

Elsenburg

Joernaal Journal

Die invloed van die teenwoordigheid van 'n broeipaar op die gedrag en oorlewing van dagoud volstruiskuikens (*Struthio Camelus*)

bladsy 2

deur M Janse van Vuuren^{1, 2}, T S Brand^{1, 2} en S Engelbrecht³

¹ Elsenburg Instituut vir Diereproduksie, Elsenburg, Departement van Landbou: Wes-Kaap, Privaatsak X1, Elsenburg 7607

² Nelson Mandela Metropolitaanse Universiteit (Saasveld Kampus), George, 6530

³ Instituut vir Diereproduksie: Oudtshoorn, Oudtshoorn, 6120

Rural Development: where to go?

page 6

by E Jacobs, R J Nowers & D P Troskie

Agricultural employment statistics

page 10

by Elné Jacobs

Die invloed van die teenwoordigheid van 'n broeipaar op die gedrag en oorlewing van dagoud volstruiskuikens (*Struthio Camelus*)



deur M Janse van Vuuren^{1, 2}, T S Brand^{1, 2} en S Engelbrecht³

¹ Elsenburg Instituut vir Dierreproduksie, Departement van Landbou: Wes-Kaap, Privaatsak X1, Elsenburg 7607

² Nelson Mandela Metropolitaanse Universiteit (Saasveld Kampus), George, 6530

³ Instituut vir Dierreproduksie: Oudtshoorn, Oudtshoorn, 6120

Die invloed wat die teenwoordigheid van 'n volwasse broeipaar op die gedrag en oorlewing van volstruiskuikens het, is ondersoek. Dagoud kuikens ($n=180$) is ewekansig in 8 groepe ingedeel. Vier van die groepe is saam met 'n volwasse volstruisbroeipaar elk, in lusernkampies grootgemaak. Die ander 4 groepe is sonder broeipare grootgemaak. Die proef is vanaf dagoud tot op 10 weke ouderdom uitgevoer. Mortaliteit is vir die 10 weke periode aangeteken. Nadoodse ondersoek is uitgevoer en oorsake van mortaliteit is aangeteken. Gedragstudies is daagliks vir die eerste week van elke behandeling uitgevoer. Data is statisties deur meervoudige analise van variansie ontleed. Oorlewing (81.5 vs $49.6 \pm 3.2\%$) was hoër ($P \leq 0.01$) vir kuikens in die groepe wat saam met 'n broeipaar grootgemaak is. Gedragstudiedata het geen betekenisvolle verskille tussen behandelings vir die verskillende gedragsaktiwiteite getoon nie. Die volgende aktiwiteite as persentasie kuikens per groep naamlik: stap (26.7 vs $24.6 \pm 1.8\%$), vreet (0.1 vs $0.9 \pm 0.3\%$) drink (0.9 vs $0.3 \pm 0.3\%$), pik na ander (8.0 vs $5.3 \pm 1.1\%$) en pik na mekaar (0.0 vs $0.1 \pm 0.1\%$) vir onderskeidelik kuikens wat saam met 'n broeipaar grootgemaak is, teenoor kuikens wat in afwesigheid van broeipare grootgemaak is, is aangeteken. Vir kuikens wat deur 'n broeipaar grootgemaak is, was die persentasie kuikens wat na lusern gepik (28.6 vs $9.3 \pm 1.6\%$) en die wat hulself met hul snawels glad stryk (1.0 vs $0.1 \pm 0.3\%$), hoër ($P \leq 0.05$) as by kuikens wat in afwesigheid van 'n broeipaar grootgemaak is. Vir kuikens wat in die afwesigheid van 'n broeipaar grootgemaak is, was die persentasie kuikens wat gesit (56.3 vs $33.1 \pm 2.9\%$) en na grond gepik het (3.1 vs $1.6 \pm 0.5\%$) betekenisvol hoër ($P \leq 0.05$) as by kuikens wat in die teenwoordigheid van 'n broeipaar grootgemaak is.

INLEIDING

Die grootmaak van kuikens geskied in die meeste gevalle onder kunsmatige sisteme waar die mens die rol van die volwasse volstruis vervang (Deeming & Ayres, 1994). Die tekort aan teenwoordigheid en leiding van ouers is een van die oorsake van spanning by die volstruiskuikens wat onder kunsmatige toestande grootgemaak word, wat weer tot spanningverwante gedrag soos swak voeding lei (Cooper, 2001).

Volgens Ganzevoort (2001) lê die geheim van suksesvolle grootmaak van volstruiskuikens by voedingsbestuur van die kuiken en veral vaslegging ('inprenting') van vreetgedrag. Verskeie produsente gebruik stelsels waar volstruiskuikens deur volwasse broeipare op weidings grootgemaak word (Deeming et al., 1994; Nel, 2006). Soos kuikens oud genoeg is om na voerkrale verskuif te word, word hulle weer vervang deur nuwe kuikens (Cooper, 1996 soos aangehaal deur Cooper, 2001; Deeming & Ayres, 1994). Hierdie praktyk is gebaseer op die natuurlike gedrag van volstruise. Onder natuurlike toestande bly volwasse volstruise en hul kuikens saam as familie vir ten minste 10 maande totdat die jong voëls gereed is om vir hulself te sorg (Davies, 1993). In die natuur leer die volstruiskuikens hoe om te eet deur hul ouers se voedingsgedrag na te boots. Die kuikens vorm groepe of 'creches' wat dan deur 'n paar volwasse voëls, wat nie noodwendig verwant aan die kuikens is nie, opgepas word. (Bertram, 1992; Deeming et al., 1996). Volwasse broeivoëls met broei-ondervinding maar met defekte soos krom bene of nek, of wat swak produseer of onvrugbare eiers lê kan saam met kuikens geplaas word en so die kuikens leer vreet en kalmeer (De Kock, 1996).

In bestuursisteme vir ander loopvoëls, onder meer die rheas (*Thea Americana* en *Pterocnemia pennata*) word volwasse rheas met sukses gebruik om hul eie en kunsmatig uitgebroeide kuikens groot te maak. Die kuikens bly verskeie maande by die volwasse mannetjie wat hul na voedsel lei, van hitte voorsien en beskerm teen ongediertes (Navarro & Martella, 2002; Reissig & Robel, 2001).

