphor a garbage system is a good solution. The extra feature is a bit hard to imagine because you never know exactly what the bags would look like and if the Dutch people are interested in those particular bags. But of course, with an assumption that they would be interested a reasonable profit is created to help the community and naturally create wellfare for the SEDG.

The third project might just be the most feasible project of all. This is because we do not ask for money from the community, we give away these bench systems for free. So the community side will work in this project, but what about the Bijenkorf story? We believe this would work as well, just look at the products they are already selling. There are multiple designer products being sold at the Bijenkorf and the Bench system can be seen as an art product made by people who are less fortunate than you.

Of course, the main question remains that is it feasible? Our community lives in a setting X with a lot of facilities that are not guaranteed in every slum. This is impossible to check because it's not real. So for these projects to really succeed in the real life much more investigation has to be done. Not just about what is available in a slum, but also how the community responds to a SEDG in their slum. Everybody has their daily routine and own way of staying alive so who can tell if they would cooperate in these projects?

We already discussed that in our opinion social cohesion in a slum is bigger than in the western civilization so this is also a rather big issue of the modules. Why choose to design for a slum where you have so many unknown variables if the results you can achieve in the western civilizations can be much bigger?

APPENDICES

APPENDIX A - SEDG BACKGROUND

GROUP DYNAMICS

In this paragraph, we will briefly discuss our functioning and planning as a group. This is to give you some insight in our group dynamics.

TASK DIVIDING

We have discussed the dividing of tasks during our first meeting. Every morning when we meet, we discuss what we need to do that day and agree on milestones during that day. We check what can be done individually by one of the team members and what has to be done with more people or as a group. Then we divide the tasks for that day. Some more specialist tasks that occur more frequently are assigned to a specific person: Remco is responsible for the 3D model, since he has the most experience with building this kind of models. Jorn is responsible for the report, both putting all pieces together as doing the lay-out in Adobe InDesign. Since Guido is the only one that is going to follow the SPD Master for sure, he will be leading the business model for the implementation of our product.

TEAM CAPTAIN

We do not have a regular system for assigning a team captain. As we assign tasks to everyone, each person is responsible for his own task. For the group tasks, we assign someone that is responsible for this task: from leading the discussion to processing it to be documented. The person that is responsible for the report will check if everything is reported and will make one coherent report of it.

EXPECTATIONS

We talked about our expectations from each other. From that talk, it appeared we expect from each other to be on time in the morning. Every morning we will meet at 9.30. If someone is considerably late, he or she will be 'fined' with getting the whole team coffee. Next to that, we spoke about completing our tasks. We want to be flexible in scheduling our time. When someone of the team has to leave early, that should be possible, but the task that person was assigned with should be completed the next project day. It is up to the responsibility of that person to get it done. We think is okay if something is not fully completed, but as soon if someone says or promises that it will be done, it should be done. This is a trust issue and we hope this 'rule' will not be violated.

INDIVIDUAL VS. GROUP FUNCTIONING

As said before, each morning we will decide what will be done that day and if it has be done by an individual or as a group. As a group, we think it is important to listen to each other and to respect each other's opinion. We should reach a consensus that we all agree with while developing the product. As for the individual part, we feel that it is important that everyone delivers his task on time and with sufficient quality, so that that part can be included in the report with little editing.

HOUSE STYLE AND REPORT DESIGN

In this chapter, we will briefly describe our house style and the choices that were made while developing it.

SEDG NAME AND LOGO

As name for our SEDG, we have chosen 'Nane'. We were looking for a name in an African language, because the slums there are well known and studied. Of the around a billion people living in slums, more than 120 million are estimated to live in Africa. Since we are group eight in this course, we ended up with 'nane', meaning 'eight' in the African Swahili language. Also, the figure 8 closely resembles the infinity symbol ∞ . This stands for our will to incorporate the whole society within our projects: the whole community will make this project a success by working together, it is not just us.

Our logo is inspired by traditional African art. This shows our solidarity with the people of our slum and our will to not only implement new products in the society, but also to look further to really integrate the product with all different levels of activity in the slums.



Figure 45 - Nane logo



Figure 46 - Inspiration for logo and artwork.

FORMAT

The paper format we will be using is 'normal' A4-sized (following ISO 216 standard), or 297 by 210 millimeters. Since any other paper size will be scarcer, it will be more expensive. We should be able to cut paper in any size we want, but then we will have a lot of paper cutting waste, that we are not able to recycle ourselves. Also, because we will be using standard printers that work best on A4 size, this size is the most convenient for saving time and money.

FONT

Because ink is and expensive and, dependant on manufacturing and composition, an environmental burden, we looked at the possibilities of using less ink to save money and contribute a bit to the environment. Of course we could be using some obscure outline font, that saves a lot of ink, but is practically unreadable, but we still are a serious company. That is why we have found a different option: the EcoFont®. With this font, developed by Dutch marketing and communication agency SPRANQ, users can save up to 25% ink. This is, because small holes are punched in the font. The font is readable without problems at a size of 10 point. That is why we are using that size. Since it is sans-serif, it uses even less ink.



Figure 47 - EcoFont logo

For the font of our headers, we have chosen another font, since the EcoFont® is less readable at larger

sizes. We have chosen a font that resembles the text in our logo. In our logo, the text is hand written, but it would take too much time to write every header ourselves. Our choice is the font Edo SZ, which is a clear, readable brush type font. For a header, it does not have to be displayed very large: size 20 is enough.

The creators of both fonts allow free and permission-less usage.

PAPER

Instead of just using ‘standard’ white paper, which is the easiest option, we will be using recycled paper (brand Office Plus, type Nature). Although recycled paper uses the same amount of energy when produced as normal paper, it uses less water, which also can be used for drinking. On top of that, land that is used for growing trees for paper production can be used for growing food if the demand for recycled paper grows. The Office Plus Nature paper carries the ‘Der Blaue Engel’ hallmark, which indicates that no chlorine, bleach or other whiteners were used during production. Also, the paper is made of a certain percentage of old paper. Although colored images will be displayed somewhat distorted on the crème colored paper, we think this is justified for the good cause. In the future, we could look at the possibilities to let the people in the slums recycle the paper we will be using.

Besides using recycled paper, we print everything double sided to save paper. Also, while making notes during our project, we will try to use wastepaper whenever possible.

COVER DESIGN

It is tempting to create a visually very appealing, but also resources wasting cover design for our reports, but that would not correspond with the story told above. That’s why we have chosen for a fairly neutral, using a lot of unprinted space, but professional cover design, to save resources like time and money. The cover design shows our SEDG’s name, our logo and member details. Next to that, it shows the title of the report and a reasonably sized visual representation of its contents. This way, the reader will have a good impression of the subject before starting to read the report.

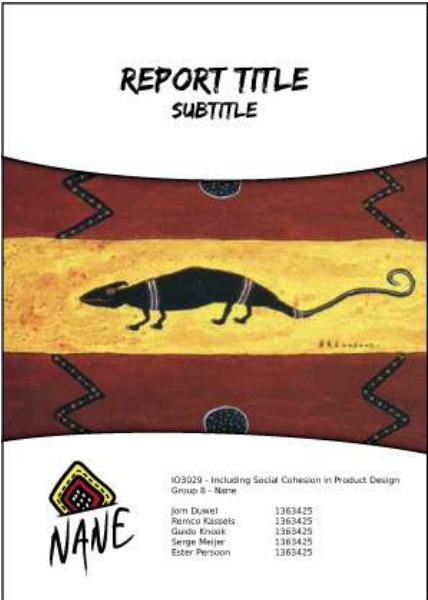


Figure 48 - Report cover setup.

APPENDIX B - INDIVIDUAL SCENARIOS MODULE 1

JORN DUWEL

Fields of Opportunity: Homes, Family

Scenario 1

After a long day of work, John comes home to his wife and children. Earlier that day, the children went to the Community Center after they were done in school. At the Community Center, a bunch of public accessible pedal stools are available to citizens of Bukawa free of charge. John and his wife decided to give the children the task of charging the battery every two days. They can decide for themselves who has to do it. This way, the children develop a sense of responsibility. Since the lighting is far less dangerous than the original petrol and candles, they can play with it safely.

