

CONCLUSION

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There exists a growing migration from the rural environment to the urban context in search of economical empowerment and opportunities. The city street is the host of economical and social activities; a street needs to be a pleasant and integrated place to live and create.

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The industrial production place is an archetype of creating new possibilities and opportunities. It is the laboratory that explores the process to generate. The current industrial production facilities hold the opportunity to integrate into the urban fabric; and not function as an isolated object that only focus on the product.

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It is essential that the industrial production facility function as an ecosystem that will establish connections to the local urban context. These emerging connections will yield integration between live and create.

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The Bio-diesel plant is therefore an expression of the production process that functions as an industrial ecosystem. It showcases and facilitates the integration of the production process into the urban fabric to contribute to the well-being and character of the area.

A building profile follows as summary:

Building Profile

ID: Pretoria West Bio-diesel Plant

Location: Buitenkant Street, Pretoria West Industrial Area, City of Tshwane,

Client: Private investors

Users: Workforce, local community buying bio-diesel with a small convenience shop, Informal traders using the market space at the ash-bunkers and consumer buying goods at the informal market.

Purpose:

To advance the principles of sustainable living through production (industrial process) and urban integration. The emphasis is on the process of production and not the product, in order to change the mindset of a linear production process to a cyclical process.

Aim:

To illustrate the production process of the bio-diesel incorporating low-energy architecture, energy production and sustainable community integration.

Building systems:

- The workforce (people) is the most important energy resource of the bio-diesel plant and the use of passive design strategies will give form and spatial quality to the building (natural ventilation, daylight and fresh air flowing into the building).

- Minimising the energy required for heating and cooling of the building. In the production process discarded used cooking oil is washed with water, the cool air that is a by-product of this process will be used to cool down the building. Heat, on the other hand, is generated in the production process; in summer the heat is allowed to dissipate out of the louvers and in winter the heat will be redirected and used in the office, boardroom, laboratory and training room.
- The timber pergola structure with vines will provide shade and block direct sunlight from entering in summer and heating up the space. In winter the vines lose their leaves and will allow sunlight to enter into the interior space, passively warming the building.
- Night-flushing is implemented through the louvers. Typically the night air is blown through for around an hour or two just before sunrise.
- The roofs of the building will be used to harvest rainwater and be stored in tanks that are elevated three meters high in the air, to make use of gravity. The rainwater will be used to wash the discarded used cooking oil; this process will double up as a cooling strategy for the building. Rainwater will also be used in the showers and grey-water will be used in the w/c.

Building material:

To gain consistency throughout the project and minimal material weight material is assigned to the functions of the building.

Steel:

Steel is used as the primary load bearing structure and in the secondary structure as façade cladding. Steel is associated with the functions of the production process.

Timber:

Timber will be used to differentiate the social areas from the industrial areas, and to relate the human-related scale to that of the industrial scale. Timber is associated with the functions of the social process.

Masonry:

The two service areas at the back of the bio-diesel plant will consist of masonry to relate to the adjacent masonry power station building.

Energy systems:

Solar energy:

The bio-diesel plant will remain in the shade for most of the afternoon, due to the scale of the adjacent building. A part of the roof of the bio-diesel plant is at an angle of 27° to accommodate photovoltaic panels and a solar heating system to provide enough electricity for the lighting and heating of the showers and basins. This roof pitch will allow ample daylight and airflow into the building.

Wind energy:

The Pretoria West Industrial Area is not conducive to high wind generation, therefore the building is designed to accommodate airflow to assist in the natural ventilation of the building.

Bio-fuels:

A proportion of the produced can be used to power some of the machinery, for example the generator.

Affluent from the water closets (w/c) will be pumped to the proposed urban agricultural centre on the site of the Pretoria Power Station, here it will be used in the production bio-gas.

is to introduce a mixed-use development to complement the existing uses and establish a development destination. The site's unique features (landmark qualities), its close proximity to the City of Tshwane CBD and strategic connections present an opportunity to establish it as a hub for retail, commercial, light industry, transport node and recreational activities. This would serve as a drawing-card for business activities and aid in densifying the area.