In hierdie studie word die invloed van die teenwoordigheid van broeivoëls op die gedrag en oorlewing van volstruiskuikens ondersoek en vergelyk.

MATERIAAL EN METODES

Behuising en voeding

Die proef is op die Oudtshoorn uitgevoer. Die Oudtshoorn val binne die sukkulente Klein Karoo met het 'n winterreënval van gemiddeld 250 mm per jaar (Theron, 2008). Die proef is gedurende die volstruise se natuurlike broeiseisoen uitgevoer, wat van vroegsomer tot begin herfs strek. Die

volwasse volstruisbroeipaar en kuikens is in lusernkampies van 20x50m aangehou terwyl kontrole groepe in kleiner kampies van 10x20m aangehou is. Skadunet is in die vorm van skadunet-afskorting voorsien. Voer (in die vorm van 'n vooraanvangsdiëet) en vars water is daaglik aan beide groepe voorsien. Die groep sonder broeipare is vir die eerste 6 weke saans binne in kartonringe (in 'n onderdak bestaande uit stroobale) geplaas, terwyl die groep by die broeipare buitekant gebly het.

Ekperimentele prosedures

Volstruiskuikens (n=20) is by elk van 4 broeipare geplaas. Vir elke broeipaargroep is ewe veel kuikens uit dieselfde groep in 'n kontrolegroep gedeel wat sonder 'n broeipaar grootgemaak is. Die broeipare met kuikens, sowel as kuikens sonder broeipare, is onder presies dieselfde omgewingstoestande grootgemaak. Gedragstudies is 7 keer per dag, vir die eerste 5 dae vandat die kuikens by die broeipare geplaas is uitgevoer. Tydens gedragstudies is waarnemings elke twee uur, vanaf 06:00 tot 18:00 gemaak. Mortaliteit is daaglik aangeteken en per groep oor die proeftydperk van 10 weke bepaal. Nadoodse ondersoek is gedoen en oorsaak van vrektes is aangeteken.

Statistiese ontleding

Gedrag- en oorlewings-data is met analise van variansie ontleed (*Statgraphics, 1991*). Alle statistiese prosedures gebruik is beskryf deur *Snedecor en Cochran (1980)*.

Resultate en Bespreking

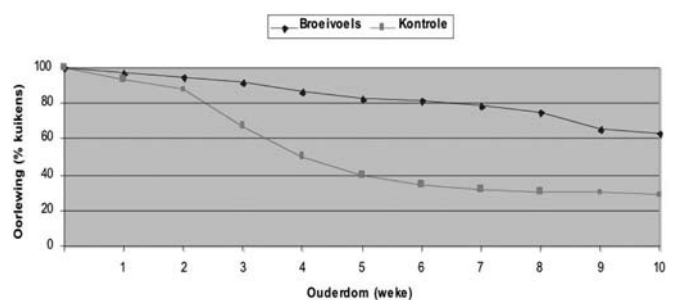
Die teenwoordigheid van 'n broeipaar by die kuikens het die oorlewing van volstruiskuikens bykans verdubbel ($P < 0.01$) in vergelyke met kuikens wat sonder broeipare grootgemaak is (**Tabel 1, Figuur 1**).

Tabel 1: Die invloed van teenwoordigheid van broeipaar op oorlewing (%) van volstruiskuikens vanaf dagoud tot 10 weke ouderdom.

	Oorlewing (% kuikens)
Broeipaar-kuikens	81.5 ^a ± 3.2
Kontrole-kuikens	49.6 ^b ± 3.2

^{a,b} Dui betekenisvolle ($P \leq 0.01$) verskille in kolomme aan.

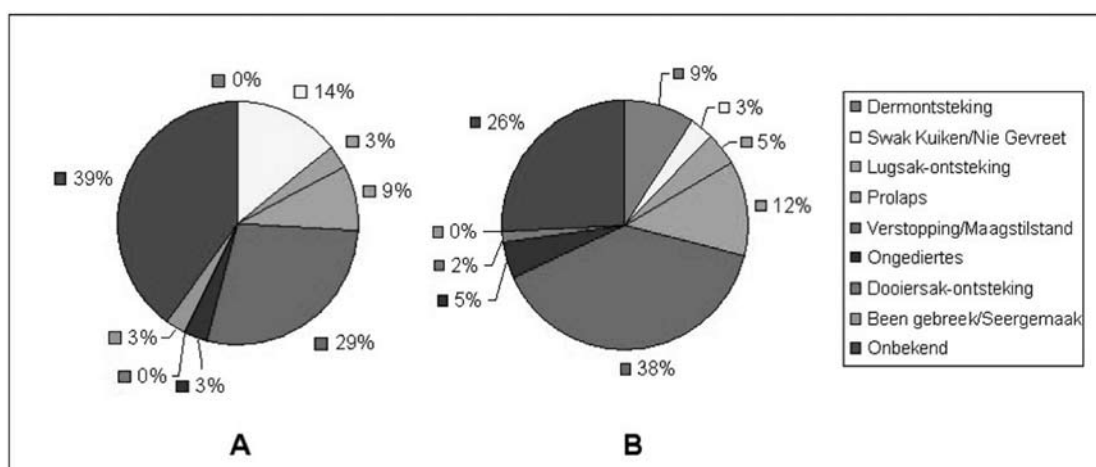
Die resultate stem ooreen met literatuur wat aandui dat kuikens nie so suksesvol onder kunsmatige grootmaaktoestande en deur mense grootgemaak kan word as deur volstruis pleegouers of broeipare nie (*De Kock, 1996; Engelbrecht, 2006*).



Figuur 1: Die invloed van teenwoordigheid van broeipaar op oorlewing (%) van volstruiskuikens vanaf dagoud tot 10 weke ouderdom

Die oorsake van mortaliteit vir kuikens word in **Figuur 2** aangedui. Alhoewel verstopping van die spysverteringskanaal (SVK) vir beide behandelings die hooforsaak van vrektes was, was die persentasie vrektes weens verstopping vir kuikens wat in afwesigheid van broeivoëls grootgemaak is, tot 25% hoër as teenoor kuikens

na volgende bladsy



Figuur 2: Oorsake van vrektes (%) by volstruiskuikens wat saam met volwasse broeipare (A) grootgemaak is, teenoor volstruiskuikens wat kunsmatig sonder broeipare (B) vanaf dagoud tot 10 weke ouderdom grootgemaak is.

van vorige bladsy

wat saam met 'n broeipaar grootgemaak is. Dit stem ooreen met literatuur wat aandui dat verstopping een van die hooforsake is wat tot die hoë mortaliteit by volstruiskuike (Mushi et al 1998; Terzich & Vanhooser, 1993; Sato et al. 1994; Hastings, 1991) en ander loopvoëls (Reissig & Robles, 2001) bydra. Ander oorsake van mortaliteit was: dermontsteking, swak kuike, lugsakontsteking, prolaps, dooiersakontsteking, beserings en ongediertes.