At night, everyone gathers around the light to have. The family discusses the day they have had. After dinner, some children stay to hang around, others leave to play at friends. Around the light, the remaining children make their homework. The older children help the younger ones, since they are sitting next to each other. At night, when everyone is inside again, they go to sleep together, and the light is turned off.

Scenario 2

Since Carlos is the eldest son in his family, he and his wife Edite took the job of taking his mother in their home when she got too old to take care of herself, since this is usual in their culture. They now take care of her. Carlos' mother likes her privacy. At night, she likes to sit a bit alone in the corner of the house. To respect that, Carlos has thought of some sort of rule: he has bought two LED lights and two batteries. The children can have one of both, to play on one side of the house. On the other side, still close to the children, but far enough away to have some rest, the adults gather round a small table.

The children invited some friends over to play with them. Since they have their own light, they can see enough. Other children like to come over, because they don't have their own light at home. At the adults table, Carlos and his mother are chatting a bit about the day. Carlos tells a story he heard at the Pedal Place, as this new business is called. Batteries are sold at considerable discount there, to promote people having them or even having multiple of them. The batteries can also be charged there, as there are multiple Pedal Power Stools available there. A small fee is required to pedal there, to bear the costs of the battery discount and to pay for the Stools.

Scenario 3

Farid was lucky enough to be selected by the local authorities to be able to buy one of the Pedal Power Stools, based on the location of his house and his status in the village. With help from the bank, he got the money to buy one. He has to earn the money back in three years. People from all over the neighbourhood come to him, to charge their batteries. In agreement with the authorities and the bank, Farid has made a little business out of it, to earn back the lend money. He has placed the Stool under a canopy next to his house. To prevent theft, he places it inside his home at night, which is easy, since it is a really lightweight device. Since Farid has his business, his canopy has evolved into a meeting place of people. Every afternoon, they pedal to charge their batteries, they talk about day to day life and have a laugh. Since Farid's place is close to the central square, a lot of people are walking by every day. They trust Farid with the Stool, but also check on him not to raise prices. If he would misuse his position, he will be punished by the authorities, who still have the power over the project. This form of social security comforts the villagers, as they feel bonded to the project, since it involves all people from production to implementation.

Scenario 4

In Bukawa, nowadays every house has its own Pedal Power Stool. Through a lease program, set up by the SEDG and the local bank, every house is able to have a Stool, a lamp and a battery for a lower price

than they paid for lighting before. A weird kind of quietness has fallen over the village. In the last year, the number of accidents related to lighting has decreased. There are a lot less fires in houses. Also, less people are hurt in kerosene related accidents.

Although these are all positive aspects of the new system, there are also downsides. At night, it is a lot quieter in the streets. All the people of the township are staying inside most of the night. They are gathering around the new LED lights with their families, but not elsewhere. If they need to charge their battery, they go home as soon as possible to pedal there on their Stool. The open spaces in the town are empty; people are more and more focused on their homes. The town will never be the same again.

Scenario 5

Gadin is taking care of his old father. Every evening, right after work, he visits him before he goes home to his wife and children. His father is old and stiff, but the company of other people is keeping him up. Since his father is not able to move that well, Gadin is taking care of his father's lighting. His father had saved some money to be able to buy a battery and a lamp, but Gadin's task is to charge it every now and then. Sometimes he is not able to make it, so he asks his wife to do it, but most of the time he can do it himself.

Gadin is working at the metal workshop. He is saving for his own Power Pedal Stool. He can get it for less money, because he makes the frame of the Stool. Until he can have one for himself, he visits a close friend of him, who has one. During the pedaling, they discuss the latest news. Gadin is always free to drop by at his friend's. Not everyone is, however. Gadin's friend does not want everyone to use his Stool: he paid enough money for it, but for Gadin and his father he makes an exception. People, who don't have access to a Stool at home, need to go to the Community Center, where there are a couple of Stools for public usage. Gadin sometimes goes there when he has some time off. The queues are long there, but since a lot of people come there, it is bearable. He meets with friends or makes plans for the evening, while he is waiting his turn. But since he has to visit his father, he can't be making it too late.

REMCO KASSELS

Fields of Opportunity: water bassin, shop

Water bassin

1

The children Mkana and Mkonka are coming home from school at 13:00. Because they behaved well according the teacher Mponko they may come along with Mkongo. The children are looking forward till they go to the water basin. When it's 15:00 pm the children are exciting because the can play on the peddles. They like it because they can play on it and if they do it well, they get one candy from their mother. 20 minutes later, they arrive at the water basin and the children are happy because they can play now. However Mkongo is doing the laundry, the children are playing on the peddle machine. Now the children are busy so Mkongo doesn't have to take care for them and they charge the battery. Mbamba, the owner of the peddle machine gets the money from Mkongo and he takes care for the children and makes jokes with them. 15 minutes later, Mbomob arrives lonely and she changes Mkongos battery for her own battery. Now Mkongos children are charging Mbombobs battery while they are playing. Mkongo is happy that her children can do that for Mbombo because she is always good for her and she helps Mkongo if it is necessary. At 16:00 Mkongo is leaving the water basin with the clean laundry and a completely charged battery and happy children.

2

Mgongo is going to the water basin in the noon to pick up water for diner. She leaves the children at home so she doesn't have to take care of them. When she arrived, she picks up water and walks via another way to her home. Now she came across the peddle machines so she can charge the battery up. Luckily it is quiet at the peddle bar so 15 minutes later she leaves the bar. When she walks back to her home, she sees her friend and they walk together back to their houses.



3

Mgongo needs some water, but also a new battery. Her neighbor needs the same so they decide to work together. Mgongo take care of the water and takes two jerry cans with her and her neighbor Mbamba goes to the peddle bar. 30 minutes later they meet each other again and they trade the charged battery for the full jerry can.

Shop

1

Early in the morning, all adults wake up; the men are going to their work and the woman for the groceries. This time Mkongo needs more then groceries because the battery is empty. Therefore she brings the groceries back to her home and brings the children to the school. After this, she walks again to the market to charge the battery. She goes to the peddle service where she meet the service boy. He started his own small company to rent peddle machines and he also trades the batteries. Because Mkongo has much time left she decides to wait till she can peddle and while she is waiting she can have a talk with her girlfriend Whamama. While the time is leaving, a few more girlfriends are coming and they forget to peddle so 45 minutes later, no one has charged her battery, but they have a good time with each other.

When the children come inside at 17:00, after they have played soccer the whole afternoon, Mkana comes up with an empty battery. Because there is not much time left.

Because it is very busy she decides to change her own battery for a new one. Now she has to pay 0.05 \$ more but now she doesn't have to peddle by herself. The employee of the market started his peddle service so he earns money by cycling and renting the peddle machines. Therefore everybody knows him and has much respect for him. ⇐⇐

2

Mgongo is all day working in house and cooking and she takes care for the children. Therefore Mfongo has to charge the battery up. He does this after his work because he works on the market. Early in the morning he builds the market and the whole day he helps the market people with the cargo. Because he works for the market, he is allowed to charge his battery up for free. Therefore he bought a second LED for his children. This is a smaller lamp and needs less often to be charged.

3

Mkana has a day of from school so she can help her mother. First she helps cleaning the house and then she has to go to the market. She buys vegetables and a 30- minute ticket. With this ticket she can use the peddle machine for 30 minutes whenever she wants. Mkanas mother told her to use it very short so she can peddle very fast. Tonight when her dad comes home he uses the peddles also for a short time. When he comes back from peddling, diner is served and they eat under the LED light.

GUIDO KNOOK

Fields of Opportunity: Community Centre, Workshops

Scenario 1 – The community entrepreneur

It was once again a beautiful day in Bukawa, the wind blew up some dust as Mambazo, a community member, was walking towards the community center. He had heard from his uncle, who worked in the steel-shop, that they just finished the first batch of 5 paddle power chairs. These were sent to the Community Center where people could buy a LED-lamp which would illuminate their houses in a safe way, or so the posters said all over Bukawa. These posters also talked about a unique opportunity, namely buying one of these paddle power chairs, which of-course requires an investment. This investment would be provided by the LA. He was going to the CC to get to know more about this 'opportunity'. Perab, the leader of the Community Center, was just explaining the concept to some fellow Bukawa residents.