Building as an ecosystem:

The proposed Pretoria West Bio-diesel Plant will function as part of the industrial ecosystem. Waste from another process (discarded cooking oil) is used to produce an energy resource (bio-diesel). Similar waste (glycerol) from the bio-diesel production process will be used in the manufacturing of soap. Other by-products such as heat (production process) and cool air (from washing the discarded cooking oil) will be used in the heating and cooling strategies of the building.

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Addendum A

The aim of the local news paper analysis is to determine the hierarchy of themes that currently prevail in this area. The method the author applied was to quantify the information. For example: different themes were identified (crime, relocation of people, education, poverty etc.), and a point is assigned to a theme so each time it is published it obtains a higher value. Pictures published with articles were also taken into consideration and their value quantified. The last consideration was the amount of articles on the front page with three or more equalling zero, two articles equalling one point and one article, two points). The aim was to identify various themes and to assign a numerical value to each in order to determine their representative social value of importance.

On page two of the newspaper is the 'let's clean up' campaign, whereby awareness of different recycling programs, initiatives to clean up suburbs, reporting on illegal dumping sites, water-saving strategies and taking ownership of your area are covered. These themes were identified and numerical values were assigned to each. Advertising was also analysed according to different products and services and quantified by looking at the amount of advertisements placed related to a specific product or

service.

The newspaper is community focused with a strong emphasis on local news. The author divided the newspaper into four parts: the front page, page two with the "let's clean up" campaign, page three to five of the newspaper, and the advertisements. These four parts were used to determine the themes prevailing in the community and then quantified as previously described.

When the author started identifying the themes it became evident that the challenges faced by this community are not isolated but intensely integrated, where one influence the other. From the front page (fig: 111) and page three to five, the removal of illegal squatters and crime scored the highest (18.3%). Lack of service delivery by the City of Tshwane Metropolitan Municipality scored third-highest with 15.8%. Other themes such as education (12.1%), illegal dumping (8.5%), poverty (6%) and public transport (6%) were also identified. A network of context was established enabling the author to relate meaning to the themes and identify opportunities for emergence.

For example the removal of illegal squatters is a major problem in this community, indicative of a high level of poverty with people not being able to afford their own homes, most likely unemployed, so their basic need for shelter and food aren't provided for. This implies a lack of stability keeping the community from developing and evolving.

Crime was also identified as a major challenge and there are various reasons why people participate in crime. This kind of action breaks down any sense of community and spreads a sense of fear amongst people. The third theme in the analysis was the poor services that are provided by the City of Tshwane Metropolitan Municipality (illegal dumping is a result of this). The novelty that architecture can become self-sufficient and not rely on external energies to maintain itself, is a model where waste equals food (Capra, 2002: 234), and must be investigated. Education in this area is marked by instability; almost every newspaper had an article regarding students being unsatisfied with the management of their colleges: "We will vandalise and destroy campuses to send out a strong message. We will not stop until the minister of Higher Education comes here" said the chairperson of the Student Representative Council on the March 12th 2010 in the Pretoria West Record. This sort of educational environment will not generate any creative thinking or skill.

The last theme that was identified is the unreliability of the public transport:

Between 2008 and 2010 I lost about R3750 because buses never pitched and I had to pay for alternative transport. My employer has deducted money from my salary for being late. At times I have had to apply for unpaid leave at work because the bus drivers were on strike. My job is on the line as a result of this', said Bonny Bennet (54) in the Record of March 26, 2010.

The second analysis focused on the 'let's clean up' campaign (fig: 112) that received a great deal of attention, judging by the bright heading on the front page: 'clean up ... let's clean up ... let's clean'. The entire page two is dedicated to articles relating to this topic. The initiatives implemented through recycling programs are mostly focused on schools, and combined with education to establish a way of thinking. In an article published on January 22, 2010, schools had to collect bottles and cans in order for them to win FIFA soccer world cup soccer tickets. Jack Mwale, a pupil from Stanza Bopape High School made the following statement:

Before this competition we did not know about recycling. When we were collecting the bottles and cans in the neighbourhood, people laughed at first but we told them that these bottles and cans can be used again and should not litter our streets. We said by collecting used items we would win tickets to see the World Cup.

