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Farmers' views of landscape initiatives: The case of the Agulhas Plain, CFR

Beatrice Conradie

CSSR Working Paper No. 278

September 2010

Beatrice Conradie is a senior lecturer in the School of Economics and research associate of the Social Surveys Unit at the University of Cape Town.

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Acronyms

ABI	Agulhas Biodiversity Initiative
ANOVA	Analysis of Variance
CAPE	Cape Action for People and the Environment
ESTA	Extension of the Security of Tenure Act, of 1997
PPECB	Perishable Products Export Control Board
PPSA	Protea Producers of South Africa
SAPPEX	South African Protea Producers and Exporters
SAWIS	South African Wine industry Information System
SMA	Nuwejaars wetland Special Management Area (off-reserve conservation project)

Executive summary

The Cape Action for People and the Environment (CAPE) produced an integrated development vision according to which conservation would deliver benefits for local communities. As pilot landscape initiative, Agulhas Biodiversity Initiative (ABI) implemented the CAPE vision in a partnership that promoted sustainable wildflower and tourism industries, as well as a new model for off-reserve nature conservation. The fourth goal was to raise general conservation awareness in the community. Although the *Nuwejaars* Wetland Special Management Area (SMA) is still experiencing significant teething problems, it already conserves more land than the Agulhas National Park and is attracting interest from outside the area. In contrast, the sustainable wildflower harvesting project has received the approval of the scientific community, but has limited appeal for landholders. The sustainable tourism project never took off, and it was decided to hold back on communication until ABI had "good news" to communicate. The overall participation rate in ABI's projects was 35% amongst landholders. The low participation rate could easily be attributed to the decision to scale down communication efforts or to the "unwilling landholder" hypothesis, but it is probably due a fundamental mutual misunderstanding of what landscape initiatives could and could not do for landholders.

The survey reported on includes 75 landholders and 73% of the land on the Plain. The farmers of the Agulhas Plain are predominantly white, Afrikaans-speaking males whose families have lived in the area for a long time. Farm sizes vary from eleven to eleven thousand hectares. At 34% of the average income off-farm income is the single largest source of income for farmers in the area. Traditional farm income from various sources contributes 42% of the average income while biodiversity businesses, including wildflowers, game, thatch reed and tourism, contributes 25% of average income.

Hierarchical clustering on share of income from traditional agriculture and farm size produces three clusters. These are labelled commercial farmers, land barons and lifestyle / conservation farmers. On average commercial farmers derive 84% of their income from traditional agriculture, and have a farm of 916 hectares of which 56% is cultivated. Commercial farmers are not very interested in conservation; only 14% were involved in private conservation before ABI. In contrast lifestyle farmers are very involved in conservation. For this group ABI increased involved in private conservation from 59% to 73% with the SMA. Lifestyle farmers derive 40% of their average income from biodiversity and 55% from off-farm sources. The average farm size in this group is the smallest of the three at 605 hectares, of which on average 42% is cultivated. Land barons are similar to commercial farmers in attitude to conservation, but farm huge pieces of land and have multiple income sources. Their land is least intensively cultivated, at an average rate of 27%.

Landholders identify three main threats to making a living on the land, namely financial pressures, the government and invasive alien vegetation. Commercial farmers are most concerned about finances, while land barons are equally concerned about finances, the government and alien vegetation. Lifestyle farmers rate the government to be the most serious problem. Farmers identify many more opportunities than threats for their livelihoods. More than half can be described as business opportunities. Commercial farmers view food production as the most important opportunity to make a living, followed by opportunities in the external environment. Land barons favour tourism and efforts to strengthen the wildflower industry. They also identify opportunities in the external environment. Lifestyle farmers view tourism as the most important single opportunity. In the decision to participate in ABI size matters (larger farms are more likely to participate), farm type matters (deriving more income from traditional agriculture makes farmers less likely to participate) and education, knowledge of fynbos ecology and previous experience matter (more of all improves participation). The less natural vegetation left on a farm the more farmers are interested in conserving it.

In Section 8 Flower Valley Conservation Trust's experience as wildflower producer is analysed. The NGO owns land on which it produces fynbos wildflowers. The farming operation is for profit, and has generated valuable data on the profitability of the wildflower sector. The picking team's turnover grew rapidly from a very low base over the first three years of its independent existence. By Year 3 the picking operation had turned profitable, recording a 9% profit margin. The picking operation's revenue growth was entirely volume based due to stagnating wildflower prices. The dried flower sector has remained stagnant over the last two decades, while the fresh fynbos sector experienced significant growth associated with cultivation. On a per-hectares basis intensive wildflower harvesting compares favourably with extensive livestock, suggesting a low opportunity cost for switching into wildflowers, although some landholders indicate that they would rather conserve than exploit the fynbos resources on their land. Surprisingly this attitude is equally prevalent amongst commercial farmers, where it explains why the SMA model, which integrates conservation with commercial farming, is so popular.

Section 9 values the wildflower industry at between R9.7 million and R14.4 million and estimates it to create 477 fulltime jobs in the field alone. Since these jobs represent just 8% of the current local unemployment, it is concluded that the industry is unable to generate significant benefits for the local community as a primary occupation. However, as supplementary source of income to be combined with seasonal work in other agricultural sectors and part-time ecosystems restoration in the extended public works programme, the industry could help to generate enough employment to eradicate local poverty and unemployment.

Section 10 concludes that ABI was a success despite not reaching landholders since it achieved cooperation amongst key conservation practitioners. One of the main lessons learnt is that reaching proper consensus is slow, laborious work in which a participative framework is but the first step. The formal framework must be followed up with honest communication, since honest communication leads to trust and trust to cooperation. Cooperation is now sufficiently well established amongst government and NGO officials to be able to take a unified conservation message into the community and plan with it for a more sustainable future.

Keywords: Landscape initiative, integrated development, landholder attitudes

1. Introduction

Community-based conservation has become the holy grail of nature conservation. Proponents of community-based conservation believe that it is easy to convince landholders of conservation-compatible land uses as long as these land uses can be shown to be more profitable than existing enterprises. With this point of departure, the questions of value and profitability arise naturally. In the case of the Agulhas Biodiversity Initiative (ABI), three questions, all considered to be useful for making the "business case" for conservation, were put to the social sciences:

1. What does the fynbos wildflower industry need in terms of economic data collection to be able to accurately describe the industry's value and contribution to society?
2. Is Flower Valley Conservation Trust's wildflower business profitable?
3. What is the current value of biodiversity in use on the Agulhas Plain?

The Protea Producers' association of South Africa (PPSA) and Flower Valley Conservation Trust's farming operation provided the data to answer the first two questions. To answer the third question a landholder survey was conducted on the Agulhas Plain during the winter of 2009. The aggression with which the survey met made it clear quite quickly that there was a serious mutual misunderstanding between local landholders and the implementers of the landscape initiative about the meaning of community-based conservation. As a result, this paper reaches beyond the questions of value to investigate why landholders are so negative about a conservation initiative which is supposedly for their benefit.

The Agulhas Plain, or Strandveld as it is known locally, has received much botanical interest over many years and is now known to be a centre of local endemism (Thwaites & Cowling, 1988, Cowling et al, 1988; Mustart & Cowling, 1992; Richards et al, 1995). Lombard et al (1997) describe a fractured landscape with agriculture and invasive alien vegetation encroaching on what fynbos remains. In addition Heydenrych (1999) also reports a lively wildflower industry and an "expanding tourism and recreation sector". With wildflowers and tourism potential, it is not difficult to see why the conservation community thought it would be easy to make an economic argument for conservation in this setting. However, when farmers say "it is hard to be green when you are in the red" (Richards et al, 2005) they signal that they are not entirely convinced of the win-win-win agenda put forward as community-based conservation. The farmers of the Agulhas Plain elaborate on this perspective by explaining that

"conservation begins after breakfast", by which they mean that conservation is not considered critical for the survival of their farms, as farmers get up long before breakfast to do the work which cannot wait.

The analysis that follows consists of three parts. In Part A, Section 2 provides a context for farming in the Strandveld while Section 3 provides a context for farmers' attitudes to conservation. Part B describes the farmers of the Strandveld. The 2009 landholder survey is introduced in Section 4. The survey failed insofar as it was unable to collect financial data from which the value of biodiversity in use could be estimated. Instead it collected a wealth of information on how farmers view and experience conservation. The picture which emerges is one of a complex rural society, in which commercial agriculture plays a minor and not a major role (Section 5). Section 6 investigates how these farmers see the main threats to and opportunities for making a living on the land. Section 7 investigates landholders' perceptions of and participation in ABI. Part C, which consists of Section 8 and Section 9, takes a broader view of the impact of ABI's sustainable wildflower harvesting programme. Section 8 documents Flower Valley's picking team's experience as wildflower producer, while Section 9 investigates the wildflower industry's ability to bring about conservation and generate significant benefits for the local community. The paper ends with conclusions, including the way forward for biodiversity conservation on private land.