'So when you have been approved the micro-loan, one of these machines is yours and you can rent time on these machines to the community, giving you an opportunity to make some money, and the rest of

Bukawa the joy of non-hazardous light!' Perab said.

Mambazo still had some questions, so once Perab, also one of the oldest and most respected men in the community, acknowledged him he asked where they were going to store these machines.

'Good question Mambazo, we are going to have to find a place for this. So do you have any suggestions?'

'How about leaving them here?' one of the other interested residents said.

'We don't have the room for that.' Perab said.

'So we need a room where we can put all these chairs and were people can use them to recharge their batteries for a fee.' Mambazo said.

'Exactly,' Perab said 'How about making a shop for that purpose.'

Scenario 2 – The hard worker

'Argh..' Wasan exclaimed. 'I want to finish the project but there is no way with the sun setting already!'

'Why don't you use your lamp then?' his apprentice asked. 'That will give you some light for at least another hour.'

'Yes I could, but this project won't be finished in another hour, and the shop is already closed! Besides, with the Har family's house burning down just last week I'm not so eager about them lamps anymore.'

'Go get me two of them new electronic lamps them be talking about lately, the community center is open still!...' The apprentice didn't move, but looked at Wasan questionably. 'What are you waiting for boy?'

'I don't know Wasan, I don't really trust them lamps all new and such, how are you going to recharge them?'

'My son has been able to invest in one of them paddle things, I bet he will let me charge for free. Here is \$25, go before I smack you!' he laughed.

Scenario 3 – The community center music night

'So are you going girls?' Sena asked. The group of girls giggled, he had been one of the most desired boys of Bukawa. 'We are not sure yet' Mavena, the leader and most beautiful of the group answered.

'I'll get the boys if you are coming as well!'

'But Makur said he wasn't coming.'

'Well, let me worry about that. Just come, anyway if no one is there, you live next door just go home.'

'I wanna see them disco lights!' one of the other girls giggled.

That night all the youngsters of Bukawa gathered at the community center. After some dancing under the flickering LED-lights, one could go to the bar to get a drink and sit on one of the recharging chairs. Because the stools were continually occupied batteries were recharged during the party, providing not only for hours of fun but also for a fully recharged inventory the next morning.

Scenario 4 – The musical commercial

The Community Center choir had been invited by the local radio station and Nana to repeat a song for the first commercial which would be locally broadcasted. Miguel and his fellow choir members had been practicing twice a week for more than a month now on the song 'this little light of mine'. It was still going through his head all the time as he walked to the media center; '...I'm goanna let it shine, everyday, everyday, everyday...' When he arrived at the media center the last of the flyers were just rolling from the press. They had really made work of this project.

First the whole song was recorded and afterwards local actors recorded some lines of text which then would be mixed into one great radio commercial.

For their effort, everybody in the choir, in fact everybody involved, got one light and one battery to illuminate their homes.

SERGE MEIER

Fields of Opportunity: Public Spaces (park & road)

Scenario Park 1

Raback and Omaba are walking from school to their homes and as soon as they arrive at home their parents give them the battery. They already discussed at school that they will meet in the park where multiple Pedal Power's are placed. Arrived at the park they immediately connect the battery and jump on the 'bike' to join their fellow students.

The kids got their own competition in who pedals fastest. After charging the battery they play soccer for a while and head home because darkness is falling. Once home the battery will be installed for the led-lighting.

Scenario Park 2

While taking a walk in the park Mawala spotted two elderly people who have trouble using the Pedal Power and decides to help. When he is finished charging the battery he got a dollar for helping them out. He came up with a brilliant plan to earn some extra cash by pedalling for the people who couldn't do it themselves.

Scenario Road 1

When Yunaz took a walk along the road he saw children play with an old battery. Many people don't know how hazardous lead can be so he decides to start a campaign to inform the community. He also starts a company in collecting old and broken batteries. This way he creates an opportunity for himself to have a job and for others to stay out of contact with batteries.

Scenario Road 2

While walking through some narrow streets Ghandi saw some neighbours using the Pedal Power. He was still using kerosene to fuel his lamp but was running out of fuel. He decides to buy a ledlamp with the battery because he feels like an outsider of the community. Immediately after the purchase he joins his neighbours to pedal for power and feels a lot better after talking with them.

Scenario Road 3

Mbara was walking home from the park but had some trouble finding his way because of the early darkness in the winter months. Suddenly he saw a light up ahead which was moving closer. It was his brother Mboro who has binded the led and battery to a wooden stick. Mbara came with the idea to optimize the light on a stick by designing a tool with the battery on the inside and the led on the outside. After that he tried to sell the handheld-led to everyone who needed light while walking outdoor.

ESTER PERSOON

Fields of Opportunity: School, Media Centre

Scenario's School

1 – Informing families

Ezbolla slowly walked to school. Every Saturday morning she and her friends gathered at the low building, some 200 meters from her parents dwelling. Here the older sister of Hashan, Ismad, tried to lecture them with the few materials available. "Hi class" Ismad said. "Today I will tell you about the new lighting plan. As said last time we will help to spread the news about the lamps. In the community centre people can come to charge their batteries by peddling. That will cost them 10 cent per session. It will take about the same time as to walk to the old church, some 10 minutes. That will give enough charge to light the lamp for 3 nights. Please tell your parents to come to the community centre for more information. Now, Ezbolla, will you please hand out the new exercise-books, then we can start the math class".

2 – Math classes

"I'm bored" Messa complained to Alvida. "I know" she answered. "But what can we do, class is almost over." "Ok class", the teacher said. "If you buy 6 candles to light the room for 1 dollar each, how much does that cost in total Messa?" "6 dollars" Messa answered. "And if one candle lasts 5 days, how long do you have lighting?" "30 days, or one month." "Very good" the teacher said. "So if a LED-lamp costs 20 cent to recharge, and lasts 3 nights, how many nights can you have light for 6 dollars, Alvida? "I don't know miss." Alvida answered. "Anyone else?" "3 months!" Messa suddenly exclaimed. "That is a huge difference." "And that class, finishes today's lessons." Messa quickly stood up. At the door Messa turned around and secretly gave Alvida a blink and then she took off to home.

Scenario's Media centre

1 – Late night radio show

Finally the last connection worked and Aslan looked up. He noticed his surroundings getting dark. Fortunately his friend Chasim had bought him a newly charged lamp with battery. Turning on the lamp he was able to continue his evening show on the radio. Aslan knew that thousands of people came together every evening to listen to the few radio's neighbors and friends possessed. After a long day of garbage collecting, begging and waiting people could listen to his stories and dance on the music he broadcasted from the city radio centre, thus ending a grim day in a positive tone.

2 – Ill wife and new technology

The coughing of his wife gave Steff a bad feeling. After quickly giving her a kiss he ran to the media centre. "Hi Nubi. Can I come by your house this evening? We have no more money for lights and me wife will stay in bed all night." "Off course you can come over Steff. IS she coughing again? You're always welcome and with the new lamps we have enough light for the whole evening." "You have one of those new lamps?" Steff exclaimed. "I'm so curious! I'll see you just for sunset." "OK" Nubi answered. Later that evening Steff came to Nubi's house. "How did you ever get the money to buy one?" he asked. "We saved some money by not buying kerosene and sharing with the neighbors. After a few weeks we had the money to buy the first lamp. As you see it gives enough light for the whole room." "I see, what an invention, but how do you charge it?" "At the supermarket you can buy a new battery, just for a little bit of money if you hand back the old one. It is a fantastic service, you should join." "I'll think about it." Steff answered. "Let's get inside and have a drink." Nubi invited.

3 – New posters

"Caddy, Caddy, have you seen those new posters?" "Off course I have Jack, I've printed them." "So is it true? Are those new lamps cheaper? I personally doubt it. And even if it is cheaper you have to buy it in one go. That's more than 70 dollars. If I had that much money I wouldn't live here!" "You stupid boy. If you had stepped into the community centre it would have been explained. You only buy the lamp and the battery. Then you take the battery to the peddling machine. There you pay a little bit and you can charge the battery and take it home. No more dragging of jerry cans and black smoke in your house." Caddy answered. "Ah, I see" Jack answered. I wish I were that smart."