Gedragstudiedata word in **Tabel 2** weergegee. Daar was geen verskille ($P > 0.05$) tussen stapgedrag, vreetgedrag, drinkgedrag, pik na voorwerpe- en pik na mekaar-gedrag van kuike wat in teenwoordigheid of afwesigheid van 'n volwasse broeipaar grootgemaak is nie. Kuike wat in die teenwoordigheid van 'n broeipaar grootgemaak is, het meer na lusern gepik en mekaar meer ge'pree'. Hierdie gedrag van volstruiskuike wat saam met broeipare grootgemaak is, kan verklaar word deur die 'inprenting' by die gedrag van die volwasse volstruise op die kuike (Lambrechts et al., 1998). Kuike wat sonder 'n broeipaar grootgemaak is, het meer gesit en na grond gepik. Die groter persentasie kuike wat na grond pik in die kontrolegroepe kan moontlik die groter hoeveelheid sterftes as gevolg van verstopping van die SVK in hierdie groepe verklaar, aangesien vreet van grond een van die hooforsake van verstopping is (Mushi et al. 1998).

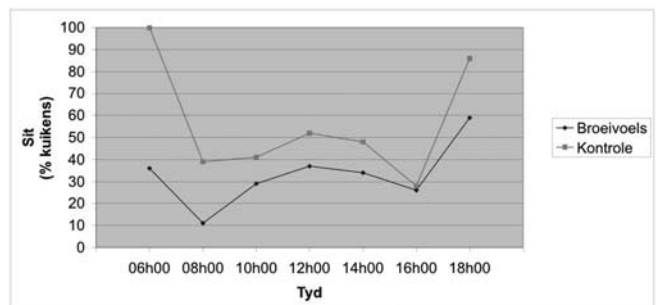
Tabel 2 Die invloed van teenwoordigheid van 'n volwasse broeipaar op die gedrag van volstruiskuike (% kuike per gedragsaktiwiteit).

	Broeivoëls	Kontrole
Sit	33.1 ^a ± 2.9	56.3 ^b ± 2.9
Stap	26.7 ^{NBV} ± 1.8	24.6 ^{NBV} ± 1.8
Vreet	0.1 ^{NBV} ± 0.3	0.9 ^{NBV} ± 0.3
Drink	0.9 ^{NBV} ± 0.3	0.3 ^{NBV} ± 0.3
Pree (Stryk vere)	1.0 ^a ± 0.3	0.1 ^b ± 0.3
Pik grond	1.6 ^a ± 0.5	3.1 ^b ± 0.5
Pik lusern	28.6 ^a ± 1.6	9.3 ^b ± 1.6
Pik ander	8.0 ^{NBV} ± 1.1	5.3 ^{NBV} ± 1.1
Pik mekaar	0.0 ^{NBV} ± 0.1	0.1 ^{NBV} ± 0.1

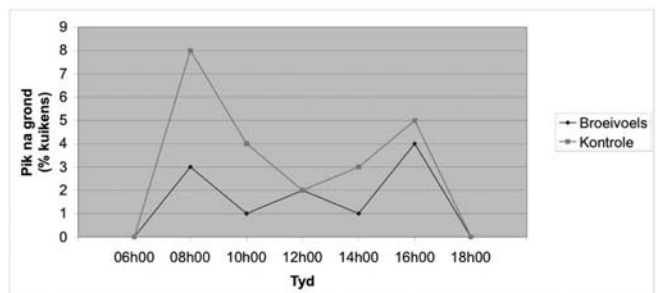
^{a,b} Dui betekenisvolle ($P \leq 0.01$) verskille in rye aan. NBV = Nie betekenisvol.

Verstopping van die SVK word baie keer veroorsaak deur spanning en afwykende voedingsgedrag (Smith, 1993). Sulke abnormale voedingsgedrag kom selde voor in sisteme waar volwasse broeipare of peetouers aangewend word, aangesien ouers die kuike leer om nie stokkies, grond ens. te vreet nie (de Kock, 1996; Engelbrecht, 2006). Volgens de Kock (1996) het kuike minder spanning en word abnormale gedragprobleme byna heeltemal voorkom wanneer volstruiskuike saam met peetouers grootgemaak word. 'n Bydraende faktor tot die hoë persentasie vrektes

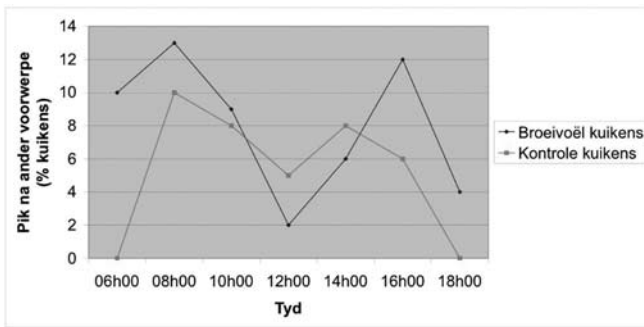
tydens hierdie studie was moontlik as gevolg van swak laergraad kuike wat gebruik is. Kuike wat reeds vanaf uitbroei, en vermoedelik vanuit die broeimasjiene, 'n agterstand gehad het, het van die begin af sleg gevreet. Die kwaliteit van kuike beïnvloed alle kuikengrootmaak fasiliteite (Engelbrecht, 2006). Volgens Brand (2006) het baie van die gebreke en abnormaliteite by volstruiskuike hul oorsprong in die broeikas. Aangesien die kwaliteit van eiers en uitbroei-omgewing die voorkoms en gesondheid van volstruiskuike beïnvloed (Deeming et al. 1996), is dit belangrik dat die kuikengrootmaker by die aankoop en uitkies van dagoud kuike, die kuike goed ondersoek om te verseker dat dit topgraad kuike is. Ander oorsake van mortaliteit in hierdie proef sluit in: prolapse, lugsakontsteking, dermontsteking, dooiersakontsteking, beserings en ongediertes. Die tyd van dag het kuike se gedrag beïnvloed met die minste aktiwiteit gedurende die middel van die dag. Dit kan aan natuurlike gedrag van diere toegeskryf word om min aktiwiteit te hê tydens hoër temperature. Tyd van dag het 'n duidelike invloed ($P < 0.05$) op die gedrag van volstruiskuike gehad, naamlik: sit (Figuur 3); pik na grond (Figuur 4), pik na ander voorwerpe (Figuur 5) en pik na lusern (Figuur 6). Volstruiskuike in beide behandelings was vanaf 06:00 aktief. Teen 12:00 het kuike meer gesit en was minder aktief gedurende die warmer tye van die dag. Teen 18:00 saans het kuike weer minder aktief geraak. Die rede hoekom die kuike van die kontrole groep op 06:00 en 18:00 gesit het, was aangesien hul teen 17:00 in onderdakskuiling gejaag is tot 7:00 soggens.