The children probably only participated because they could win tickets to the World Cup, but the important argument here is one that BIG Architects (2010:51) also makes in their book, Yes is More: ecological initiatives will only prosper in the real world if they work as viable economic models, and to these children a World Cup ticket was a very important and viable economic model. Ownership is also advocated to get residences involved in cleaning up their own suburbs. These community initiatives are published in the newspaper as a call-to-action invitation and to report on the good work done. Another identified challenge is illegal dumping sites due to a lack of service delivery from the City of Tshwane Metropolitan Municipality. This sort of activity can do a lot of harm to the identity of the community. On the February, 26, 2010 an article was published on the spot program, a door-to-door campaign that will spreading the message to stop dumping, and to develop a team to deal with problems of service delivery. The author is of opinion that this is just a strategy to philosophise about service-delivery; in non of the newspapers are there any reports on practical strategies to solve this problem.

The last analysis was focused on advertising (fig: 113) and confirm that this is predominantly car related industry focus of the area with 25,6% of the advertisements being car related.

The aim of this analysis (fig: 114) was to discover the emerging opportunities that the architecture could respond to. Hamdi (2004) and Capra (2002) argue that emergence is born out of instability and challenges; which generates opportunities for development, learning and evolution. The themes identified in this analysis will be further analysed according to the inherent emerging opportunities that they present, to ultimately become informative to the architecture. Hamdi describes it as small beginnings:

This philosophy of acting in order to induce others to act, of offering impulse rather than instructions, and of cultivating an environment for change within, starts at the ground and often with small beginnings which have emergent potential (Hamdi, 2004: xx)