2. Farming in the Strandveld

The Strandveld, according to Lombard et al (1997) an area of 153, 917 hectares, lies right at the southern tip of Africa, in a region called the Overberg. The Overberg comprises the area south of the Sonderend Mountains between the Hottentots-Holland Mountains in the west and the estuary of the Breede River in the east. Although not precisely demarcated, the Plain is understood to be delineated by the Gansbaai, Standford, Napier, Bredasdorp and Struisbaai roads. It is a small area, which due to poor roads was quite remote until recently. The western half of the Agulhas Plain, with Hermanus, as main business centre and seat of a magisterial court, falls under Overstrand local municipality, while the eastern half including Elim, with Bredasdorp as main business centre and seat of a magisterial court, falls under Cape Agulhas local municipality.

The Overberg was settled by Europeans soon after the Dutch East India Company established a permanent refreshment station at the Cape of Good Hope in 1652. The expansion to the east was driven by a search for pasture and

a growing freeholder farmer population (Gilomee, 2002). Initial development took place along the *Kaapse wagenweg* (Cape wagon way), with Swellendam established in 1743 and Caledon following in 1813. A map dated 1800, reprinted in Gilomee (2002), indicates besides Swellendam only Genadendal. Genadendal is a Morawian mission station established in 1737, from which the Elim mission community split off in 1824 (Du Toit, 2004). Table 1 shows that much of the development in and around the Agulhas Plain took place in the nineteenth century, with Bredasdorp established in 1838, Hermanus in 1854 and Stanford in 1857. The light house at L'Agulhas was built in 1849, but the nearby tidal pool only in 1934, when the area began developing as a popular holiday destination for local farmers. By 1920 most of the important settlements in the area had formal municipal status.

Figure 1: Overberg municipal boundaries (www.demarcation.org.za)

Agriculture accounts for a quarter of the local economy both in terms of output and employment (Overberg District Municipality, 2006; Stats SA, 2006). According to the farm census Bredasdorp employs 1, 839 farm workers, of whom 53% are in permanent jobs. In 2002 almost half of Bredasdorp's gross farm income derived from livestock sales and the sale of livestock products, while field crops contributed 38% of the district's gross farm income. Horticulture is unimportant at only 6% of gross farm income. Wheat and barley are the most important types of field crops grown, and comprise 47% and 38%

respectively of the field crop income. Amongst livestock products, milk is twice as important as wool, although sheep sales bring in more than twice the income received from cattle sales. From these statistics it can be inferred that sheep farming is mostly geared towards mutton production, while dairy cattle are more common than beef cattle. Pasture is essential for sheep as well as cattle due to the low carrying capacity of fynbos vegetation (Tainton, 1999). Pasture crops contributed 6% of the income from field crops and accounted for 21% of the dryland area cultivated during the 2002 season (Stats SA, 2006).

Table 1: Development dates for selected Overberg towns

Town	Established	Dutch Reformed Church	Municipal Status
Swellendam	1743	1798	1904
Caledon	1813	1813	1884
Bredasdorp	1838	1838	1917
Napier	1838	1928	
Hermanus	1854		1904
Standford	1857	1926	1919
Gansbaai	1881		1962

(Source: Compiled from Du Toit, 2004)

Bredasdorp magisterial district has performed slightly worse than the national average over the period 1952 to 2002 and significantly worse than the Western Cape fruit districts (Conradie et al, 2009). The district has two distinct agro-ecologies. The Ruens, which lies to the north of the Caledon-Bredasdorp road, is a renosterveld area which is almost fully cultivated and supports most of crop production in the district. The Ruens was first cultivated during the 1930s following the introduction of tractors. In contrast much more of the Strandveld remains uncultivated due to lower soil fertility and seasonal water logging. Traditionally a Strandveld farm just consisted of a *veepos* (outpost for livestock) where a solitary herder kept watch over livestock. Residents say that there was a time when rich Ruens farmers bought cheap land in the Strandveld, but that rich Strandveld farmers are now buying cheap farms in the Ruens. Some people attribute the rise of Strandveld farming to the introduction of lucern (alfalfa) which "breaks open the ground" making it suitable for cultivation. It is unclear whether there is any agronomic merit in this explanation, but planted pastures are closely associated with the rise of agriculture in the Strandveld. What remains untransformed is either too sandy or too acidic to be cultivated productively with current technology. Much of the untransformed land on the Plain lies in the west where it is interspersed with islands of cultivation for

pasturing dairy cows and small orchards which are irrigated from nearby perennial mountain streams.

Over the last two or three decades of the twentieth century local and international pressures changed the reality in which South African farmers operate. Globalisation's downward pressure on commodity prices, combined with the more demanding health and safety standards enforced by European retailers, creates a cost price squeeze which had a significant impact on the structure of Western Cape agriculture (Du Toit & Ewert, 2002; Barrientos & Kritzinger, 2004). Since 1970 real commodity prices of the most important commodities produced in the Strandveld fell by around 1% per year, and in the case of wheat by 1.5% per year. On the cost side, the fuel price rose at 7.4% per year in constant value terms between 1997 and 2010.

Table 2 marks the 1980s as a boom time for local farmers, which they have not experienced since then. With the exception of barley and wool real commodity prices were lower in 2000 than in 1970. The data in Table 2 are national prices, which may not exactly apply to the Overberg. However, they are typical of local prices and give a good indication of the extent of the cost-price squeeze experienced in local agriculture.

Table 2: Selected commodity prices in constant 2008 Rand

Year	Wheat R/ton	Barley R/ton	Milk R/litre	Beef R/kg	Wool R/kg
1970	2,767	1,191	2.95	18	21
1980	3,121	2,711	3.63	30	34
1990	1,942	1,752	2.73	18	26
2000	1,865	1,280	2.13	13	25
2005	1,293	1,454	2.28	21	24
2008	2,329	2,300	3.03	20	30
Annual growth rate 1970 – 2008	-1.5%	-1%	-1.2%	-0.7%	-0.9%

(Source: Department of Agriculture, 2005, 2010)

Government regulation represents a further significant source of additional costs. The minimum wage regulation of the Basic Conditions of Employment Act (no.75 of 1997) substantially increased the cost of employment on fruit farms in the Western Cape, which surprisingly farmers absorbed without shedding much labour in the short run (Conradie, 2005 & 2007). The Extension

of the Security of Tenure Act (ESTA, no. 62 of 1997) on the other hand had little monetary impact but has caused major labour shedding, because it is perceived to undermine the property right of farmers. The new National Water Act (no. 36 of 1998) introduced an ecological reserve and polluter pays principle and laid the foundation of volumetric pricing of irrigation water. It also raised water prices substantially. Later in the same year the National Environmental Management Act (NEMA, no. 107 of 1998) introduced a planning procedure for all new land developments in terms of which the responsibility for biodiversity conservation falls on private individuals. NEMA is not currently enforced, apparently because the conservation status of the various vegetation types, which is a key consideration in granting approval, has not been published yet. When it is published, NEMA's restrictions on additional cultivation will further reduce farm profitability.

3. Overview of ABI's work

By the mid twentieth century "[i]t became fashionable to claim that conventional conservation does not work because it excludes local communities from managing their own land" (Oates, 1999:32). Oates (1999) traces the history of the integrated development in conservation to a meeting in 1970 which for the first time recognised nature conservation as a potential contributor to rural development. This meeting brought together important international conservation organisations (the US Conservation Foundation and the International Union for the Conservation of Nature and Natural Resources) and international donor agencies (the FAO and the World Bank). It was the beginning of what Oates (1999: 50) describes as "a relationship based on financial expediency", whereby conservation funding was conditional on demonstrating benefits for local communities.

In South Africa integrated rural development arrived in the late 1990s, when it was identified as an opportunity to advance conservation on the first post-apartheid government's agenda (Gelderblom et al, 2003). During a biome-wide conservation planning exercise the Cape Action for People and Environment (CAPE) envisioned conservation-based integrated development as follows (Lochner et al, 2003:35):

> "By the year 2020, the natural environment and biodiversity of the fynbos region will be effectively conserved, restored wherever appropriate, and will deliver significant benefits to the people of the

> region in a way that is embraced by local communities, endorsed by the government and recognised internally."

This vision was to be implemented in a number of locally-owned landscape initiatives, with ABI as pilot initiative (Lochner et al, 2003).

ABI's work can be summarised under four themes, namely the development of a new model for off-reserve conservation, ensuring sustainability in the wildflower industry, promoting sustainable tourism, and raising general conservation awareness in the community (UNDP/GEF, 2007). Of these, sustainable wildflower harvesting and eco-tourism were identified during the CAPE planning exercise as crucial for successful implementation and that the value of engaging in conservation-compatible land used might be unlocked by taking advantage of green labelling opportunities in these markets (Lochner et al, 2003; Gelderblom et al, 2003). The approach is premised upon the belief that profitability is a prerequisite for landholder involvement in conservation. I think the experience with ABI clearly reveals exactly the opposite true, namely that conservation is a consumption activity for most landholders rather than an avenue for more profitable production. This is the first of several misunderstandings which jointly shaped the landholders response to the landscape initiative.