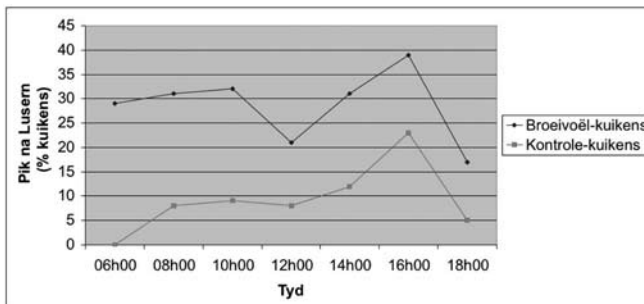
Figuur 3: Die invloed van tyd op die gedrag (sit) van volstruiskuike.



Figuur 4: Die invloed van tyd op die gedrag (pik na grond) van volstruiskuike.



Figuur 5: Die invloed van tyd op die gedrag (pik na ander voorwerpe) van volstruiskuikens.



Figuur 6: Die invloed van tyd op die gedrag (pik na lusern) van

GEVOLGTREKING

Die resultate wys dat die teenwoordigheid van volwasse broeivoëls by kuikens beter oorlewing tot gevolg het. Alhoewel die grootste oorsaak van sterftes in beide behandelings verstopping van die spysverteringskanaal was, was verstopping vir 'n groter persentasie kuikenvrektes (38%) by groepe wat sonder broeipare grootgemaak is, verantwoordelik. Dit blyk dat die teenwoordigheid van broeipare by kuikens in grootmaakstelsels groot voordele inhou vir die oorlewing van kuikens tot 10 weke ouderdom. Dit het waarskynlik te make met die kuikes wat beter vreetgewoontes en algemene gedragspatrone by die pleegouers aanleer. Wanneer groepe van 20 kuikens op lusernweiding grootgemaak word, mag die gebruik van pleegouers ekonomiese voordele inhou.

VERWYSINGS

Bertram, B.C.R. 1992. *The ostrich communal nesting system*. Princeton, New Jersey, Princeton University Press.

Brand, Z. 2006. *Natuurlike en kunsmatige broei van volstruiseiers*. In: Volstruishandleiding. Departement Landbou: Weskaap. Elsenburg & Suid-Afrika Volstruisbesigheidskamer. 18 – 30.

Cooper, R.G. 1996. *Ostrich Rearing – A possible investment opportunity in the United Kingdom and Europe. A report on the viability of ostrich breeding and the possible implications for investment*. Paper submitted to the Ostrich Producers Association of Zimbabwe (TOPAZ), Harare

Cooper, R.G. 2001. *Management of ostrich (Struthio camelus) chicks*. 6th European Symposium on Poultry Welfare. Zollikofen, Switzerland.

Davies, K. 1993. *Nowhere to Hide*. Poultry Press Fall/Winter 1993 (3) Nr.4.

Deeming, D.C. & Ayres, L. 1994. *Factors affecting the rate of growth of ostrich (Struthio camelus) chicks in captivity*. Veterinary Record 135: 617-622.

Deeming, D.C., Dick, A.C.K. & Ayres, L. 1996. *Rearing Ostrich Chicks – a Stockman's Guide*. Ratite Conference. Oxford, UK

De Kock, J.A. 1996. *Artificial rearing of Chickens*. In: Guidelines for successful ostrich farming. Little karoo Agricultural Development Centre. Oudtshoorn 18 – 23.

Engelbrecht, S. 2006. *Kunsmatige grootmaak van kuikens*. In: Volstruishandleiding. Departement Landbou: Weskaap. Elsenburg & Suid-Afrika Volstruisbesigheidskamer. 32 – 40.

Ganzevoort, B. 2001. *Basiese beginsels van kuikengrootmaak*. Inligtingsvergadering. Klein Karoo Koöperasie, Oudtshoorn.

Hastings, M.Y. 1991. *Ostrich Farming*. University of New England. N.S.W. Australia.

Lambrechts, H., Huchzermeyer, F.W. & Swart, D. 1998. *Integrating ostrich behaviour in commercial farming systems*. In: Proceedings of the 2nd International Ratite Congress. Oudtshoorn, South Africa, pp. 167-169.

Mushi, E.Z., Isa, J.F.W., Chabo, R.G., Binta, M.G., Modisa, L. & Kamau, J.M. 1998. *Impaction of the stomachs in farmed ostriches (Struthio camelus) in Botswana*. Avian Diseases. 42: 597 – 599.

Navarro, J.L. & Martella, M.B. 2002. *Reproductivity and raising of Greater Rhea (Rhea Americana) and Lesser Rhea (Pterocnemia pennata) – a review*. Arch. Geflugelk. 66 (3) 124 – 132.

Nel, K. 2006. *Volstruisboerderystelsels*. In: Volstruishandleiding. Departement Landbou: Weskaap en die Suid-Afrikaanse Volstruisbesigheidskamer. 6-10

Reissig, E.C. & Robles, C.A. 2001. *Gizzard impaction in lesser rhea chicks (Pterocnemia pennata) raised on farms in Patagonia, Argentina*. Avian Diseases. 45 (1): 240 – 244.