APPENDIX C - INDIVIDUAL SCENARIOS MODULE 2

JORN DUWEL

Water basin & Family

Scenario 1

Paul is walking home from work. He is thirsty and should get some water for the rest of the family. At the water basin, he is finding out something terrible. There were probably some children playing around at the basin, but they left a lot of mess. Paul sighs. With these new containers around, why don't they just throw away all of their old stuff when they are done playing with it? He looks around to see if he can see the ones responsible for it, but he can't see anyone. Since the new garbage collection system is in effect, it is a lot cleaner in the neighborhood. People seem to take more responsibility for their garbage. On top of that, simply handing the garbage in gives people some more money, because Nane pays everyone a bit.

Paul picks up the trash and walks to the garbage collecting center. Some people are gathered there and Paul talks to them. The center has become a meeting point for all kinds of people. Some are there just for fun, others hope for some tip where they can find some garbage. This way, they can earn some money to eat. When Paul has handed in his found rubbish, he gives his little extra money to one of those people. He has a job, so he has money enough, and since he found the garbage, he thinks it is fair to give it to someone who needs it more than he does.

Scenario 2

Thomas wakes up in the morning. He is still feeling tired, but he has to get up to go to work. The room is quite a mess. Before he leaves for work, he asks the children to gather all dirt before he comes home. Thomas collects garbage for the Nane garbage collection system. He gets paid to collect a specific material from the garbage dump. Every morning, he gets told which material he should collect that day and who he should gather it with: they always get out in teams of two. This way, everyone has some company while working.

When Thomas gets home at night, he sees the house lit by his new LED light from far. He gets in, and sees the children sitting at the table. In the corner is a pile of garbage. "Come here, kids!" he says. "Now look at this stuff. A lot of it is plastic. This can be used to make bags from. Your uncle Brian makes them in the newly set up workshop. The other things, like this piece of wood can maybe also be used at a workshop. We are going to hand it in tomorrow! We will get some extra money for it!" After a long night of talking and playing games, the family goes to bed.

Scenario 3

Manuel is working at the new garbage processing workshop. From all over the slum, garbage is transported here. Manuel sorts everything based on material before it is sent on for further processing. At home, he is sitting around with his children. Together, they empty the bin, to see what kind of litter is inside of it. Manuel explains something about the different kinds of materials: wood and metals are valuable, so these should be recycled. Plastics are difficult to process, but when they are handed in, people who are trained in it separate the different kinds of plastics. Manuel makes a game out of the sorting of the garbage. He has made 4 different bowls from 4 different kinds of waste material. He teaches his kids to recognize the materials and put it in the right bowl. When they do it correct, they have to do less other tasks around the house. The children think it's fun, they like the game and they even try to invent other game for themselves. Manuel loves to just sit in a chair and watch them. Tomorrow is a new day of sorting materials

for him. Luckily, his kids make his job a bit easier.

Scenario 4

The water basin has gotten really polluted over the last couple of months. Although people get sick of it, no one takes the initiative to do something about it. Everyone is really pointing at each other. As a promotional action for their new CIPS, Nane organizes a big cleaning event around the water basin. With help of some villagers, the people from the local SEDG are taking all the garbage out of the basin and install a water filter to clean the water. People become more aware of the fact that they should keep their slum clean together and watch out for each other's trash. After the event, people are eager to use the new CIPS, because they are really motivated to keep their slum clean.

Scenario 5

Tjongo is a young father of two kids. He wants to have a job, but he just isn't lucky enough to find a stable job. With the new Nane garbage collecting system, he has found a new opportunity to earn some money. He is collecting all his neighbors garbage and hands it in at the Nane garbage collecting point. He gets some money paid per kilo garbage that he hands in. Before he could do this, he had to get a license from Nane to collect garbage. He got tested in various ways, so the people there knew he could be trusted. This way, he gets some respect from his community members.

At the water basin, a big collection device is places. People can throw in different materials already separated. On the unit, there is some information about how the material can be used in producing a bag. The bags, created from the old materials, are being sold to a big department store in the Netherlands. Because people really see how much they hand in together, people become more aware of what they are consuming. They look after their waste disposal and try to minimize it somehow.

REMCO KASSELS

Shop

It is early in the morning so it is not so hot so Kwama can walk relaxed to the shop. She will do the groceries for today and now all the vegetables and fruits are fresh. While she is walking, she Kwaka calls her name. "Hi" Kwaka says when she moves closely. "Hi dear" Kwama says. "Where are you going?" Kwaka asks. "I will go to the shop for new needles. I used them to connect different parts for the bags I make" Kwama replied. "Oh that's quite clever to do, I used always iron rings that were open. I bend the rings a little bit to connect the parts and than, I bend them to the original state so the parts are bonded. Kwaka says. "I am very curious about your bags, may I see them in a while?" Kwaka asks. "Of course! And I want to see yours to and maybe we can learn from each other" Kwama answers excitingly. Together they walk to the shop to look for materials. Kwama buys the needles and then Kwaka and she asks if Kwaka needs needles too. "No, I will look at the community center for a needle or different ways of connecting" Kwaka answers. Than they walk both to the water basin to get some water for Kwaka. "Do you need also water Kwama?" Kwaka asks. "No we have got enough for today, because Tongo, my husband went yesterday evening" Kwama answered. "Oh okay, that's nice" Kwaka says. Then they decide to go to their homes to wake up the children and have breakfast.

Shop

It is 18:00h pm and Kiki hears her mother calling her name. "oh no, I have to go for dinner" Kiki says to Kono. Kono says: "I will go with you, I think that will eat soon also". Together they walk to their homes, they are namely neighbors. After dinner Kwama says to Kiki: "Go to Kono and ask if he want to go with you to hand the garbage in okay?" "Yes, of course Kiki answered. When she arrived at Kono's place, she



sees that they are just finished. "Are you allowed to hand in the garbage with me?" Kiki asks. Kono looks to his mother. "It is okay my darling, but keep together" Kono's mum said. "Thank you" Kono and Kiki say similar. "Let's go to my home to pick up the garbage" Kiki says "Is it valuable?" Kono asks. "I do not know, I only know that there are a few plastic bottles and a few plastic bags" Kiki says. "And have you got strong materials like wood or metal?" Kono asks. "No mum said that she will use it by herself, so we do not have to hand that in" Kiki says. If they arrive at the shop, Kono says: "Oh no it is very busy I see". "Well well, it's not so bad, they are just chilling, so we will be ready very quick! Trust me." When Kono and Kiki enter the store, they see that it is quite calm at the emballage desk Kiki hands in the garbage and asks how much money she get. "I will check it for you darling" Doyo says. "How are your parents Kiki?" Doyo asks. "They are fine" Kiki replies. "Mine too" Kono adds. "That's good to hear, and hear is your money, 0,67 dollar cent" Doyo says. Then, Kono and Kike went to home together.

Community Center

Today it is very busy at the community center if Kwama arrives. She enters the room and says hello to her daughter and her girlfriend. Bona and Julia says hello at the same time. "Are you having fun ladies?" Kwama asks. "Yes, how do you like our bags mum?" Bona asks. "Oh it looks very nice ladies!" Kwama says exciting. "And let me see the connections girls, if they are good, we can sell the bags and you both get a little money, because you earned it" Kwama says. Now we have to go home because daddy arrives soon and I want to haver dinner ready before he arrives. So ladies do you want to help me?" Kwama asks. The girls like it and decide to clean the table. "Mum, can you carry some bottles for me, because I cannot carry them all" Bona says. When they arrive at home, they all start cooking and Bomo arrives at 19:00h p.m. "What did you do today Bona?" Bomo asks. Excitingly starts Bona to tell: "I went to the CMC with Julia and we start to make a bag and it is almost ready to sell". "And do you think it can be sold for a high price?" Bomo asks. "Yes of course!" Bona screams. "I hope it, so you get your own money, how you like that?" Bomo asks. "Oh do I get everything daddy?" Bona asks. Bomo explains that she cannot have it like that, because she worked together with Julia. "so you both get a part. And because you found the materials, we do not need anything my girls"

The next day, the girls finish the bag and together with Kwama, they go to the CMC. They sell the bag eventually for 1,30 \$.