While the overall participation rate in ABI was quite low at 35% amongst landholders, there were marked differences across the ABI projects. The project testing the off-reserve conservation model was received best by the community. The purpose with the project, championed by South African National Parks Board, was to find a less expensive and less offensive alternative to fortress conservation. The project is known as the Nuwejaars Wetland Special Management Area (SMA).

Farmers joined the SMA for a variety of reasons, including quite strategic ones, as the following quotes illustrate:

> "The SMA will not generate anything significant for me, but perhaps for my children."

> "We have three simple requirements: First, we keep title deed, second, we keep management control and third, conservation must do better than conventional farming."

The third requirement in the quote above concurs with the notion that a more sustainable land use will only be adopted when it can be shown to be more

profitable than the current land use, but one should also notice the importance that is attached to property rights and farming identity.

Whilst a lack of community control is often a feature of community-based conservation (Hulme & Murphree, 2001; Goldman, 2003), too little involvement is not a problem associated with the SMA. SMA members are successful farmers who view the off-reserve project as a business venture, over which they want as much control as possible. As a result, some SMA members resent tender procedures, which are perceived to be calling into question their business skills. Not complying with tender procedures caused delays in the release of donor funding, which put pressure on implementation. In turn this caused questionable investment decisions in some cases. For example, not all SMA members are in agreement with buying a new fire truck when a good second-hand vehicle would suffice. In spite of its tumultuous first year, however, the SMA to date has recruited 42,000 hectares on 23 properties for conservation, while only 28,000 hectares of land is conserved in the Agulhas National Park.

In comparison the sustainable wildflower harvesting project was less well received by the community. While scientists were concerned with the threat of overharvesting to biodiversity conservation (e.g. Mustart & Cowling, 1992; Davis, 1992; Heydenrych, 1999), the industry was concentrating on cultivation to improve the poor quality associated with wildflowers (Coetzee & Middelmann, 1997). Ironically Coetzee & Middelmann (1997) listed wildfires, invasive alien vegetation and development pressures as some of the main threats for the fynbos industry, since these same factors also have been identified by Rouget et al (2003) as threats to biodiversity conservation. The fynbos industry seemed unconcerned with the dangers of overharvesting in the late 1990s and still seems unconcerned about the problem today. Nonetheless, as an active producer organisation, the South African Protea Producers and Exporters (SAPPEX) participated in the CAPE planning process (Younge & Fowkes, 2003). Flower Valley Conservation Trust, an NGO which owns and operates a wildflower farm in the Strandveld, was set the task of promoting sustainable wildflower harvesting. Flower Valley's work, and the community response to it, is discussed in detail in Section 8. On the whole the sustainable harvesting project's technical objectives were easily met and received the approval of the scientific community, but the trust finds it more difficult to engage with farmers. Consequently, it has decided to promote certification of sustainably harvested fynbos via the South African Protea Producers Association (PPSA), which was set up recently to promote the interest of fynbos primary producers since SAPPEX is no longer perceived to cater to this need.

Little progress was made towards ABI's sustainable tourism goal. In June 2010, at the end of the project, the first tourism research contract still was not signed. A representative of the local tourism association is formally an ABI oversight committee member, but she sees herself as a latecomer to the process, and ABI as being mainly about conservation. While the conservation community considers eco-tourism to be a growth market, clearly the same can not be said of tourism operators on the Plain. Given the limited understanding of the purpose of the landscape initiative in tourism circles, it is perhaps not surprising that so little was done on sustainable tourism focus area.

The UNDP/GEF interim progress report (2007:3) describes ABI final focus area as creating "increased local support for biodiversity conservation in the Agulhas Plain … through an informal awareness program." According to the oversight committee, communication was held back on until ABI had something to report, although general education programmes were conducted in local schools. Some ABI partners recognise that it was a mistake not to communicate and raise awareness around conservation, but say that they did the best they could under the circumstances. Perhaps lacking experience with international donor agencies, some of these local decision makers feel that they could not promise and plan for uncertain funds, and therefore could not promote ABI more vigorously amongst landholders while still waiting for funds to arrive. Instead much of the oversight committee's effort went towards establishing a public-private partnership. This work was made difficult by the cultural differences that exist between the government officials who were predominately Afrikaans-speaking and the NGO representatives who were predominantly English-speaking. Given the cultural differences, it is not surprising that the core group of ABI partners found it difficult to agree on what to communicate.

The common theme emerging from this brief overview of ABI's work is the question of ABI's relevance for the community at large. Part of the problem can easily be ascribed to the decision to scale the communication strategy or to the so-called 'unwilling landholder' hypothesis, but there might be a more serious problem with the relevance of community-based conservation. In 2009 an ecologist living and working in the Strandveld made the following statement:

> "ABI fails at the implementation stage. The implementers need to really understand the dream."

Perhaps this comment hints at the root cause of the lack of participation in several aspects of ABI's work. A development vision in which economic growth is balanced with ecological sustainability and social redistribution has general appeal and is easy to do on paper. As in Figure 2, it is often illustrated with three

overlapping circles, usually with the ecological circle shown at the top. This arrangement carries a hidden message that conservation supersedes growth or redistribution goals. I think the integrated development message was rejected by the Agulhas Plain community, because they perceived a ranking of goals where none may have been intended, and rejected it. A number of stakeholders, including tourism and local government, chose not be involved with implementing the CAPE vision, because conservation is not perceived to be part of their mandate. The *boerevereniging* (farmers' association) kept a foot in the door, but sent female representatives to ABI meetings. The official explanation is that farmers' wives have more time for committee work than their husbands, which in all fairness is probably so. However, where there is a really important issue at hand, for example the construction path of new power lines through the district, the men turn up for meetings in large numbers. Had the men thought ABI to be important, they would have nominated male representatives for the *boerevereniging* to ABI's oversight committee. The fact that they did not, tells us that they do not consider ABI to be relevant or important for them.

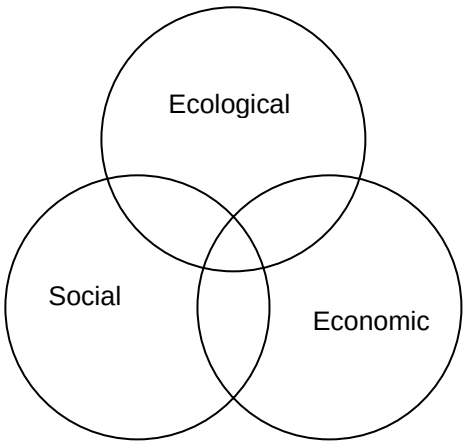


Figure 2: A representation of integrated development goals

Except for a few individuals genuinely committed to conservation, the voice of landholders was not heard in ABI. The voice of the business community was entirely absent. It is important to note however, that the absence of the broader community in ABI's deliberations resonates with the absence of the voice of the general public when it came to endorsing the CAPE vision (Younge & Fowkes, 2003). The question is if CAPE' vision and ABI's implementation of it could have been formulated differently without compromising the values of conservation. I think the answer is probably not. However, as long as conservation is perceived by the wider community to the sole motive for landscape initiatives and economic benefits merely the by-product handed down to communities, ordinary people will reject integrated development plans for

conservation and, community-based conservation will continue to face an uphill battle in implementation.

4. The 2009 landholder survey

The main aim of the 2009 land use survey was to establish the value of biodiversity in use. The piloting process soon made it obvious that landholders would not discuss financial figures during a first wave of interviews. Being Afrikaans-speaking and having several family ties to the Bredasdorp community, I expected my insider status to guarantee a good response rate as it had done in previous farm surveys. However, in the Strandveld being associated with ABI was a disadvantage that outweighed the advantage of insider status. When it became obvious that financial data would not be shared, the questionnaire was adjusted to be more qualitative and collect data on attitudes to and participation in ABI and its projects.

The sample was drawn from the membership of three local branches of the *boerevereniging*, a farm tenant list for the coloured community at Elim, and a third catch-all group of lifestyle famers and wildflower producers taken from an earlier Flower Valley scoping exercise. Since no complete record exists of the landholders on the Agulhas Plain, a sampling rate cannot be calculated. However, the current survey achieved 73% coverage in terms of land area, compared to Heydenrych's (1999) survey which covered 57% of the area. The overall response rate was 82%, varying from 68% for the Elim land tenants to 89% for the commercial farmers. Personal interviews were conducted in the home of the respondent once people have agreed over the telephone to be interviewed. The interviews took place in July, which is a quiet season for most farmers, although not for wildflower producers. The average interview took 47 minutes, with only 15% of interviews lasting for less than half an hour. Although the overall response rate was not particularly low, the survey was met with some aggression and much suspicion.