Sato, Y., Yasuda, J., Sinsungwe, H. & Sato, G. 1994. *An occurrence of stomach impaction in ostriches (Struthio camelus) on a farm in Zambia associated with high mortality*. Journal of Veterinary Medical Science. 56 (4): 783 – 784.

Smith, C.A. 1993. *Research Roundup: Ostrich chick survival presents challenge*. Journal of the American Veterinary Medical Association, 203 (5): 637-641.

Snedecor, G.W. & Cochran, W.G. 1980. *Statistical Methods (76th ed.)*. The Iowa State University Press, Ames, IA, 593 pp.

Statgraphics 5.0, 1991. *Statistical Graphic System*. Statistical Graphics Corporation Inc., Rockville, MD, pp. 015-033

Terzich, M. & Vanhooser, S. 1993. *Postmortem findings of ostriches submitted to the Oklahoma animal disease diagnostic laboratory*. Avian Diseases. 37 (4): 1136 – 1141.

Theron, S. 2008. *Persoonlike kommunikasie*. Beaufort-Wes Landbouvoorligting, Beaufort-Wes.

Rural Development: where to go?



by E. Jacobs, R. J. Nowers & D. P. Troskie

1. INTRODUCTION

In the new Cabinet of the Western Cape Province, the portfolio of the Minister of Agriculture has been enhanced to be the Minister of Agriculture and Rural Development. At a national level the National Department of Land Affairs is now the Department of Rural Development and Land Reform and the National Minister, Minister Nkwinti, has indicated that he wants to convey the responsibility for Rural Development to the Premiers of the various provinces.

It follows that it is clear that the importance of rural development has increased exponentially and programmes and practices need to be put in place to take it further. However, a major question that needs to be addressed is 'where to start with these interventions?'. It follows that the purpose of this paper will be to identify areas that may be potentially suitable for pilot projects. This will be done in accordance with the principles of 'the triple bottom line' or, in other words, Economic, Social and Natural considerations.

2. THE ECONOMIC FILTER

One of the first questions we need to ask ourselves is "what is rural?". Very few people will argue that the City of Cape Town can be classified as rural. The Cape Town Functional Region has been defined in the OECD (2008) report to include the City at its core, and on the periphery to include the area from the Saldanha Bay Municipality on the West Coast all the way south and south-west to the Overstrand Municipality on the south-coast of the Province.

As part of the debate in defining "rural" it is also important to consider the role of rural towns. It can be argued that the rural towns do have a very significant role to play as:

- a) A market for locally produced products;
- b) A service centre for the immediate area (this, however, is only viable if there is substantial economic activity in the area surrounding the town);
- c) much of the momentum for rural development actually comes from the interaction between the small town and its immediate hinterland.

It follows that the wellbeing of small towns is indelibly linked to the wellbeing of its immediate hinterland, but also *vice versa*. The implication is that, although the aim of rural

development may be to develop the area outside urban centres, this is not viable without taking the interrelationship between urban centres and its hinterland into account. In other words, rural development initiatives must focus on both town and hinterland development.

From an economic development perspective it can be argued that it makes sense to stimulate the economy in those areas with the greatest economic potential. This approach has been followed by *Van der Merwe et al* (2004) in their analysis of the growth potential of towns in the Western Cape. To this end they used between three and ten indicators per indicator category to calculate a Composite Development Index (see **Table 1**). This is used to classify the development potential of the 131 towns in the Western Cape.

Table 1: Summary of indicator groupings to calculate a Composite Development Index.

INDICATOR CATEGORY	COMPOSITE INDEX
Natural Resources	Composite Resource Potential Index
Human Resources	
Human Resources Change	
Transportation and Communications	Composite Infrastructure Index
Institutional Services	
Economic Sectors	Composite Economic Activities Index
Economic Sectoral Change	
Commercial Services	
Market Potential	
Regional Vitality	

Source: Van der Merwe et al (2004)

By using this approach they identified the following seven leader towns outside the Cape Town functional region:

- Beaufort-West
- George
- Knysna
- Mosselbay
- Oudtshoorn
- Swellendam
- Vredendal

It is important to note that the document by *Van der Merwe et al (2004)* was commissioned as part of the preparatory work for the Spatial Development Framework (*PSDF, 2009*) of the Western Cape. It follows that these same towns were identified as leader towns in the PSDF.

3. THE SOCIAL FILTER

As we argued that economic development is only one part of the development process and that the need to address human needs is a very important second cornerstone for sustainable development, it makes sense to use social needs as the second filter.

In Table 2 the data of the Community Survey of 2007 (*StatsSA, 2007*) was used to determine the certain proxies for human and social development needs. Furthermore, as the ranking (rather than the actual values of the various indicators) is of consequence for this analysis, the information in Table 2 only provide the rankings, with 1 being the worst off and 7 being the best off. This would mean that the percentage of households with access to piped water in their house would be lower in Knysna than in George.

Table 2: Ranking of household indicators (1 = worst-of; 7 = best-off).

Local Municipality	Piped water in house	Electric lights	Refuse remove	Flush toilet	Informal house	Subtotal
Matzikama	6	3	1	5	6	21
Swellendam	7	7	2	6	5	27
Mossel Bay	3	6	7	4	4	24
George	2	2	5	3	1	13
Oudtshoorn	4	4	3	2	3	16
Knysna	1	1	6	1	2	11
Beaufort West	5	5	4	7	7	28

Source: Calculated from StatsSA (2007)

In this table, piped water was used as an indicator for access to water; electric lights as a proxy for the availability of energy; refuse removal for services; flush toilet for sanitation; and informal housing as a proxy for housing. As the subtotal is the sum of the various rankings, the information in the final column would indicate that households in Knysna are the worst off of all households in the seven areas.

The same approach was followed in **Table 3**, but this time with indicators focussing on personal variables. According to this information, persons in Beaufort West were worst off in all instances with the exception of access to a refrigerator, where people in Knysna were the worst off.

Table 3: Ranking of personal indicators (1 = worst-of; 7 = best-off).