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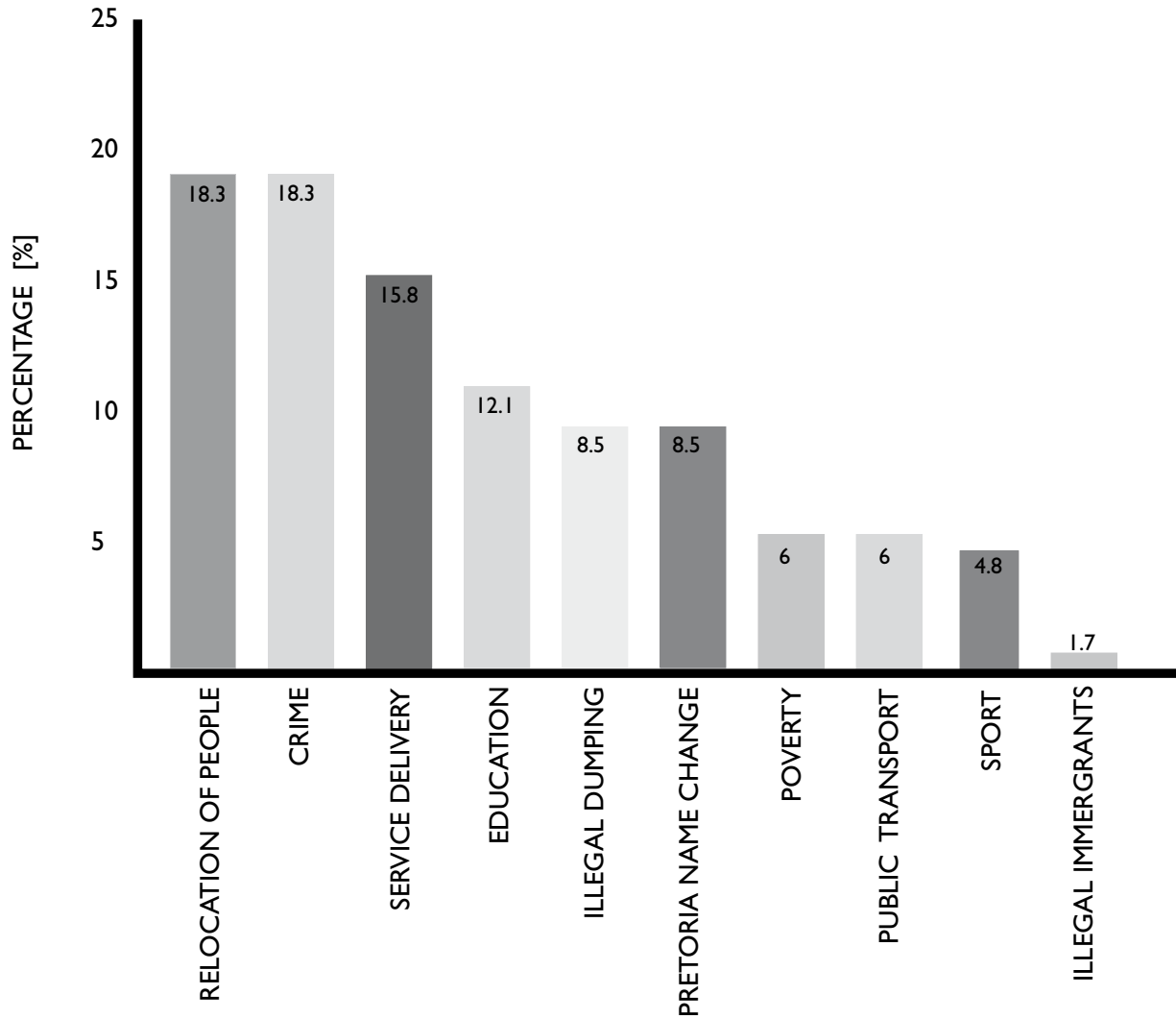
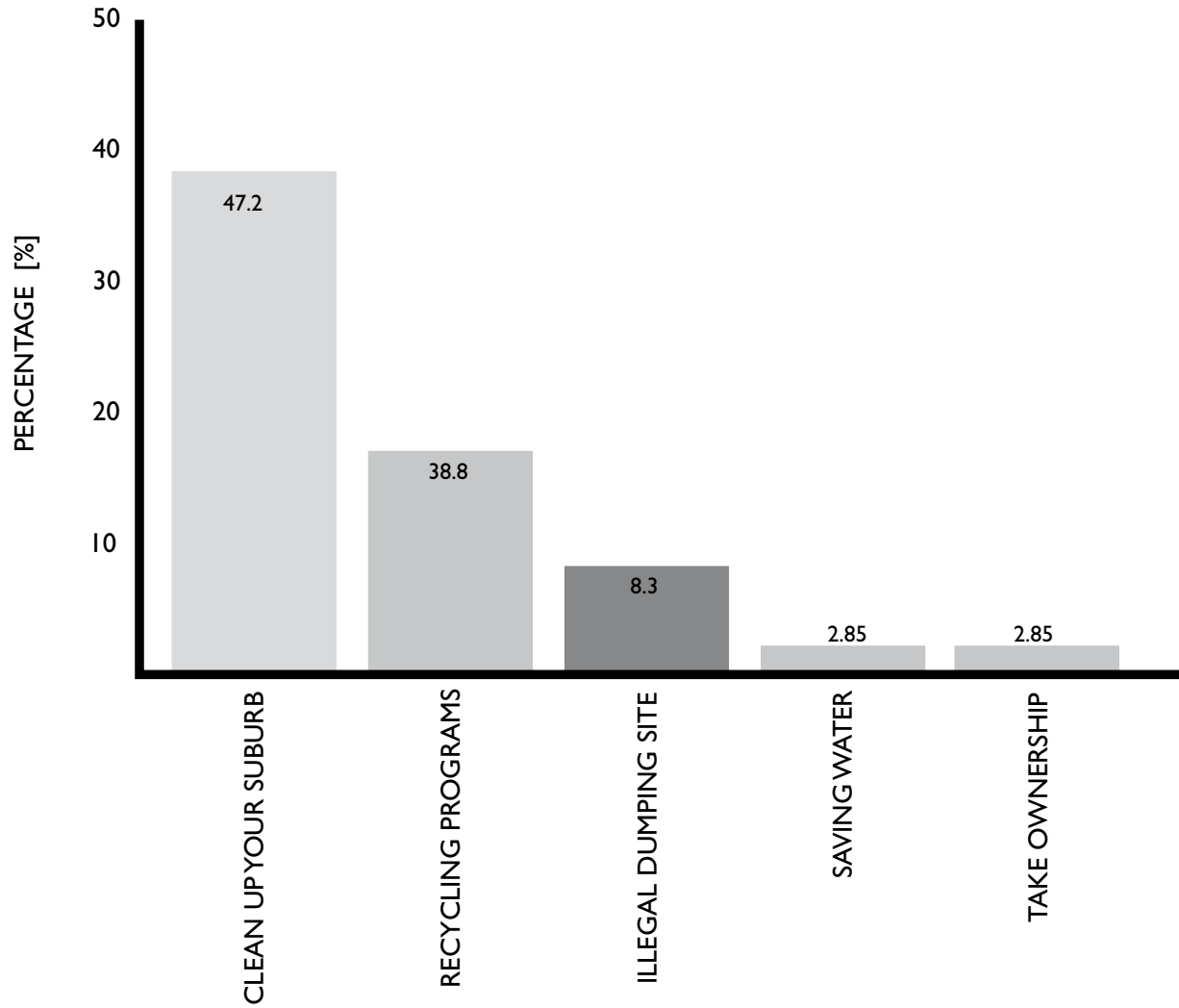