Table 3 reports selected descriptive statistics. The sample consists predominantly of white, Afrikaans-speaking males who belong to the *boerevereniging* (farmers' association). There are slight differences in the average age and farming experience of Afrikaans-speaking coloureds, Afrikaans-speaking whites and English-speaking whites but none of these differences were statistically significant. The average and median age of the sample is 49 years and 47 years respectively. Assuming that people start school at age six, the average working life after correcting for formal education is 30.9

years. A large part of these working lives has been spent farming, on average 19.6 years. The median farming experience is 16 years. With local schools only going up to standard 6, the remoteness of the Plain has had an impact on the average levels of education for the different sub-groups in the sample. On average, coloured respondents have had 9.9 years of formal schooling, while Afrikaans-speaking whites have had 12.4 years of schooling. This is significantly less than the average of 14.8 years recorded for English-speaking whites (F-stat = 16.54, p = 0.000).

Much of the social capital in the area is tied up in the *boerevereniging*. The organisation aims to educate as well as entertain, and wives are invited to meetings even if they are not involved with running the farm. *Boereverenigning* membership is considered a badge of acceptance, and lifestylers sometimes join for this reason alone. Some wildflower producers, on the other hand, see little point to belonging to the *boerevereniging* since all the other farmers talk about is "cows and disease". In contrast to the *boerevereniging*, ABI participation is low (also see Section 7), and involvement in other producer organisations or study circles virtually non-existent.

Table 3: Sample descriptive statistics

Descriptor	units	n	mean	std deviation
Age	years	75	49.1	11.5
Education	years	75	12.2	2.4
Farming experience	years	75	19.6	13.8
Farm size	ha	69	1,636	2,435
Gender	1=male	75	0.87	
Home language	1=Afrikaans	75	0.88	
Race	1=white	75	0.81	
Boerevereniging	1=yes	75	0.75	
Study circle	1=yes	74	0.18	
Protea Producers of South Africa	1=yes	74	0.12	
ABI	I=yes	75	0.35	
Private conservation	1=yes	73	0.47	

The average farm size for the area is 1,639 hectares, but farm size varies considerably. The maximum farm size reported is eleven thousand hectares, while the minimum reported landholding was eleven hectares. Almost 20% of

the group hold a hundred hectares or less, while a viable farm is considered to be in the order of 500 to 600 hectares. The high proportions of respondents who indicate involvement with private nature conservation together with Table 4, which illustrates the composition of average income on these farms, confirms Heydenrych's (1999) finding of a large lifestyle component in the farming community of the Strandveld.

When the many livelihoods in Table 4 are summarised as traditional farm, biodiversity and non-farm income, an interesting picture emerges. First of all, income patterns on the Agulhas Plain have remained stable over the last then years. The small differences which exist are probably due to sampling as much as real change.

Table 4: Average income structure in the Strandveld in 1999 and 2009

	Share of income (%)	
Enterprise	**2009**	**Heydenrych, 1999**
Non-farm income	**34**	**31**
Wildflowers	17	28
Cultivated fynbos	–	5
Thatch reed & thatching	3	–
Tourism	3	0
Fire wood from invasive aliens vegetation	1	1
Game farming	0	–
Beekeeping	–	0
Biodiversity based income	**25**	**34**
Livestock (cattle & sheep)	17	23
Winter grains	6	5
Dairy	13	5
Wine grapes	5	–
Vegetables	2	–
Other agriculture	–	2
Traditional farm income	**42**	**35**
Total	**100**	**100**

In both surveys non-farm income was the most important single source of income; in 2009 non-farm income contributed 34% of the average income. Non-farm includes pensions, all salaries including salaries earned as farm managers or in conservation, and business and investment income. Biodiversity income, from wildflowers, thatch reed, nature-based tourism, beekeeping and firewood collection, was down slightly in 2009 compared to 1999, mainly due to a smaller contribution from wildflowers and cultivated fynbos. The contribution of sustainable tourism increased from virtually zero to 3%. Currently only 7% of respondents are involved with tourism but on average they earn 40% of their income from it. Local tourism enterprises high-end nature-based tourism which sells biodiversity to farm holidays for which a pretty stand of flowering acacias is worth as much a pristine fynbos landscape.

In Heydenrych's 1999 survey, farm income, dominated by livestock, contributed 35% of average income. Over the next ten years the share of traditional agriculture increased marginally to 42%, and dairy increased in importance at the expense of other livestock. A shift to dairy indicates financial pressure as the dairy industry is well-known for its reliable cash flow and small capital requirement. In addition the contribution of grains declined, while wine grapes grew from nothing to 5% of average farm income. However, very few farmers have sufficient capital to act on the potential of wine grape farming; only two farmers planted grapes during the 2009 season while another 13% indicated that they plan to in the near future.

5. Are local farmers a homogenous group?

The large number of livelihood strategies listed in Table 4, suggests possible subgroups in the farming community. Heydenrych's (1999) identified commercial and other farms for the Agulhas Plain, referring to the latter category as conservation farms. Petrzelka et al (1996) as cited in Maybery et al (2005) contrasts conventional farmers with sustainable farmers, while Maybery et al (2005) defined lifestyle, economic and conservation attitudes. In Maybery et al (2005), as in much of the literature on farmer behaviour with respect to conservation, the implied causality runs from attitudes to actions. Differences in attitudes are then explained by variations in farmers' ties to the land, their financial circumstances, farm characteristics, knowledge of nature and so on (see Winter et al, 2007 for a local application).

The common approach is to investigate values or attitudes with a set of Lickert scale statements subjected to principle component analysis. Cluster analysis is

non-parametric alternative, for testing if natural groupings in the data, here landholders, show significant differences with respect to any of the characteristics of interest (Everitt, 1977). SPSS's two-step clustering procedure was used. The two-step procedure is a form of hierarchical clustering, in which the distance minimising number of clusters is chosen based on a specified distance measure and algorithm. In the first step the variables on which the clustering is done are scaled automatically. The scaling is important since the clustering procedure will always emphasise variables with the largest variance. For example, if farm size is measured in hectares and proportion of income on a scale of zero to one, the emerging clusters will be dominated by farm size effects. A cluster feature tree with a maximum of three levels of nodes and eight entries per node was specified. The distance measure was log likelihood and the number of clusters was determined based on a Bayesian information criteria loss. The two-step process simultaneously minimises the Bayesian information criteria and selects for a large ratio of distance measures.

When clustering on farm size and share of income from conventional farming, three clusters emerge. These are described in Table 5. The cluster labelled "commercial farmers" represents 42% of the sample and 24% of the farmland. The group labelled "land barons" represents 14.5% of the respondents and 60% of the land, while the "lifestyle / conservation" cluster represents 43.5% of the respondents and 16% of the land. Five observations could not be clustered due to missing farm size data. It is gratifying to see that the three clusters differ significantly in terms of total farm size ($p = 0.0000$) and share of income from traditional agriculture ($p = 0.0000$), since the clustering was done on these variables. Given the significant difference in total farm size it is not surprising that there is also a significant difference in the cultivated area ($p = 0.0000$), but it is interesting that the proportion cultivated of individual farms varies more between clusters than within clusters ($p = 0.0221$).

The first cluster is labelled commercial farmers, because members of this group on average derive 84% of their income from conventional agriculture. On average commercial farmers hold 916 hectares of farmland, of which 58% is cultivated. The farms vary in size from 23 to 3,200 hectares, with a median farm size of 210 hectares. The average commercial farm has 435 hectares of untransformed land and the total potential for conservation in the group is 12,600 hectares on 29 properties. In correspondence with the strong focus on farming, this group is characterised by a lack of interest in private conservation. Private conservation efforts on Strandveld farms include stewardship programmes, conservancies as well as private nature reserves, all of which were encountered during the field work. Before ABI 14% of commercial farmers

were involved in private conservation, and as a result of the SMA this proportion has increased to 34% of the group.

The next cluster, characterised by massive landholdings and a balanced portfolio of income sources, is labelled land barons. The median farm size in this group is 6, 750 hectares and the maximum size is 11, 000 hectares. Amongst others land barons are large commercial farmers, on average cultivating 1,802 hectares and deriving 38% of their income from traditional agriculture. However, their land is least intensively cultivated (only average only 27%). As a group land barons control 63% of the untransformed land in the sample, and could be considered the low hanging fruits for conservation. Prior to the establishment of the SMA only 20% of land barons were involved in private conservation, but the SMA project increased their involvement with private conservation to 60% of the group on a head count basis.