Local Municipality	Poverty rate	Unemployment rate	No schooling	Unskilled	Receiving grants	No cellphone	No refrigerator	Subtotal
Matzikama	5	4	2	7	3	3	5	29
Swellendam	6	7	3	6	4	5	7	38
Mossel Bay	3	3	7	4	7	7	6	37
George	4	5	5	2	5	6	2	29
Oudtshoorn	2	2	4	3	2	2	3	18
Knysna	7	6	6	5	6	4	1	35
Beaufort West	1	1	1	1	1	1	4	10

Source: Calculated from StatsSA (2007)

The subtotals in the previous two tables were combined in **Table 4**. According to this ranking the citizens of Oudtshoorn were the worst off, followed by Beaufort West, George, Knysna and then Matzikamma.

Table 4: Combining Household and Personal Indicators to determine the ranking of Local Municipalities.

Local Municipality	Subtotal		Total	Ranking
	Household Indicators	Personal Indicators		
Matzikama	21	29	50	5
Swellendam	27	38	65	7
Mossel Bay	24	37	61	6
George	13	29	42	3
Oudtshoorn	16	18	34	1
Knysna	11	35	46	4
Beaufort West	28	10	38	2

Source: Based on Table 2 and Table 3.

However, Oudtshoorn, George and Knysna are all part of Eden District Municipality. The result is that it will not be a good idea to have more than one pilot project in the area of the same District Municipality. For this reason Oudtshoorn, Beaufort West and Matzikamma were selected to proceed to the next level of analysis.

continued on next page

from previous page

4. THE AGRICULTURAL / NATURAL ENVIRONMENT FILTER

One further element needs to be introduced into the discussion at this stage. In the case of Matzikamma (Ebenhaezer) and Oudtshoorn (Dysselsdorp) there is in each Municipality one of the most important land restitution cases and disadvantaged communities in the Western Cape. It is evident that these communities will be the focal point of some of the most important elements of any rural development initiative that may follow in either of these two municipalities. Yet, the data on these communities are already captured in the data on the specific communities. In the case of Beaufort West no such community exists, but Murraysburg, right next door, faces similar challenges. For this reason the analysis from this point forward will include Murraysburg as part of the Beaufort West potential pilot project.

A summary of the main elements used is provided in **Table 5**. As was the case during the discussion of the previous tables, it is again important to note that the actual level of the various indicators is not important for the purpose of this submission. Of more importance is the ranking of the three Municipalities relative to one another.

In choosing the indicators it is also important to note that some of the economic indicators of relevance for the Agricultural Sector already received attention in determining the leader towns in the Province. Specific reference can be made to variables such as physical infrastructure; the nature of the service centre provided by the town; the market potential; regional vitality, etc. It follows that for the purpose of this evaluation alternative indicators were considered.

Table 5: Sector specific (agriculture) indicators in three Municipalities).

INDICATOR	Matzikamma	Rank	Oudtshoorn	Rank	BW & MB	Rank
Average rainfall in mm ¹	145,9	1	207,8	3	179,0	2
Number of emerging farms ²	17	2	22	3	14	1
Emerging farmers land as % ²	0,2%	1	0,8%	2	2,1%	3
Emerging farmers dependants ²	291	2	280	3	244	1
Number of food gardens ³	8	1	24	2	57	3
Dependents of food gardens ³	296	3	274	2	99	1
% of food gardens dormant ³	10.1%	1	4.2%	3	5.7%	2
Food gardens for markets (%) ³	6.9%	3	3.7%	2	0.0%	1
Number of commercial farms ⁴	598	3	286	2	264	1
Irrigation land as % of total area ⁴	2,6%	2	7,2%	3	0,2%	1
Arable land as % of total are ⁴	13,9%	3	8,2%	2	0,2%	1
Gross farming income / farm (R) ⁴	504243	3	1419895	2	317928	1
Net farm income per farm (R) ⁴	82587	1	373350	3	99621	2
Farming debt per farm (R) ⁴	621776	2	768570	1	321720	3
Full-time farm employees ⁴	1895	3	1654	2	731	1
Seasonal labour ⁴	2246	3	1325	2	935	1
Wages: full-time employees (R) ⁴	22067	2	23914	3	12608	1
Average		2.1		2.4		1.5
Total Score		36		40		26

Sources: ¹ Department of Agriculture (2009), Geographical Information System Resource Utilization, Elsenburg

² Department of Agriculture (2007), Database on Emerging Farmers Agricultural Statistics, Elsenburg

³ Department of Agriculture (2008), Database on Food Gardens Agricultural Statistics, Elsenburg

⁴ Statistics South Africa (2009), Agriculture 2007 Census

In using this approach it is clear that, from an agricultural perspective, people in the Beaufort West and Murraysburg areas are facing the greatest challenges. Second on the list are Matzikamma Municipality and Oudtshoorn. The people in these towns face a marginally smaller challenge than either of the other two Municipalities.

5. CONCLUSION

Rural development has been under the microscope since the Cabinet of the Western Cape Province decided that rural development must be incorporated with agriculture. The Minister of Agriculture became the Minister of Agriculture and Rural Development, and hence a great deal of attention has been given to rural development. In order for the Department of Agriculture: Western Cape to incorporate rural development into the action plans, a few technicalities had to be cleared.

Firstly the word 'rural' had to be defined. What is rural? Which towns do not qualify? This was resolved by eliminating the Cape functional area according to the OECD Report. Secondly, rural development can't take place if there is no economic potential. Leader towns were identified outside the Cape Functional area which served as starting point for analysis. Thirdly, social indicators were used to identify three potential pilot areas for development. And lastly agricultural indicators were used on the three potential areas to identify agricultural potential and shortcomings.

Data and information on socio-economics and the agricultural sector were gathered and listed. From this, an analysis was done in order to provide the decision maker with defensible evidence why a specific local municipality was chosen to act as pilot area for in-depth rural development. With this "triple bottom down" approach, three pilot areas for rural development were identified. The decision on which area will be developed first lies in the hands of the policy makers, but it must be kept in mind that eventually all rural areas will be developed; it is only a matter of time.

The value of this study lies in the fact that sound guidelines for identification of priority areas are provided, thereby enabling the selection of a target study area in a transparent and multidimensional way. The final choice still remains with the decision maker (albeit the policy maker or researcher), and, in this, common sense also plays a determining role.