Community Center

Before the sun rises, Bope wakes up for his work. Bope works for his own and rents every day a car at the community center. When he arrives at the community center, he sees his friend Bambo. "Hi Bambo" Bope says. "Hi my friend" says Bambo. "Shall we work together, than we can go to the dumpfield out of the slum?" Bambo asks. "Oh that is a good idea" Bope replies. "Alright, lets rent a car and move out the slum" Bope says. When they go to the other slum, they pick up garbage. Than they arrive at the dump field and start searching. "Oh I see much plastic bottles Bambo" Bope screams. "O I will come to you!" Bambo screams. Bambo pulls the car to Bope. "Help me filling the car because if we work hard, we can deliver it and come back in the noon". Together they work very hard. In the noon, they go back and while they are traveling, they meet much villagers. "Here you got some more garbage" says a young woman. "Thank you darling" Bambo says. Bope laughs because his friend is always very gentle to young women. "Do you like her Bambo?" Bope asks. "Bambo starts smiling and that's says more than thousand words. When Bope and Bambo arrive at the bag shop, they get 3,26\$. They are quite happy with the result, knowing that it is just 14:30h. "Shall we go back?" Bope asks. "Yes will have to says Bambo" "Why?" Bope asks. "Bambo explains that if they work hard, they earn to go to the bar and a cold beer taste the best after a whole day working. "Aha, You are right" Bope says. They go back to the dump field and meet a few other garbage men. "They have a small talk and at 17:30h they go back with a half full car. Because the material is very valuable they get 2,-\$ and than they go to the bar. At the bar, they meet there other friend, who are done for today. "At seven o'clock they go to their home to have dinner.

GUIDO KNOOK

The school

Scenario 1 – The first day of the new project

‘Where is everybody? Class started an hour ago!’ Makabe asked the two girls who did show up in time. ‘I think they are making bags at the community center, Nane started a new project there’ One of the two answered.

‘But they should be in class! I will go and talk with Nane to see what we can do about this!’ He said stubbornly, however just at that moment all the kids came in with one of the Nane employees. She walked up to Makabe and suggested to give a workshop about the new project and explained that it was all about waste management and giving the community members a chance to produce their own products and sell these.

‘Alright, how about tomorrow? I guess the kids already know more about it than I do but I will introduce you and you can give the workshop.’ ‘Yes, that would be great! Bye!’

‘Kids, take a seat, then we can make up for the lost time!’

Scenario 2 – The workshop

The Nane employee got in and Makabe motioned the children to be quiet. ‘You have all heard about the new Nane project, today Malem is going to explain to all of you how you can make your own new school bag from the waste which I asked you all to take with you.’ ‘Thank you Makabe, so show me the waste kids!’

The kids laughed but did not hesitate to show what they had brought. ‘First things first, we have to get the dirt out because we are not able to use that. Let’s all go outside, I brought some filters to realize this....’

After a whole day of intensive but fun work almost all the kids had finished their new schoolbag. ‘Thank you all for your attention and motivation, I found it an inspiring day and if you liked it as well, you can make more bags at the community center and make some money with it as well!’

Scenario 3 – Waste Collection

‘I’ve already got a whole bag full!’ Serengi exclaimed. She was one of the more successful in waste collection of the children, normally however she doesn’t like to poach but one whole bag in half an hour was something to be proud of. The bag was made out of the very same waste she was now collecting. She had made it during a workshop at the school, and her teacher had encouraged them to use it not only for school but also for more collecting so they could make some money and keep the slump clean.

‘That’s because she has a pretty face, I bet I would have 2 bags full with such a face’ Simba said, he was a few years older than Serengi but they attended the same class. Serengi didn’t react but jumped into another alleyway to collect some more waste.

Scenario 4 – Media Center

Azber, the owner of the Media Center, was very happy that Nane had created such a buzz around there Pedal Place project. They had spent quite some money already promoting this project and now even



entrepreneurs from other communities were coming to his media center to print their promotions. It was therefore, and because the new project had just been announced by Nane, that he had hired two more people to help him run the media center.

‘Morat, get me some paper for the new posters!’ Azber said. ‘Making bags from waste, I love it, how do they come up with this? Ow and take Bala with you.’

Children are enthusiastic about the project

SERGE MEIER

Scenario Park/Road

1

While taking his daily walk to the park Amrabat sees some children looking for something on the ground, he decides to take a closer look to see what they are searching for. Because of his old age his eyes are not capable anymore of seeing things from a great distance. Eventually he saw that they were picking up pieces of bottles and other sorts of garbage. He pitied the children standing before him, still have to search for garbage for their parents so they can provide for their family. He walked back to his home and visited his daughter who also has 2 children. “I don’t believe it, children are still looking for garbage down the road!” Amrabat says. Jali started laughing and explained to Amrabat what they were doing. “They are all looking for garbage which they can use for the new project at the fabric atelier” Jali says. Amrabat didn’t quite understand what she ment and asked what the project involved. The children can use their own garbage to produce handbags in cooperation with some asistants and the bags will be sent to Holland where they are sold at a shoppingmall. Amrabat was relieved after hearing the news from his daughter and started to collect his own garbage and gave it away to a couple of children he saw in front of his house. They thanked him a thousand times and ran off to the fabric atelier for another workshop in producing your own bag.

2

Hari had some problems finding the right garbage for his new bag. He wanted it to be different than all the other bags so he would earn more money when selling it.

He decided to ask the help of Gabi in his search for the right garbage. Gabi was head of the Mediacenter with his own broadcastingprogram. “I just don’t know where to find enough cans to complete my unique bag” Hari says to Gabi. “Just give me an example of what kind of cans you need and I’ll spread the word throughout the radioprogram tonight to deliver cans to your place to help you create the perfect bag” Gabi answers. “Superb! I’m gonna need all kinds of cans, as long as they are made out of metal and no plastics!” Hari answers. That same evening he listened to Gabi’s radiobroadcast and heard the request for him, Gabi asked everyone to go out on the street to help Hari search for his cans. He was overexcited and hoped that there are a lot of people listening to it. The next morning he woke up in a rush, feeling a bit nervous but still very excited. He opened his door to get to work and found an enormous bag full of old cans! “Yes, it worked!” Hari shouted. This will do just fine for my project, and maybe even for another project! He stuffed the bag with cans in his closet with the other cans he collected and decided to start his project after his work today.

3

Eve just couldn’t believe it! She has been in this community for the last twenty years or so but times have changed completely. The streets used to be a place where people would only walk and try to avoid all the garbage but ever since Nane set foot in this community things are all different. Nane introduced a new system for garbagedisposal which was revolutionary and worked perfectly. She was proud to be

the wife of Tah because he leads the whole program since the introduction. A year ago, nobody would have recognized her in any way and now she gets a good welcome everywhere she goes. Things have definitely improved around her. Kids were able to play on the streets and in the park again without trashing the garbage or getting hurt stepping on cans. She's on her way to her work, the fabric atelier, where she started a few weeks ago. She got the job after an artwork she made out of garbage and now she produces unique bags out of the retrieved garbage from the streets. There was plenty of work to do because all the bags they made are already sold in Holland. The bags made out of garbage are wanted everywhere! Her speciality was rags with little peaces of plastic scathered around the surface. The people she worked with loved those bags and always pittied the fact that they have to be sold again. She earned a dollar with every bag she made and she was getting better at it every day. In the beginning she made one bag a day, but after a few weeks it's possible to produce two bags a day and even start with a third.

4

Juan was on his way to the garbagebelt with his cart when he ran into Julia. "Hi Julia, where are you going to?" Juan asked. "I'm looking for my father, he said he would be around!" Julia answers. "Well you can always join me to collect some garbage and hand it in at the depot?" Juan said. "That sounds like a good plan Juan!" Julia answered. They head off to the garbagebelt in hope to find some usefull materials for the bags that are made out of it. When they arrived they find a couple of plastic bottles and some metal cans which they put in the cart. After a while it was completely filled with garbage so they decided to head home! On the road they had to ride through some rough terrain, they lift the cart on both sides. Once through the rough terrain and in the slum again Juan and Julia said goodbye and agreed on dinner later on the evening! Juan moved on to the garbagedepot and got his fee for the garbage.