Table 5: Description of farm clusters

Description	**Commercial (n=29)**	**Land barons (n = 10)**	**Lifestyle / conservation (n = 30)**	**ANOVA**	
				F-stat	**Prob.**
Farm size (ha)	916	6,814	605	117.85	0.0000
Cultivated area (ha)	346	1,802	87	17.84	0.0000
% cultivated	56%	27%	42%	4.04	0.0221
Farm income	84%	38%	5%	90.88	0.0000
Biodiversity income	9%	31%	40%	5.73	0.0051
Non-farm income	7%	31%	55%	13.74	0.0000
Private conservation	14%	20%	59%	4.82	0.0114
Private conservation including SMA	34%	60%	76%	2.514	0.0888
Afrikaans speaking	90%	100%	80%	1.48	0.2346
Education (years)	11.5	13.1	12.9	3.22	0.0463
Family tenure (years)	70	97	51	2.11	0.1298

The third was labelled cluster lifestyle / conservation farmers, since members of this group derive 55% of their income from non-farm sources and 40% from

biodiversity businesses. Lifestyle farms vary in size between eleven and 3, 089 hectares with an average farm size of 605 hectares and a median farm size of 210 hectares. A surprisingly high proportion of lifestyle farms are transformed (42%), although much of it lies fallow or is being restored by its current owners. The median size of untransformed land on lifestyle farms is only 89 hectares and the group controls a mere 8% of the untransformed land in the sample. Lifestyle farmers are characterised by a high involvement in private conservation, with 59% involved in some form of private nature conservation even before ABI came about. The SMA has increased participation in private conservation to73%.

The perception exists that more often than not lifestyle farmers are *Engelse mense* (literally English people, slightly derogatory local term for outsiders) who bring different values into the community, for which they are often severely criticised. *Engelse mense* in turn say locals are backward, uneducated and "rapers of nature". This raises several questions, for instance if the lifestyle / conservation cluster has a significantly larger English-speaking component than the other clusters or more formal education or a shorter tenure on the land. According to Table 5 there are not significantly more *Engelse mense* in the lifestyle cluster, although there is a significant difference in education levels across the groups ($p = 0.0463$.) The difference is family tenure is also marginally significant ($p = 0.1298$); the family of land barons have lived on their land for an average of 97 years, compared to 70 years in the case of commercial farmers and 51 years for lifestyle farmers.

The most important implication of these results for conservation managers is that financial considerations are not the only factor in influencing whether or not a person will become involved in conservation. Instead it is important to understand the hopes and fears of each group and how it affects conservation decisions.

6. Landholder assessments of threats and opportunities for making a living on the land

The data analysed here are the responses to the question "Please rate the following factors as opportunity or threat for your business". Three alternatives were given, namely "threat", "opportunity" and "neutral". Apart from the "threats" of environmental regulation, a particular factor was classified as an opportunity or threat based on which of these two categories received the most responses. For example, if an item was considered an opportunity by 30% of the

group, a threat by 10% and neutral by 70%, it was classified as an opportunity and listed with a 30% rating in Table 8. Significant differences are established with a single variable ANOVA at a 20% significance level; were differences are not significant, only a sample mean is reported. The reason for combining opportunities and threats in one question is that some factors, for instance the National Park, are considered a threat by some people and an opportunity by others. The structured questions were followed up with open-ended questions about the greatest opportunity and the greatest threat for the area. Presenting farmers with a set of threats were previously found to be an efficient way of establishing sympathy with respondents, as it allows a relatively free discussion of farmers' fears which gets complaints out of the way before continuing with the interview. In this instance, however, the actual assessments of the potential threats are of direct interest, although the results of the open-ended question were found to be more useful that the results of the structured question.

General risk assessment

Table 6 indicates that all farmers care about money and that none are particularly concerned by social and environmental threats. Financial threats were modelled with a cost price squeeze, dumping of subsidized (agricultural) commodities on the South African market and fuel price increases. Sharply rising fuel price were particularly topical when the field work was done. In 2006, the price of diesel at the coast was R7.23 per litre in constant value 2009 Rand. Two years later it had shot up to R9.85 only to return to R6.51 in 2009. While every-one agreed on rising fuel prices being a threat, commercial farmers were still significantly more likely than the other groups to consider it a problem (F-stat = 2.2287, p = 0.0772). Falling commodity prices combined with rising input costs create a cost-price squeeze which is considered a risk by 92% of commercial farmers and 82% of the lifestyle / conservation cluster, but only by 50% of land barons. This is a surprisingly result since the cost price squeeze is generally considered a feature of the agricultural section, which, according to Table 5, seems to be more important for land barons than lifestyle farmers. On the output side of the cost price squeeze dumping of subsidised farm commodities is considered a threat by 89% of commercial farmers, which is significantly more than the proportion of lifestyle farmers or land barons who recognise this factor as a threat (F-stat = 6.082, p 0.0039).

The effect of socio-political pressures on the perceived survival of farm businesses is measured by perceptions of the threat of poverty and crime, land reform and ESTA. Poverty, and the crime that results from it, is considered a

threat by 61% of the group. There is no difference between the views of the three clusters on this matter. The same is true of land reform and ESTA which are considered a threat by 35% and 34% respectively. An unspecified "government" variable produced the same result. It was considered a threat by 35% of the group, but in this case there were marginal differences between the clusters, with the lifestyle and commercial clusters being more negative than land barons, who apparently have sufficient wealth to feel secure from government regulation.

Table 6: General assessment of sources of risk by cluster membership

Description	All (n=75)	Commercial (n=29)	Land barons (n = 10)	Lifestyle / conservation (n = 30)	ANOVA F-stat	ANOVA Prob.
Cost price squeeze		93%	40%	82%	7.569	0.0011
Dumping of commodities		89%	50%	50%	6.082	0.0039
Rising fuel price		100%	80%	85%	2.668	0.0772
Poverty & crime	61%				1.033	0.3618
Land reform	35%				0.174	0.8407
ESTA	34%				0.834	0.4393
"The government"	35%	37%	10%	42%	1.717	0.1883
Int. interest in fynbos	9%				0.149	0.8615
Agulhas National Park	11%				0.768	0.4685
Expanding the Park	24%				0.892	0.4149
Power station & lines	75%				0.3257	0.7233

* Not all observations could be clustered due to missing income data

The threat of environmental regulation is measured by three items including the international interest in fynbos, the establishment of the Agulhas National Park (in 1990), as well as the continuing expansion of the park. The three clusters hold the same opinions on these environmental threats. The international interest in fynbos and the existence of the park are considered a risk by only 9% and 11% of farmers respectively. There is somewhat more objection to the park expanding, with 24% of the group considering expansion a threat. Commercial

farmers' reservations about the Agulhas National Park are two-fold: on the one hand the Park is seen as a breeding ground for predators and alien vegetation, both of which are perceived to have negative impacts on neighbouring farms. On the other hand the park is considered a waste of productive land. A young man recounted an emotional story of how his friend's family farm was bought for the park, only to be "abandoned" once the friend was moved off the land. He fears the same happening to his farm and as a result will go out of his way to avoid all contact with conservation. His view echoes what Richards et al.'s (2005) called a productivist ethic amongst cattle farmers in Australia. If there is a productivist ethic at play however, it is strange that more commercial farmers did not register an objection to the park or the expansion thereof.

Three in four respondents indicated their concern over the proposed nuclear power station on the coast at Batamsklip. It is curious that the power station is so widely regarded as problematic, since it is unlikely to impact people outside its immediate vicinity. Some respondents gave a more nuanced response, distinguishing between the power station on a remote coastline, which is viewed as unlikely to impact them, and the more direct impact of transmission lines crossing their land. Others were optimistic about the opportunity to rent accommodation or sell land during the project's construction phase. The widespread negative attitudes to the power station are an indication of how effectively the community could be mobilised around an environmental issue.

Most serious concerns for landholders

In the open-ended follow-up question on what farmers consider to be as the most important threat contradicts some of the results presented in Table 6. Table 7 lists the matters raised by farmers in order of declining order of frequency, while Figure 3 represents the most serious threats for each cluster separately. Multiple responses were recorded where offered and 75 of the 80 responses could be assigned to a particular cluster.

Nineteen people identified some aspect of financial strain as the most serious concern for the survival of their business. According to Figure 3, which illustrates the composition of factors identified within each clusters, finances are a concern for commercial farmers and land barons, but not to the same extent for lifestyle farmers. In more than half the cases the issue of financial pressure was raised by commercial farmers, confirming Richards et al.'s (2005) finding that commercial farmers tend to equate secure finances with sustainability. It is

surprising that financial concerns are also important for land barons, as large landholdings could be interpreted as a sign of wealth.