REFERENCES

- Department of Agriculture (2009), *Geographical Information System Resource Utilization*, Elsenburg.
- Department of Agriculture (2007), *Database on Emerging Farmers Agricultural Statistics*, Elsenburg.
- Department of Agriculture (2008), *Database on Food Gardens Agricultural Statistics*, Elsenburg.
- OECD (2008) Strategies for Urban Competitiveness and Governance: The Case of Cape Town. *Working Paper on Territorial Policy in Urban Areas*, OECD, Paris.
- PSDF (2009), *Western Cape Provincial Spatial Development Framework*. Department of Environmental Affairs and Development Planning, Cape Town.
- StatsSA (2007) Community Survey 2007. http://www.statssa.gov.za/community_new/content.asp Statistics South Africa, Pretoria.
- StatsSA (2009), *2007 Census of Commercial Agriculture*, Statistics South Africa, Pretoria.
- Van der Merwe, IJ, Davids, AJ, Ferreira, S, Swartz, GP & Zietsman, HL (2004), *Growth Potential of Towns in the Western Cape*. Centre for Geographical Analysis, University of Stellenbosch, Stellenbosch.

Agricultural employment statistics

by Elné Jacobs



The Quarterly Labour Force Survey is a household survey that is being conducted by Statistics South Africa (“Stats SA”) every three months since the beginning of 2008. In 2005, Statistics South Africa started the revision process of the Labour Force Survey (which was conducted biannually from 2000 until 2007), and specialists from the International Monetary Fund (IMF) were approached to help with the restructuring of the survey. The report (that was provided by the IMF researchers) covers aspects like scope, coverage, frequency and timeliness. In response to the IMF report, Statistics South Africa changed the biannual labour force survey to a quarterly survey and also changed the questionnaire¹ slightly. The aim of the Quarterly Labour Force Survey is to collect information about all persons living in South Africa that is of working age (between 15 and 65) (Stats SA 2008a).

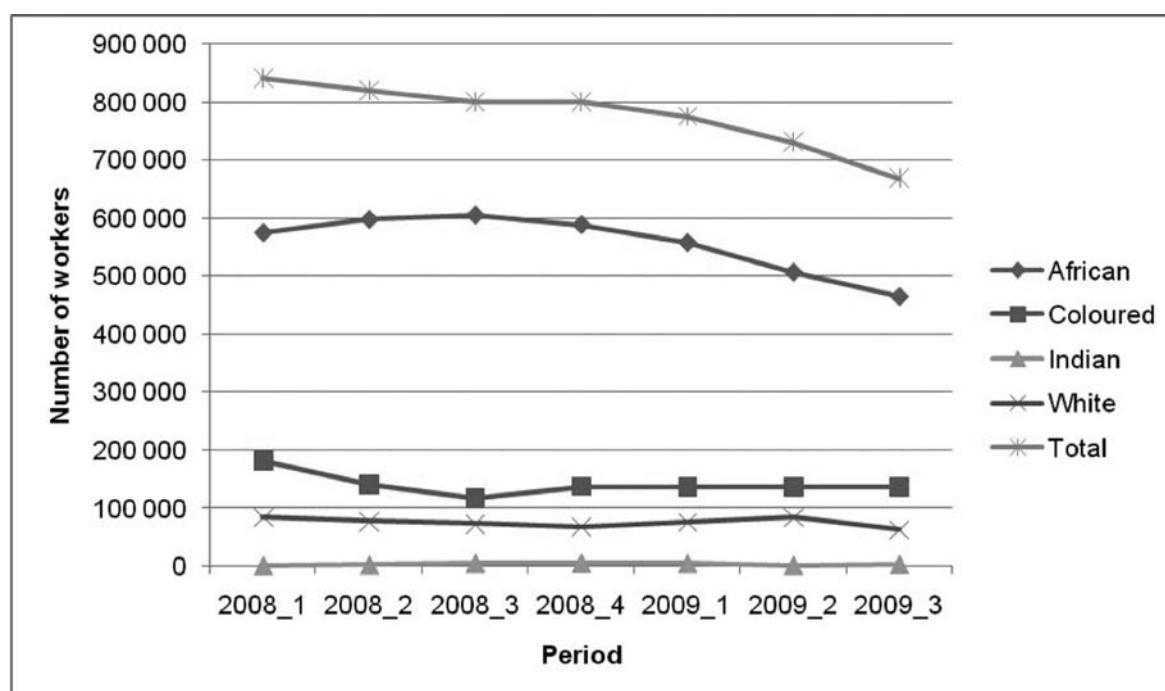
The latest results that were published are those of the third quarter of 2009 (i.e. between July 2009 and September 2009) (Stats SA 2009a). The following analysis is partly based on these results as well as own calculations from the

Quarterly Labour Force Survey dataset. In South Africa, the labour force decreased by 2.4% from 17 495 to 17 077 between July and September, whilst the employment decreased with 3.6% from 13 396 to 12 885. This drop in employment was due to a 3% decrease in the formal sector and a 5.5% decrease in the informal sector quarter-on-quarter. The total labour force of the agricultural sector in South Africa decreased from 730 908 to 668 500 workers between July and September. That is a decrease of 8.5%. The highest decrease in agriculture with regard to gender is that of males that decreased from 494 000 to 430 000 workers, implying a 13% decrease. Females experienced a 2.8% increase in the agricultural sector from a base of 217 000.

In **Figure 1** the total number of workers in the agricultural sector for South Africa is given by population group. The time period is from the first quarter of 2008 (January 2008 to March 2008) until the third quarter of 2009 (July 2009 to September 2009). There is a consistent decrease in total number of workers. The decrease between the first and third

¹ See www.statssa.gov.za/gifs/index.asp for more detailed information

Figure 1: Number of workers in the agricultural sector in South Africa over time



Source: Own calculations from Quarterly Labour Force Survey 2008-2009

quarter of 2008 can be ascribed to a decline in Coloured workers, while the decrease since then can be linked to a decrease in African workers. The number of White workers declined by 32.9% over the entire period, while the number of Indian workers remained negligibly small (with a 65.9% increase over the time period). The African workers on average contribute 71.6% to the total agricultural workforce, whereas the Coloured workers contribute 18.28% on average. The contribution fluctuated between 68.29% in the first quarter of 2008 to 75.53% in the third quarter of 2008. The White workers contribute 9.67% and the Indian workers a slight 0.46% to the total agricultural workforce.