Together collect the garbage

ESTER PERSOON

Scenario workshops

Too many people, explain rules

"Hai lalla, how's your day?" "Tiring. Everyday new people come to work on their bags. Everyday I explain the same rules: Do not take any tools away, share your table, selling is over there, you should have bought your own materials, and so on... tiring in short." "But you know just as I that there are just too many people coming from neighboring communities. And those women, they just come to chat and occupy all the workspace." Diss replied. "I better go over there before that small boy nicks the hammer. See you later" Diss said as he walked over to the boy.

Garbage sorting for workshop

With the sun rising a new day in Bukawa started. Josh and Suzet together walked to the low building behind the central square. "So did that thunder tonight wake you up?" Josh asked Suzet. "No! I'm no sissy!" Suzet flares up. "OK, no need to get so fired up. Shall we go to the sorting centre?" Josh asked. In the sorting centre a huge pile of garbage, which had been bought in by the other tema, was being sorted by some twenty people. Josh and Suzet take their place and start sorting. After some three hours 'the boss' Jacob calls them. "You Suzet and Josh, bring all the iron and metal to the workplace." "Woei, finally a break." Josh said as he started to stack all sort of tubes on Suzet's arms. Together with Jacob they started to walk to the nearby workshop. "Hai John, here is some more metal to work with. As you see, all usable. In total 2 dollars and 30 cents. It's all the metal I have for now." Jacob told John. "2 dollars and 30 cents... that's a good deal and I need the metal. Put it in that corner over there boys." John answered. "Will you stay for a bit Jacob?" John invited. "Yes, that would be nice; you kids go back to the sorting place."



Scenario homes

Find a piece of cloth

"Mum, mum, look what I found!" Ezrad called to his mother as he came dashing into the house. "I found a huge piece of sailing cloth when searching for metal. You can easily make two bags out of that." "We'll see. This hole is not really handy but we can use that blue piece from yesterday for that." His mother replied. "Go fetch your aunt Sunshy so she can go to the centre and start today. We need the money we can earn by selling it." Ezrad once again dashed out into the blinding light and Inquella turned back to her molding of the bread.

Garbage sorting for personal use

"Nelson, is it time already?" Madria sleepily asked her husband. "Hate to disappoint you but I have to go darling. If I turn up early I might find something valuable. You know I only earn 15 cents an hour, but metal pays much more. Furthermore I heard that Ukah is not coming today and as he always finds the best pieces I have a good chance today!" Nelson explained. "So how long will you make it?" 'I'll be back before dinner, around sunset" "OK, I love you!" Madria answered.

APPENDIX D - INDIVIDUAL SCENARIOS MODULE 3

JORN DUWEL

COMMUNITY CENTER & WORKSHOPS

Scenario 1

Since the introduction of the mobile furniture in the Community Center, there are being more and more activities held. First, it was really a problem that there was no place to sit. People were just hanging around a bit. With the new mobile furniture system, people are having more of a goal when visiting the Community Center. The new furniture is bought by the Community Center. People are free to use it, so it is used a lot. In addition to just sitting on the furniture, games can also be rented at a special desk. These games can be used with the mobile furniture to have a good time. People like to come to the Community Center to play a game. Imran for example, likes to play a game of checkers with some of his friends. The mobile furniture is an ideal tool for facilitating these kind of meetings. Also, Nane, the initiator of the mobile furniture system, organizes game tournaments for the community. Prizes are made available by the local workshops. Imran won the checkers tournament last week. His prize was some good quality wood, which he can use to make something he needs in the workshop. "It's not food," Imran says, "but at least I can now repair my bed. It has been broken quite some time, I had no money to buy wood to fix it."

Scenario 2

John is working at the wood workshop. He has been assigned the task to produce the mobile furniture. He is looking forward to it, since it will earn him a lot of money. If it becomes a success, he can live off of it for at least a couple of months. The designers of Nane have instructed him properly. A couple of meetings have taken place, in which the designers told him what they wanted, but he was also asked to give feedback on the produce ability of the design. "They were really productive sessions," John recalls. "The people of Nane really listened to what us craftsmen thought and wanted. They edited the design thoroughly based on our comments. I'm not used to people really asking for our thoughts."

A month later, John is really busy working on the mobile furniture. "I want to have one of these for myself," he says. "I can use it in my workshop. It is really handy to use around an object I am creating. It is flexible, so I can move around the object pretty quick to reach everything I want. Besides, when in a formal meeting, like I had with the people of Nane, I can use it around my table, just to sit on. I really think it can increase my productivity."

Scenario 3

Arbijan is working for Nane. He is organizing a workshop at the local Fabric workshop. In cooperation with local artists, attendees are supposed to bring their piece of mobile furniture. Together with the artists, they are going to decorate and paint their furniture. This way, they can create a feeling of cohesion with the community. The workshops are fun: people are laughing and chatting while they are painting. Arbijan is happy: "I hoped it would be a success. It is always waiting for what happens. Last month, there were very few people attending our metal workshop. It turned out the posters we printed were not hung up in the Community Center." Arbijan is an employee of Nane: he gets paid to organize the workshops. Why would other people attend the workshops if they don't get paid? "Well, it's easy," Arbijan says. "The workshops are free. All the instructors and materials are paid for by Nane. People are just expected to show up."

Scenario 4



Serge is entering the Community Center. He wants to have a picnic with his family, so he wants to borrow the mobile furniture. At the Nane desks, he is informed about the system. "You pay a small fee to us, than you can lend the mobile furniture for a whole day. At the end of the day, you need to bring it back to the depot at the back of the Community Center." Serge likes the idea. He pays the fee walks to the depot. We easily takes the furniture with him and walks home. His wife already packed everything. The family walks to a beautiful spot near a lake and places the furniture there. They can all sit around it. At the end of their picnic, they all walk back to their slum. Serge hands in the furniture at the depot. "It was worth the cost, definitively!" he thinks.

REMCO KASSELS

MEDIA CENTER

"It is done!" Yeki calls. Yeki is a designer and has learnt to work with a computer and graphical programs. He was very artistic and wants always learning. Therefore, he get a job at the media center. Before he could start working, he was taught in graphical designing. Because the poster, he made, is done, they can start promoting the first cinema evening. This evening is organized by the media center because they own a beamer and a DVD- player. Yeti walks to the printer, to print the poster twenty times. "Will you glue them on the walls in the village?" John asks. "Yes I will do that immediately" After an half an hour, Yeti goes outside to inform the villagers about the cinema evening. "Hi Yeti! What are you doing?" Donna asks. "I glue some posters to walls" Yeti says. "What is it about?" Donna asks. "There will be a cinema evening about one week. The film is for children but also for elderly. So you are also welcome!" Yeti explains. "Oh that would be nice"

One week later

Yeti and John are standing behind the desk and rent mobile furniture. Much families let sit there children together at one couch so they can split the costs. When it become more and more busier, John helps the people to place the couch. After one hour, it is almost full and they decide to start the movie.

Media center gebruikt stoelen voor bios avonden

At 11 o' clock John goes to his work at the Media center. When he arrives, there are waiting 2 persons to rent a couch. "Hi there Obi" John says. "hi John" Obi says. "Hi Kunta" John says and Kunta greets him to. "What can I do for you?" John asks. "Now, we want to rent 4 couches because we have a party tomorrow". I will see if that is possible" John replies..... "Yes it can' John says. "Alright, when do you want to pick up them?" John asks. "Tomorrow in the noon around 2 o'clock, is that okay?" Kunta asks. "Yes that is okay" John replies. 15 minutes later, the boss arrives and tells John that next week on a thursday night, each couch necessary is because of the cinema evening. John writes it down in the book so he will not forget it. Today it is not very busy and therefore John decides to clean all the couches. But just when he want to start, Terri arrives to bring 5 couches back. He first came to see if the desk was open and says to John:" I will come back with my friend and I will bring them one by one okay?" "yes that is okay Terri" John replies. "Meanwhile I will clean the couches alright?" And when you bring them all we can pay off alright?" "Yes, that is good" Terri answers. One hour later the five couches are bag and Terri has paid them off.