Figure 98. Themes from the front pages and community news section: Author 2010.



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Figure 99. Themes from 'let's clean up' section: Author 2010

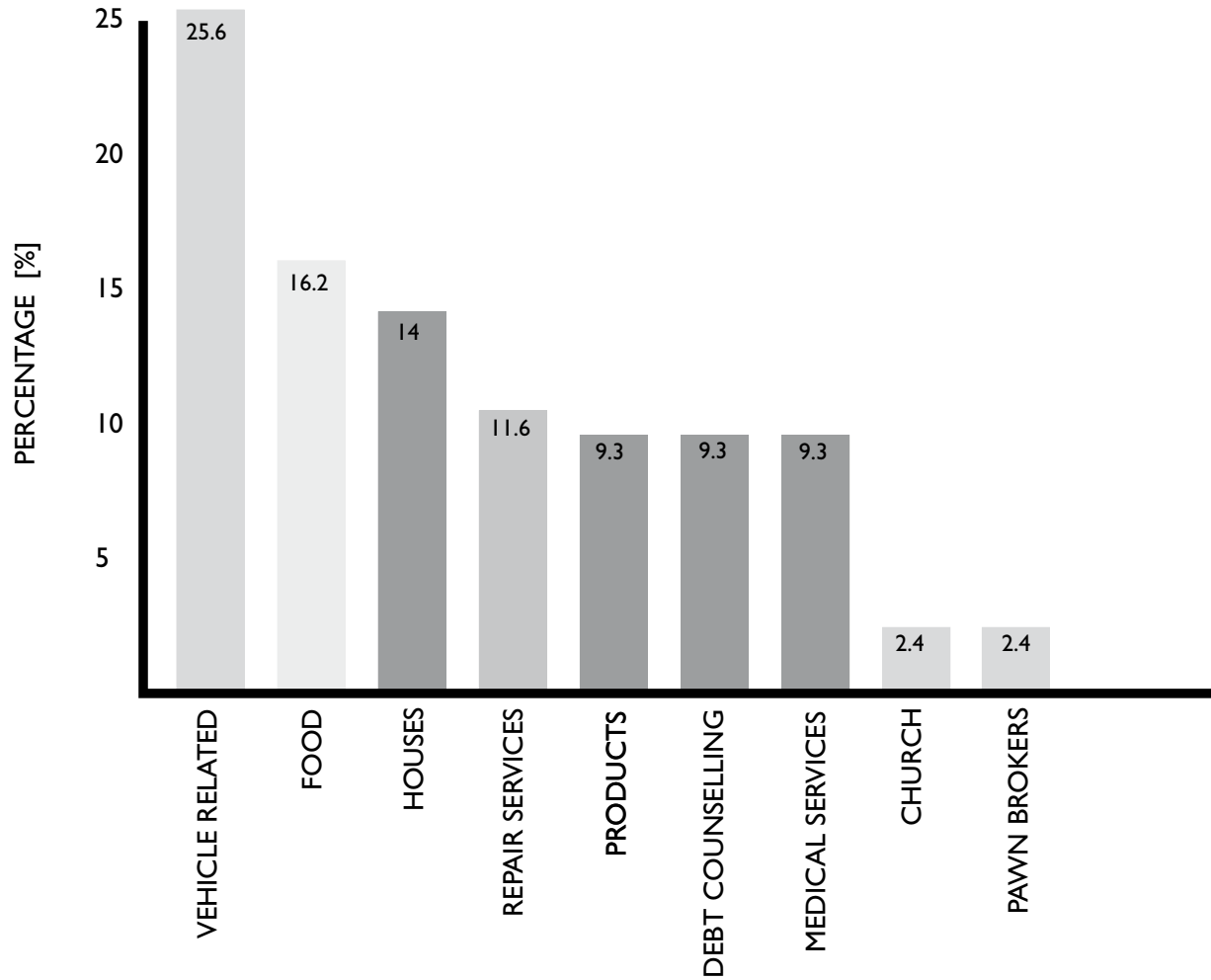


Figure 100. Themes from the advertisement: Author 2010.

THEMES		QUALITATIVE [emergence]	QUANTITATIVE [industrial architecture]
-RELOCATION OF PEOPLE		-IDENTITY AND COMMUNITY economics /work	-HOUSING + JOB CREATION
-CRIME	PROVISION	-SELF RESPECT economics and community	-MANUFACTURING AND CREATING job creation
-SERVICE DELIVERY	DEPENDENCE	-SELF SUSTAINED government, economics -taxes	-PASSIVE DESIGN economics + job creation
-EDUCATION	EMPOWERMENT	-ENTREPRENEUR social change, economics	-TRAINING FACILITY/BUSINESS job creation and empowerment
-ILLEGAL DUMPING		-SELF REGENERATIVE community/ ownership/ education	-RECYCLING PLANT community/ education
-POVERTY		-DIGNITY awareness/ economics / education / identity/	-CREATIVE SKILLS TRAINING education
-PUBLIC TRANSPORT	DEPENDENCE	-STABILITY services, government, economics	-TRAIN AND BUS STATION services: economics / dependency: job creation
-SPORT		-CHARACTER, ENDURANCE health, entertainment, recreation	-SPORT FACILITY health/ recreation
-ILLEGAL IMMIGRANTS	LOCAL IDENTITY	-DIVERSITY community, identity, economics	-TRANSFER OF SKILL local identity/ community/ job creation
-RECYCLING PROGRAMS		-WASTE EQUALS FOOD education , economics , job creation	-RESEARCH + EXPERIMENT - REGENERATIVE PRODUCTION job creation
-CLEAN YOUR SUBURB		-OWNERSHIP, RESPECT identity/ education / community	-GREEN SPACE/RECREATIONAL SPACE communal social space
-SAVE WATER		-RESPECT AND VALUE economics / education	-WATER RECYCLING PLANT education + job creation

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Figure 101. Emerging themes that came out of the newspaper study: Author 2010.

Addendum B

TYPES OF FORMAL FOOD PREMISES	TOTAL NUMBER
1. Bakeries	450
2. Butcheries	599
3. Cafes	1 147
4. Canteens	53
5. Dairies	54
6. Deli	54
7. Food manufacturer	150
8. General dealer(food)	1 500
9. General dealer(other)	98
10. Resturant	1 631

Total number of food premise: 6552

INFORMAL FOOD PREMISES

1. hawkers	109
2. informal food	196
3. mobile vehicle	8
4. occasional food handling premise	15

(Mathalanto, 2010)

Danie Derick Konrad
Labot Johan Andrew Jan
Dad Ma Ella Marlise
Gerhard **Dankie** Ida Nadia Tracey
Neda Ilse Ardi Izaan
Werner P6 Marlet Johan Henry
Arthur Johan Salma
Talita
[Dankie vir jul passie]

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Model photo's