The population that is of working age in the Western Cape increased from 3.49 million to 3.5 million by 0.3% quarter-on-quarter (July 2009 to September 2009), but with 1.3% year-on-year (September 2008 to September 2009). The labour force of the Western Cape consisted of 2.38 million workers in July, but in September, 2.4 million was part of it, implying a 0.9% increase, whilst the population that is of working age increased by 0.3%. The percentages for South Africa are 0.3% and 1.2% respectively. Total employment in the Western Cape decreased from 1.89 million to 1.86 million workers from July to September, implying a 1.6% decrease in employment.

In the Western Cape agricultural sector, employment decreased from 147 000 to 133 000 from July to September, which signifies a 9% decrease quarter-on-quarter, but it must be noted that there was an 8% increase year-on-year (September 2008 to September 2009). The Western Cape together with the Free State are the only two provinces

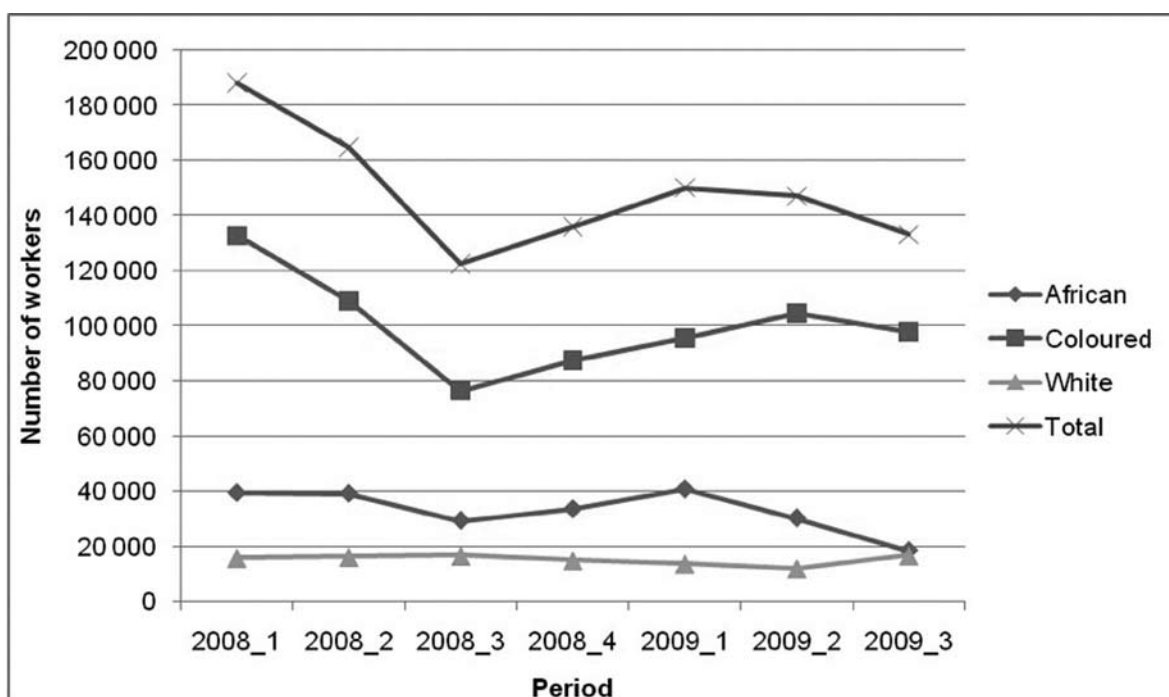
that experienced a year-on-year increase (South Africa's agricultural employment decreased by 14.9%). Questions on subsistence farming and non-market activities were also asked in the survey, but unfortunately the sample size for the Western Cape was too small to draw any statistically significant inferences.

Figure 2 indicates the total number of workers in the Western Cape agricultural sector over the same time period as indicated in **Figure 1**. There was a large decrease in total number of workers from 188 254 to 122 656 between the first quarter of 2008 and the third quarter of 2008, whereafter a gradual increase to 150 233 was experienced until the first quarter of 2009. A slow decrease can be seen since the first quarter of 2009. This trend is reflected strongly in the total number of Coloured workers in the agricultural sector of the Western Cape with White workers' numbers staying relatively constant and African workers' numbers also decreasing since the first quarter of 2009. The number of Coloured agricultural workers in the Western Cape accounted for 70.51% in the first quarter of 2008, and 73.44% in the third quarter of 2009.

In the third quarter of 2009, unemployment in South Africa and the Western Cape amounted to 24.5% and 22.5% respectively. Respondents that stated that they were unemployed, but did work in the past five years, also gave their previous occupation and/or industry of work. In South Africa, 274 311 individuals worked in the agricultural sector before becoming unemployed in the third quarter of 2009 (July to September). The comparable figure for the Western Cape is 44 230 (or 7.71% of the people in the Western Cape) who became unemployed during the third quarter of 2009.

continued on next page

Figure 2: Number of workers in the agricultural sector in the Western Cape over time



Source: Own calculations from Quarterly Labour Force Survey 2008-2009

from previous page

The abovementioned statistics provide a short overview of what statistics are available from the Quarterly Labour Force Survey, as well as the changes in the statistics from quarter two (April to June) to quarter three (July to September).

REFERENCES

Statistics South Africa (2009a). *Quarterly Labour Force Survey Quarter Three Results, Statistical Release P0211*, Pretoria, Statistics South Africa

Statistics South Africa (2009b). *Quarterly Labour Force Survey, First quarter*, Pretoria, Statistics South Africa.

Statistics South Africa (2009c). *Quarterly Labour Force Survey, Second quarter*, Pretoria, Statistics South Africa

Statistics South Africa (2009d). *Quarterly Labour Force Survey, Third quarter*, Pretoria, Statistics South Africa

Statistics South Africa (2008a). *A guide to the Quarterly Labour Force Survey*, August 2008, Pretoria, Statistics South Africa.

Statistics South Africa (2008b). *Quarterly Labour Force Survey, First quarter*, Pretoria, Statistics South Africa.

Statistics South Africa (2008c). *Quarterly Labour Force Survey, Second quarter*, Pretoria, Statistics South Africa.

Statistics South Africa (2008d). *Quarterly Labour Force Survey, Third quarter*, Pretoria, Statistics South Africa.

Statistics South Africa (2008e). *Quarterly Labour Force Survey, Fourth quarter*, Pretoria, Statistics South Africa.