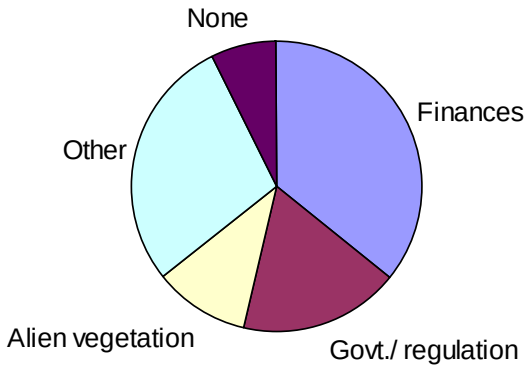
Table 7: Most important threats by cluster membership

Description	All (n=75)	Commercial (n=29)	Land barons (n = 10)	Lifestyle / conservation (n = 30)
Financial pressures	19	10	3	4
Regulation / government	14	5	2	7
Invasive aliens & resulting fire	13	3	2	7
Other environmental problems	7	2	–	4
None	7	2	2	3
Crime / poverty	5	3	–	2
Absent landlords	4	1	–	1
Lack of cooperation	4	1	–	4
Power station & lines	4	–	1	3
Distance to markets	2	1	–	1
Lack of education	1	–	–	1
Total	80	28	10	37

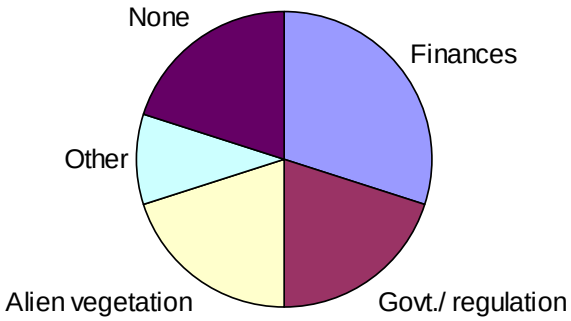
*Not all observations were clustered due to missing income data, multiple responses

When it comes to the government, one should remember that the sample contains 19% coloured farmers, who might view the government as a potential source of help rather than a threat. This is not to say that all coloured farmers approve of the government of the day; in fact, commercial coloured farmers are as critical of the government as their white colleagues, and are as critical of the new black government of the day as they were of the old white government under apartheid. There is an interesting contradiction between how unimportant government was rated in the general assessment of risk and how important it seems to be on the list of most serious threats, especially for lifestyle farmers who rate the government as a problem on par with invasive alien vegetation.

Commercial



Land barons



Lifestyle / conservation

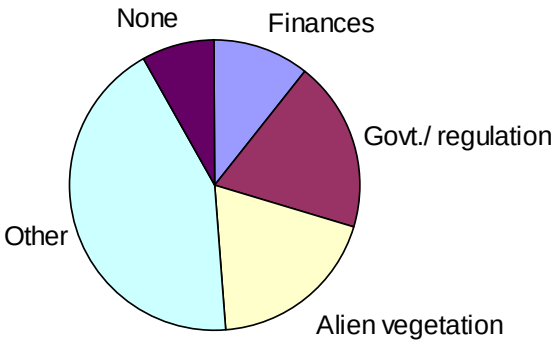


Figure 3: Main threat by landholder type (n = 80, multiple responses)

A possible explanation for the contraction is that lifestylers are not concerned with the government's official land reform policy, which they consider to be ineffectual, but with the government's unpredictability and lack of service delivery. This group uses the government's inability to get rid of invasive alien vegetation locally as an example of its inefficiency. The local response is to question and criticise, in order to "keep government officials on their toes". Cape Nature officials are criticised for "filling positions", rather than "doing the job" and ABI is described as being "all about talk, and not enough about action". This behaviour showed up in some of the conflict experienced in ABI's oversight committee, where government officials sometimes felt themselves unreasonably attacked. The high take-up rate in the SMA project is probably part of the same phenomenon. Farmers join the SMA because they feel that they can do conservation as effectively as any official (who does not have the same ties to the land as them). SMA membership is dominated by commercial farmers, and not by lifestylers, which implies that the unease with government is widespread, whether people care to admit it or not.

The threat of invasive alien vegetation is rated differently by the three groups. Commercial farmers are less concerned (11% identified it as the main threat) than lifestyle farmers and land barons (20% of whom identified fire as the main threat). Controlled burning is a familiar land management practice in the Strandveld, used to improve grazing and rejuvenate wildflower land. It is agreed that the best season to burn fynbos is in autumn, as soon as the first rains have fallen. Some farmers combine burning with seed augmentation and / or ploughing to increase germination of desirable wildflower species (Treurnicht, forthcoming). Farmers attribute the alien vegetation problem variously to herders no longer being used in livestock farming, the greed of wildflower producers and absent landlords. In the past solitary herders living at stock posts managed grazing with *skilpadbrandjies* (tortoise burns, i.e. small, slow fires); when herders were replaced with fenced camps, the fuel load gradually grew out of control. Local farmers speak of people "being afraid to burn" due to the high fuel load, but also of excessive red tape with getting permission to burn, and fire legislation which holds farmers responsible for the damage arising from fires originating on their land. Fear of burning is a minority view however, since only seven of the 31 people who mentioned fire, said they were afraid to burn.

General assessment of opportunities

Table 8 reports the general assessment of opportunities for making a living in the Strandveld. Everyone agrees about the potential of tourism, wildflowers,

charcoal making and the demand for lifestyle farms. One would have expected commercial farmers to be less enthusiastic about these non-traditional enterprises, but apparently even commercial farmers see potential in tourism. Perhaps commercial farmers' enthusiasm for these biodiversity businesses indicates the desperation of local agriculture. Surprisingly carbon trading received substantial support, since local farmers have almost no experience of the carbon trading process. It was recently established that renosterveld could accumulate up to twenty tons of carbon over twenty years if left fallow (Mills et al, 2010). Although none of the farmers referred specifically to Mills' research or renosterveld, it is possible that landowners in the more marginal parts of the Southern Cape have already been approached to discuss the possibility of carbon trading, and that this information is the reason why carbon trading is rated so highly. As expected, there is more support for carbon trading amongst lifestyle farmers and land barons than amongst commercial farmers.

Viewed as the only remotely profitable farm enterprise, wine farming is considered to be a threat to biodiversity conservation on the Agulhas Plain (Heydenrych, 1999). Almost 50% of landowners see wine farming as an opportunity but there are significant differences across the groups (F-stat = 1.852, p = 0.1658); lifestylers and land barons are less enthusiastic than commercial farmers of whom 59% consider wine farming as having potential for the Strandveld.

The significant support for wine farming is grounds for concern about the potential impact on biodiversity, especially given the income differentials between wine and grain or livestock (see Section 8). Nonetheless the wine industry is unlikely to have a significant negative impact on biodiversity on the Agulhas Plain. Firstly, most of the existing vineyards were planted on old wheat fields and there is substantially more abandoned wheat fields than there are ever likely to be vineyards. The reason for this is a lack of irrigation water; the average farm has 462 hectares of cultivated land and only fifteen hectares of irrigation. The increased adoption of the Biodiversity in Wine Initiative's (BWI) principles, which include set-asides and restoration where appropriate, will further limited the damage done by a wine industry in the Strandveld, in addition to NEMA regulations. Thirdly, wine grapes are a capital intensive industry and local farmers are capital constrained to the point where only 14% of the group have actual plans to plant vineyards in the near future. The only real source of danger is rich outsiders who may want to invest in wine farms in area, especially those who are running out of land in Stellenbosch. It is important to note, however, that wine farming was not mentioned once as the greatest opportunity for the area, while property development was mentioned four times.

Table 8: General assessment of opportunities by cluster membership

Description	All (n=75)	Commercial (n=29)	Land barons (n = 10)	Lifestyle / conservation (n = 30)	ANOVA F-stat	ANOVA Prob.
Tourism	86%				0.357	0.7014
Wildflower harvesting	72%				0.747	0.4783
Charcoal	71%				0.583	0.5614
Demand for lifestyle land	54%				0.774	0.4658
Carbon trading	58%	44%	70%	67%	1.731	0.1860
Wine grapes	46%	44%	59%	33%	1.852	0.1658
Game farming		33%	80%	48%	3.396	0.0400
Agulhas National Park		25%	80%	67%	8.193	0.0007
Park expansion		14%	40%	37%	2.277	0.1111
ABI	38%				0.959	0.3888
Flower Valley	32%				1.617	0.2067
Interest in fynbos	67%				0.645	0.5280

* Not all observations were clustered due to missing income data, multiple responses

Lifestyle farms represent another potential source of harm to biodiversity. While some lifestyle farmers are avid conservationists (Heydenrych, 1999), there is a risk for holiday properties to be invaded by alien vegetation and infested by predators. Given all the complaints about *Engelse mense,* a surprisingly high 54% of the sample considers the demand for lifestyle farms to be an opportunity for the Strandveld. Table 8 indicates that game farming is considered to have synergies with the Agulhas National Park, especially amongst land barons who are significantly more positive about the potential of game farming and the existence and expansion of the park.

Table 8 contains an interesting contradiction. Farmers support biodiversity businesses, but they do not support ABI or Flower Valley Conservation Trust. Perhaps this implies resistance to the way in which the conservation message was communicated or to the way in which conservation projects are managed. In

addition locals doubt that outsiders are able to find the right solutions to problems the community has grappled with for a long time.

Greatest opportunities

Table 9 summarises the greatest opportunities for making a living in the Strandveld, under three headings, namely business opportunities (53% of the suggestions), opportunities for changing local institutions (17%) and opportunities that arise externally (11%). Tourism heads the list by a substantial margin, which is curious given its small current contribution to the average Strandveld income. Support for tourism comes mainly from the lifestyle/ conservation cluster. In the majority of cases, respondents specifically referred to fynbos tourism, although wine tourism and farm holidays were also mentioned.