FAMILY

It is 19:00h and Jack is ready with his work. After his work he goes to his brother because they have planned to help for the meeting. This evening there is a meeting at the center of the village about new medicines. Everybody is involved and therefore it will be very busy. Jack and his brother Benny will guide the evening because the much couches will be brought to the evening. "Benny! Will you bring your couch also with you?" Jack asks. "Yes I take it with me, just for the children" Benny replies. "Is it okay if I leave min eat home?" Jack asks. "Of course, your children can sit on my chair with my boys" Benny says. Slowly it becomes crowded and Benny and Jack tell everybody where they can put there mobile furniture

devise. "Hi Benny, can you tell me where my couch can be placed?" Angie asks. "Of course, I will help you so everybody has a good view". Benny says. While Benny is helping Angie, Jack helps a few children. They have do not know where they can sit, so Jack points a place out. "Thank you" they all say similar. "You're welcome" Jack says. One hour later, everybody can sit on the mobile furniture and Jack and Benny are satisfied. The meeting take no longer than 40 minutes so after the meeting Benny and Jack guides everybody to there home.

Broers helpen met organiseren van bios avond. Zorgen dat alles goed verloopt want velen nemen eigen banken mee

Today it is Friday and every Friday the family Goodman will meet at someone's place. This Friday it will be at Jacks home. Jack is waiting at the fence. "Hi uncle Jack" screams Lodi. "Hi Lodi come to me" says Jack. "Look to my new jojo" Lodi says. A few minutes later, Benny comes with his wife and other three children. Benny carries the mobile furniture and on that there are the children. "Now you will become strong" Jack says laughing. "I am already strong" says Jack. "And your children are lazy bastards" Jack replies. "That is true" says Benny. His wife Nana nods. "Well I will open the fence for you" says Jack. "Oh that is nice bro" replies Benny. Benny walks to the children of Jack and places the couch outside in the garden. "Now you can sit also outside little boys." says Benny to his cousins. Meanwhile, his cousins climb on the couch next to their cousins. "Do you want a drink Benny?" asks Jack. "Of course and you know what I like, right?" says Benny. "Of course, a glass of "Jack" with one ice cube." Jack answers. Then Nana walks to Lana to have a talk. "Have you seen our new mobile furniture?" Lana asks. "No, show it to me!" Nana answers. "We bought it yesterday at the woodshop, and is featherweight, but strong!" Lana says. "Oh I like it very much" says Nana and she decide to sit on it. "It sits also comfortable" Nana says. A few minutes later, the men come back out of the kitchen and accompany the women. Around ten o'clock Benny and his family goes the their own house.

GUIDO KNOOK

ROAD & WATER BASSIN

It started as just another day in Bukawa, the sun rose just as it had the day before, however this day was different. Everybody in the little community was just a little more excited, Mohram felt it in the air, which pressed on his sweaty body like any other day. However, because of the excitement he could bear the warmth better than normal.

"Is everything ready?" Baboo asked.

"No, we will still need to bring the furniture up to the water basin." Mohram answered.

Nane and some sponsoring company he had never heard about had placed it there to show the whole community what would be done during the following few months when Steven Spielberg, The Steven Spielberg, it's ridiculous, would come to maken a movie about their community and the positive projects that have been introduced in the past few years. A little bit of shameless selfpromotion there of Nane, but i guess they did a good job. Mohram thought. They even talked about earning so much money for the slum to provide for real houses. hmm.. I'll first have to see before I believe that.

"Alright then, let's get some more strong men to get them there!" Baboo laughed.

"Hey man, I especcially made them as easy as possible, even a child would be able to bring them there!" Mohram answered quasi-annoyed.

"Hah, I dear you" Baboo said and he laughed. And thus later that they the whole school class went to the workshop to pick a chair and bring it to the water bassin. The bumbs and other difficulties in the road were easy to avoid and within a few moments Mohram saw he was right. The children were a little tired at the end of the day and thus didn't hesitate to take a bath in the water bassin creating a water festival.

After it had become dark the crowd quickly grew and soon there were few places not occupied by enthusiastic community members. There was a calming buzz of the many people talking quietly among

each other. Guido looked at the people and satisfyingly concluded that they had done a good job. They had grown as a community and had adopted a greater social wellbeing and now the “pièce de résistance” was coming together. The mobile furniture has been produced and the whole community was excited to be part of the film project. Steven Spielberg was here to show them a movie that should be an inspiration to this project and would explain some of the changes that did have to be made in order to create a succesfull film. Steven and Nane had however agreed that it would not interrupt the normal life of the community, unless this would be in a socially positive way. If they hadn't then the whole film would be a hypocracy. Guido thought. Just at that moment the music started and the crowd became silent everybody shoveled to the screen while the intro started playing.

When the movie finished everybody kept silent for a few seconds, it had been impressive. “Alright everybody, let's put the furniture in a circle so we can discuss!” Steven said and just five minutes later the whole community was discussing the movie letting everybody speak their minds.

SERGE MEIER

SCHOOL

Scenario 1

Nadia woke up at the sound of her mother calling her for breakfast but didn't feel like going to school today. She took a seat on the carpet and recieved a plate from her mother. Once finished eating she walked out the door towards school. “Nadia, you forgot your carpet!” Layla screamed. “Ow, thanks mom! I almost forgot it.”. Everybody at school has his or her own carpet to sit on while being teached. Today's thursday, that means that we can make a drawing on someone else's carpet. The last few weeks I really improved my drawing skills so I was looking forward to that. She was hoping for a chance to draw on Joshua's carpet, she really liked him and wanted to express that in a drawing! After an hour of math and one of sexual education they were ready to start drawing! She ran off to Joshua and asked if she could draw on his carpet!? “That would be great Nadia!” Joshua said. After half an hour Nadia was done and very pleased with the result. “Wow, that looks amazing Nadia! This is the best drawing on my carpet!” Joshua said. “I'm happy you like it.” Nadia replied. “Hey, i got an idea.” Joshua said. “Why don't we make drawing that starts on my carpet and ends on yours together?”. Nadia had never been happier and smiled from ear to ear and said: ‘I'd love that!’.

Scenario 2

Today's finally the big day at school. The school recieved 50 square meters of carpet from the SEDG to have the children make drawings on it. They have a full week to make as many drawings as they can and after that it will be divided into pieces at the size a normal person can sit on it. Every child was asked to make a drawing and they had to bring their family along one or more days to also create a drawing because it was too many space for only the kids to fill it up. With full enthousiasme everyone started their drawings and after the first day already 18 square meters was filled with lovely drawings. At the end of the week almost every spot was filled with colors and the SEDG was proud of everyone who cooperated on the event. The next task was for the fabric atelier to divide the carpet into 50 pieces so that every household would have his own carpet to sit on outside. Nobody knew exactly how it would be cut but it will be displayed tonight at a concert of the mediacenter. The whole carpet seemed to be intact but when everybody took a closer look thay saw that it was cut in all sorts of puzzlepieces so that every piece will fit in another piece. Everybody took his place and at the end of the evening they took home the piece they were sitting on. Everytime there's an event the pieces are brought along again by the people and fitted into on complete puzzle.

Scenario 3

“Mom, i'm going to take the chair with me today okay?” Chanel screamed. “Yes, it's okay, I don't need it

today!" Charity answered. Every child on school was asked to bring their chair along so they could play games with it. On her way to school Chanel ran into Yelena, but she didn't bring her chair. "Why haven't you brought your chair Yelena?" Chanel asked. "My father needed it for his work today..." Yelena answered sadly. "Ow, bummer! Well we can play together on mine if you want?" Chanel asked. "Wow, that would be great!" Yelena replied. Once arrived at school they saw a lot of chairs all placed in a circle and the teacher said that our chair has to be placed within the circle as well. "Today is going to be a fun day! We are going to do all sorts of games starting with a chairdance." the teacher said. Everybody took their place on a chair and once the band started playing they ran around the chairs and eventually the music would stop and they have to take a seat as fast as possible. The winner would receive a pack of chalks and pencils.