Despite its low contribution to average income, there already exists a broad base of tourism infrastructure on the Agulhas Plain; 21 respondents (30%) operate accommodation facilities, while 47% intend to expand their tourism activities. The new tarred road connecting Gansbaai to Bredasdorp via Elim is an important reason for the optimism about tourism, but it remains to be seen to what extent local people will secure the capital to be able to begin tourism businesses. The majority of local tourism offerings do not emphasise fynbos. There are plans afoot to use wine farming as a tourist draw card to be combined with experiences, but none of these plans explicitly rely on fynbos biodiversity. There are two examples of high-end tourism establishments which do attempt to sell fynbos biodiversity, but the owners of these businesses have indicated that one needs to educate the general public about fynbos for people to become interested in it and that they sell peace and quiet as much as fynbos biodiversity. By implication, an appropriate education campaign and developing a package of local attractions which includes biodiversity alongside more recognisable attractions such as peace and quiet will be essential for establishing a sustainable tourism sector in the Strandveld.

Table 9: Most important opportunities by cluster membership

Description	All (n=75)	Commercial (n=29)	Land barons (n = 10)	Lifestyle / conservation (n = 30)
None	**8**	**4**	**0**	**4**
Tourism	15	4	2	7
Food production	9	8	0	1
Integrating agriculture & conservation	5	1	1	2
Coastal property development	4	0	0	2
Exotic crops	2	1	0	1
Wind power	2	1	0	0
Business opportunities	**37**	**15**	**3**	**13**
Stronger fynbos supply chain	9	2	2	5
Local cooperation	3	1	0	1
Institutional opportunities	**12**	**3**	**2**	**6**
Government projects	7	3	0	3
Deregulation	3	0	1	1
General economic recovery	3	1	1	0
External opportunities	**13**	**4**	**2**	**4**
Total	**70**	**26**	**7**	**27**

* Not all observations were clustered due to missing income data, multiple responses

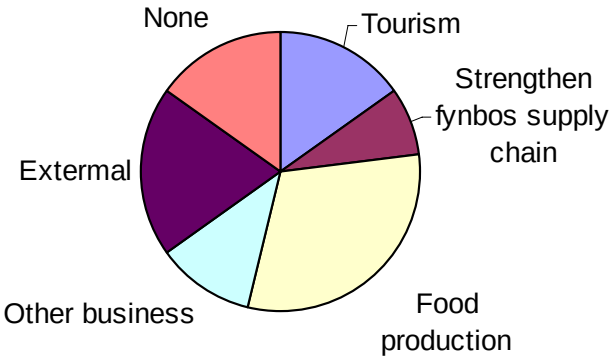
Local farmers feel very strongly that something drastic needs to be done about the fynbos supply chain. Some people would like the landscape better protected through a strengthening of Cape Nature's fynbos permit system, while other suggestions are to build economies of scale in supply and establish a unified marketing campaign locally and aboard. All these suggestions have been placed under the opportunity for institutional reform in the fynbos industry in Table 9.

In some cases the proposals were made by members of Flower Valley's pilot group of certified suppliers, but there are clearly other wildflower producers who also support the idea of greater cooperation with the fynbos industry although they are not prepared to work with Flower Valley. Section 8 will explore some of their reasons. Fynbos is the only biodiversity-based industry to contribute substantially to farm income at the moment (Table 4). It contributes 17% of the average total and two thirds of the average biodiversity income. A full 44% of landholders derive some income from it, on average 39% of their income. Vertical integration in the fynbos market would improve farm gate prices of wildflowers, which have been falling in real terms between 2006 and 2008 (Conradie et al, forthcoming).

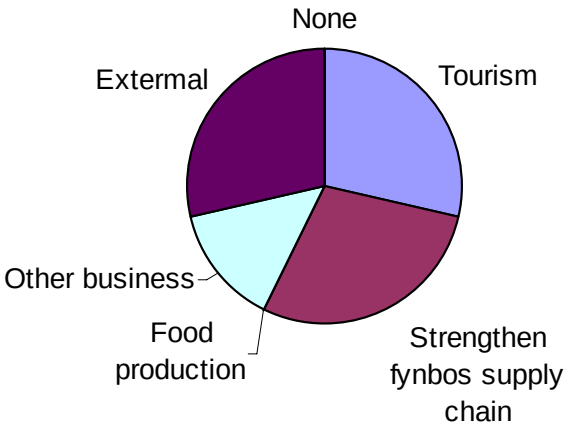
Under external opportunities, support is divided between those who see the government as source of salvation and those who do not. There is some contradiction between lifestylers identifying the government as a significant threat and this group's claim that external opportunities are the most important for the Strandveld. Clearly people do not like the government, but recognise it as an important source of resources.

Perhaps the most significant result in Figure 4 is that the farmers of the Strandveld see many different opportunities for their area. It is not unexpected that commercial farmers view food production as an opportunity, especially now that South Africa has become a net food importer, but it is surprising that so many commercial farmers view tourism or fynbos to be the best way to make a living. Commercial farmers who pursue food production alone might object to setting aside land for conservation, but they are in the minority, and therefore it is hard to understand why Curtis (2010) reports illegal ploughing to be rife in the Overberg. Illegal ploughing could be due to ignorance, but it could equally be considered to be an act of aggression against laws that are perceived to be unfair.

Commercial



Land barons



Lifestyle / conservation

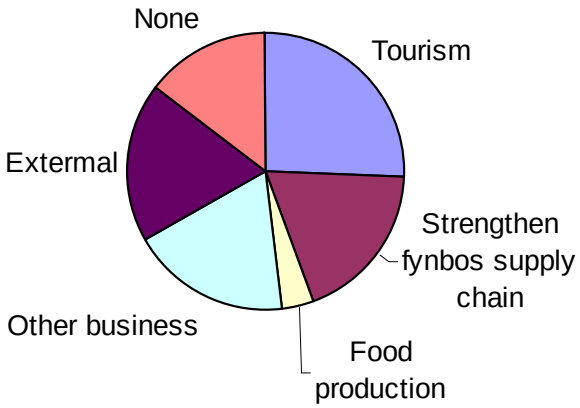


Figure 4: Main opportunities by farmer type (n = 70, multiple responses)

7. Perceptions of and participation in ABI

The ABI oversight committee's decision not to communicate could be responsible for the high proportion (40%) of landholders who indicated that they were unsure of ABI's purpose (Figure 5) and might also explain the low participation rate in ABI. The impact of not communicating is not just that people do not know the right story, but also that it makes them suspicious of what conservation has to hide, as the following quote illustrates:

> "I found out about ABI at the ESKOM meeting. [An ABI official] stood up to propose that the power line must run across my land rather than across ABI land. We live in the same community; there is no difference between ABI farmers and me!"

Unfortunately there is a history of communities not being informed about conservation plans. Apparently local farmers whose land was earmarked for the Agulhas National Park learnt from the newspaper about plans for the park. Some of the families had land expropriated when De Hoop Nature Reserve was established in 1956, and moved to the Agulhas Plain to start again. For them the main issue is not of monetary compensation made for expropriated land but the emotional upheaval that goes with relocating and the time it takes to develop a farm. Collectively these farmers see themselves to be the custodians of the land and the legitimate owners of it. They resent fortress conservation for locking them out from their rightful inheritance and denying that they have contributed to conservation. The extent to which ABI is identified with these values is the extent to which farmers will want nothing to do with the project. For conservation officials this might be a ludicrous position, since community involvement is exactly what landscape initiatives are about, but how can anyone outside conservation know this if they were not communicated with?

According to Lombard et al (2003) a strong vision is necessary to keep diverse stakeholders focussed. By not communicating, local landholders were left to develop their own disparate expectations of ABI, as the following quotes illustrate:

> "My dream is that ABI will change the way in which we live in this landscape. We must learn to value biodiversity for itself, and not just emphasise what we can take from nature."

> "ABI is good. They are all good people, but bureaucrats. They are simply not radical enough. We have to do it now [switch to

sustainable livelihoods]. And we will do it, whether they are on board or not."