SHOP

Scenario 1

Everybody was gathered around the supermarket at the presentation for the newest accessoires for the modulesofa. The sofa was introduced a couple of months ago and was a gift from the SEDG for the good effort the community has made during the PP and the garbagecollecting. The sofa wasn't just a regular sofa, it consisted of 20 different seats which could all be connected to eachother to create a giant seating system. The SEDG was still the owner of the sofa, but everybody had the ability to use them whenever you needed a sofa. The first 20 pieces were all the same, but now there's a introduction of some different pieces to create corners. The community recieved 5 corner pieces which they will have to use tonight at the outdoor cinema event. Everybody helped relocating the furniture towards the inflatable screen and when everything was in place to movie started!

charity from SEDG

Combinations possible

ESTER PERSOON

HOMES

Scenario 1

"Hi Alicia, how nice that you had time to come over" Gralley welcomed Alicia. "How was your day?" "Hard, and long, but over now. Let's not talk about it and just relax." "Good plan" Gralley replied. "Please, sit down" she invited. Alicia sat down and exclaimed "you've got a new seat!" "Yes" Gralley answered, "With all the savings due to the new LED lamp we were able to get a new one. The best feature is that you can easily take it outside, to the community centre or the neighbors to just be together. And my mother can sit back and relax and enjoy an evening without having to go to bed early." "How wonderful" Alicia said.

Scenario 2

"Freddy, get of the closet. You will fall down and hurt yourself. I've told you a thousand times by now." His mother told him. "But it we're outside I can always sit on it like this" Freddy whimpered. "Why can't I now?" "Because now there are many more things in it. Outside we use it to watch over the crowd so we can see the show." "OK" Freddy said as he came down. "So when is the next show?" he asked grinning. "The day after tomorrow. You can invite Frank and Hambola to sit with us, go tell them that." "Thank you mum" Freddy yelled while running through the door.

PARKS

Scenario 1

Hadidi was walking towards the park when he already heard a faint music. He started to walk faster since the music meant the party had already started. Finally he came in the clearing and saw an amazing sight. More than a 100 people were sitting on the faint hills. In the front the beamer donated by the SEDG was showing the movie. Quickly he walked to Honray who had kept halve a seat available on the new seats. "Hi Hadidi, you're late!" Honray greeted. "The movie already started, but you haven't missed much. The one guy with the hat was riding his horse through a river and across the land, towards the little house." "Hush down there, WE're trying to follow what they say" someone whispered loudly. "Alright" Hadidi said to the back. "I'll speak to you after the movie" he said to Honray. During the movie Hadidi kept looking around. The new seats looked really well. The whole community had participated in the production for the grand opening. Quite some people were benefitting from the contacts the SEDG had provided by 'de Bijenkorf'. This meant much money came into the community and all people benefitted from that. With all that money being earned the SEDG had decided to provide the community centre with some seats for communal use.

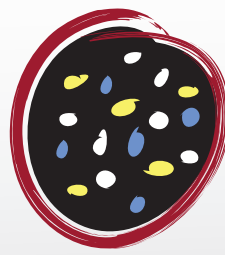
Scenario 2

With the sun shining the muddy spots in the open filed quickly dried up. Hannah had been sleeping on the low seats but the sun now started to shine in her eyes. She had been working in the garbage sorting centre and she had more than an hour before she could go to the city to scavenge for market remains, meaning she had enough time to play soccer with some friends. "Hi Hannah, how was your day?" Tommy asked, and before she could reply he continued "we had math and I knew every question! School is so nice! I wish you could come as well" he said. "You know I have to work Timmy," Hannah replied. "What's keeping Joyce and Sander? I want to start. Lets put up the field. If you move that seat we can make a goal there. I will find a stick for the other goal." Hannah bossed around.

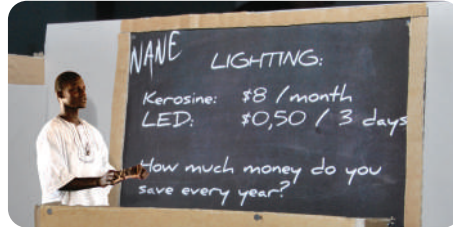
APPENDIX E - PRODUCT PRESENTATION POSTERS

For each module, an A2 sized product presentation poster was made. In this final report, each poster is added on A4 size.

Pedal Powered LED Lighting in Slums



PEDAL PLACE



THE SYSTEM

People pedal for 15 minutes to charge their battery for 3 days. The Pedal Place is situated in a public meeting place, like a community center. Two Pedal Stools are placed there, so people can charge their battery for a small fee. These batteries and LED lights are lend to the villagers.

PROMOTION

Villagers can save up to \$3 per month using LED compared to kerosine lighting. We will inform people through lectures in schools and public places. Also, local radio and printed media will be used to spread our message.

COMMUNITY

Next to the Pedal Place being a meeting point for locals, the lighting makes sure the villagers can have more social interaction at night. The Pedal Stools are manufactured in local workshops and decorated by artists, creating employment.



FRANCHISING

In the future, the concept will be spread to other slum settings through franchise. Local entrepreneurs can use our knowledge and resources to set up a new business in their slum by starting their own Pedal Place.

INCLUDING SOCIAL COHESION IN PRODUCT DESIGN CASE 1 - PEDAL POWER LED

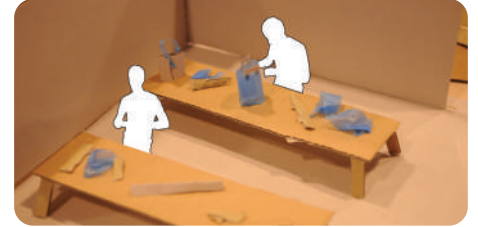
Jorn Duwel	1363425
Remco Kassels	1355376
Guido Knook	1355406
Serge Meier	1373927
Ester Persoon	1355643



A Social Garbage Collecting System



BARRELS



SOCIAL MECHANISM

Barrels is a system for collecting garbage. The cart can be pushed around to collect garbage. When in narrow streets, a single barrel can be put on someones back to reach every household and thus create a meeting point and increase face-to-face contact between villagers.

THE SYSTEM

Garbage is collected in teams, both door to door and from the dumpfield. Some collected material will be used for making bags that will be sold in the Netherlands. Other bio-degradable materials will be used to produce and sell compost.

VALUE

The big advantage of our system is garbage getting value. People will get paid for handing in their trash or because they can get employed by Barrels to collect the garbage or to make the bags.



UPSCALING

In the future, the system will be expanded to other slum settings. Garbage will be collected and transported to our central bag workshop. The carts and barrels are rented out for a fixed amount per month to local entrepreneurs.

INCLUDING SOCIAL COHESION IN PRODUCT DESIGN

CASE 2 - GARBAGE COLLECTING DEVICE

Jorn Duwel	1363425
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Ester Persoon	1355643

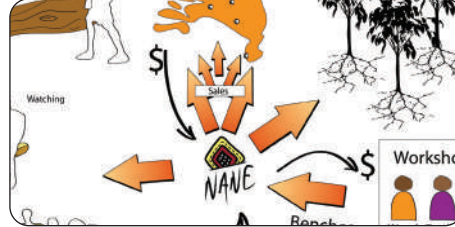


Mobile furniture for slum events



SOCIAL MECHANISM

Bukawa Bench is a product that connects the community to the product and functions as a place where people can meet. The bench, placed in the community for free, has holes in it, where modular add-ons, like back rests or game boards, can be put. The same Bukawa Bench will be sold at the Bijenkorf in The Netherlands.



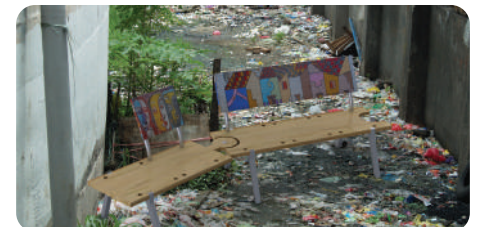
THE SYSTEM

Community members are employed to produce the 'Bukawa Bench' system and for every sold bench in The Netherlands, the community is granted with the same product for free to encourage social capital.



VALUE

We create value through selling the Bukawa Bench to the Netherlands and thereby creating a cashflow from the western country to our slum. Through organising events and workshops, people are encouraged to create add-ons for themselves and each other.



UPSCALING

The upscaling will be done by creating an other unique product for an other slum. The system will stay the same because it works. This way we create a certain brandimage which will eventually create certain feeling that every community in every slum is connected.

INCLUDING SOCIAL COHESION IN PRODUCT DESIGN CASE 3 - MOBILE FURNITURE

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