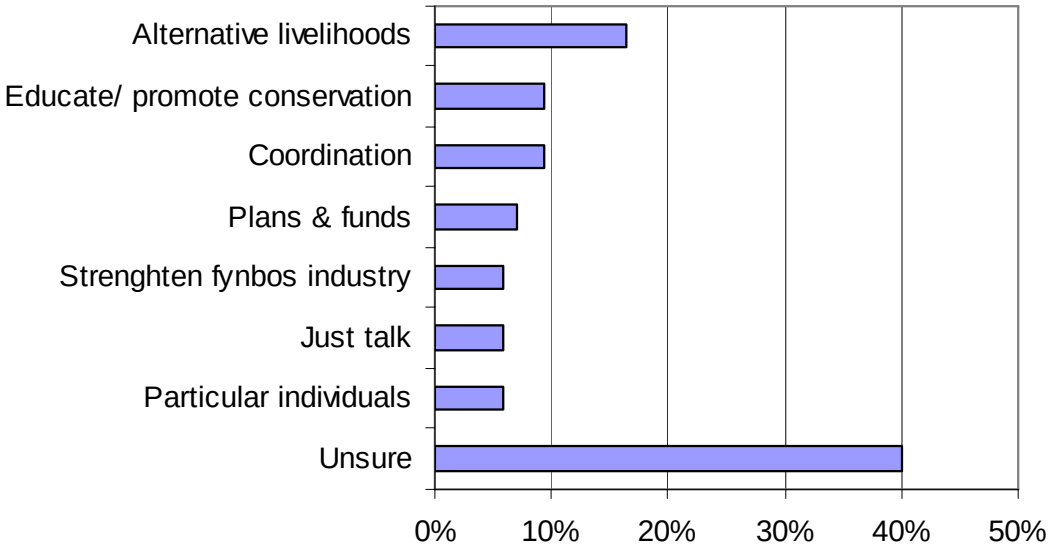


Figure 5: Farmers' views of ABI's role or purpose (n=79, multiple responses)

Failing to receive a clear message from the many meetings held in ABI's name, 6% of the respondents describe ABI as "just talk". A further 6% strongly identify ABI with members of the oversight committee. In many cases respondents were unable to distinguish between conservation organisations' work and identity and the work and identity of ABI. On the brighter side, 7% of landholders indicated that ABI's role is to develop and fund plans for conservation. A further 16% described ABI's purpose as that of finding alternative livelihoods for the people of the Strandveld, with 6% more indicated ABI to be responsible for strengthening the local wildflower industry. The function of environmental education was identified by 9% of the group, as was a coordination role for ABI. "ABI is the glue which keeps us all together and interested".

A quantitative model of participation in ABI

The binary decision to participate in conservation or not, y_i, is best modelled using a latent variable approach, where an unobservable propensity to be pro-conservation, y_i^*, is explained by a number of exogenous variables (Baum, 2006):

While y_i^* is unobservable, the outcome of the following decision rule can be observed

$$y_i = 0 \text{ if } y_i^* < 0$$

$$y_i = 1 \text{ if } y_i^* \geq 0$$

The decision rule applied to the latent variable model means that

$$\begin{aligned} \text{Prob}(y^* > 0 | x) &= \text{Prob}(u > -x\beta | x) \\ &= \text{Prob}(u < x\beta | x) \\ &= \text{Prob}(y = 1 | x) \\ &= \psi(y_i^*) \end{aligned}$$

where ψ(.) is the logistic cumulative distribution $prob(y = 1|x) = \frac{e^{x'\beta}}{1 + e^{x'\beta}}$

By assumption the error in the logit model is logistically distributed with variance $\frac{\pi^2}{3}$.

The dependent variable is an ABI participation rate. Of the 75 responses, 35% indicated that they participate in an ABI project. The participation rate is explained by the importance of commercial farming as a livelihood strategy, farm size, % of land cultivated, education level, knowledge of fynbos ecology and conservation attitudes.

The expected sign on farm income is negative because those who only make a living off the land have been shown elsewhere to be more negative towards conservation than those who do not live off the land (Shrestha & Alavalapati, 2006; Ma et al, 2009). Farm size is expected to be negatively correlated with participation since those with smaller farms have less to gain from ABI than those with larger farms. On average 46% of a farm's total area is cultivated, varying from zero to a hundred per cent. The expected sign on proportion cultivation is negative, on the argument that a landholder should be less interested in conservation if he has less scope for it. Furthermore, according to Richards et al (2005) farmers have a productivist ethic which causes them view themselves as tamers of the land. Therefore the extent to which land has been "tamed" will correlate negatively with participation in conservation projects. Education is expected to have a positive effect on participation as more educated people will be better able to understand the benefit of participation.

To construct the fynbos knowledge variable respondents were asked to rank a number of statements about fynbos ecology on a five-point Lickert scale (see Treurnicht forthcoming for detailed discussion). Values of four and five were combined to form the "agree" category in Table 10, and responses of one and

two were combined for the "disagree" category. With the exception of the statement that conservation is in conflict with wildflower harvesting, respondents generally agreed with the statements, while less than ten per cent of respondents gave neutral responses. Almost everyone (92%) feel that they contribute to conservation on the Agulhas Plain and consequently this statement was dropped from the index. The remaining index ranges from one (low levels of knowledge) to six (high levels of knowledge). Following Winter et al (2005), a positive relationship is expected between knowledge and participation. Of course the causality could go in either direction, but given that ABI had no communication strategy, the causality is assumed to run from knowledge to participation and not the other way.

Table 10: Survey response to ecological knowledge statements (n = 64)

	Frequency (%)		
Statement	**Agree**	**Disagree**	**Neutral**
Seed augmentation harms scarce species	56	25	19
Continued ploughing causes species loss	91	8	2
Ploughing promotes weedy species	70	19	11
Fire promotes weedy species	72	14	14
Conservation conflicts with wildflower harvesting	16	75	8
Fynbos diversity is important for business success	66	28	6
I contribute to conservation on the Agulhas Plain	92	3	5

Conservation attitudes were measured on a five-point Lickert scale with the statement "I have a good relationship with Land Care officials working in my area". Similar data exist on attitudes to South National Parks (on-reserve conservation) and Cape Nature (off-reserve) but were considered unsuitable proxies for prior conservation experience, because South African National Parks has been buying land aggressively in the area and Cape Nature is considered to have a particularly poor service delivery track record in the area. In contrast, the Department of Agriculture's Land Care has managed not to offend the community to the same extent. The Land Care variable was coded 1 = a good relationship and 0 = if not, including neutral responses. A third of the group indicated having a good relationship with Land Care.

Age, gender and home language as a proxy for culture, were dropped from the original model due to a lack of significance. Surprisingly neither

boerevereniging membership, nor involvement in private conservation was found to be significant determinants of participation in ABI. Unfortunately no data was collected on the succession status for each farm, which can expected to have a positive effect on planning horizon and therefore on the likelihood of becoming involved with conservation.

The results of the final model appear in Table 11. Two goodness-of-fit measures are reported. Baum (2006) points out that the likelihood ratio test, of which the null hypothesis is soundly rejected in this case, is not a demanding test, but the pseudo $R^2 = 0.4276$ indicates a reasonable fit for such a small sample size.

The coefficient on the share of income from agriculture is negative as expected and significant at better than 10%, thus confirming Richards et al's (2005) hypothesis. The marginal effect of a 1% increase in the share of income from farming from its mean value of 42% is 0.4%. This means that landholders with multiple income sources are more likely to participate in ABI than commercial farmers who rely only on traditional farm income. The coefficient on farm size is positive as expected and significant at better than 20%. The marginal effect of an increase in farm size is quite small, with a 1% increase in farm size only causing a 0.08% increase in the propensity to participate in ABI.

Table 11: Estimation results of a logit model for ABI participation

Variable	**Coefficient**	**SE**	**ME at mean**
% income from agriculture	-2.349**	1.266	-0.429
Log of farm size	0.442*	0.306	0.081
% of land cultivated	3.733***	1.765	0.682
Log of education	8.933***	3.235	1.632
Index of fynbos knowledge	0.797**	0.488	0.146
Attitude to conservation dummy	1.143*	0.831	0.225
Constant	-30.271***	9.438	
Goodness of fit measures			
Likelihood Ratio test $\chi^2(6)$	32.78	p = 0.0000	
Pearson $\chi^2(52)$	37	p = 0.9344	
Pseudo R^2	0.4267		
n = 60			

* significant at p≤ 20%, ** significant at p≤ 10%, *** significant at p≤ 5%

The coefficient on the proportion of land cultivated is positive and significant at better than 5%. The marginal effect of cultivation is almost double the marginal effect of share of income from agriculture. In this case a 1% increase in the proportion cultivated will lead to 0.7% increase in the propensity to participate, at the mean cultivation level of 46%. Although 14% of farms in the sample are more than 90% cultivated, the result does not support the notion that some landholdings are so intensively farmed that their owners have no further interest in conservation. Instead, the positive sign on cultivation suggest that those who farm more intensively, and thus less biodiversity left over for conservation, attach more value to conservation than those for whom untransformed land is abundant.

Education has a more than proportionate impact on involvement with conservation through ABI. The coefficient is positive and significant at better than 5% and the marginal effect shows that a 1% increase in education leads to a 1.6% increase in the likelihood of participating in ABI.

When it comes to the conservation variables, knowledge has a positive and significant (at better than 5%) relationship with ABI participation. A one unit increase in the index value measuring environmental knowledge from the average value of 3.7 to 4.7 will result in a 14.6% increase in the likelihood of begin involved with ABI. The attitude variable is also positive and is significant at better than 20%. A positive attitude to Land Care will increase the likelihood of participation by 23%. These results confirm two of the main findings in the literature, namely that better knowledge lead to better participation and that involvement with conservation can be explained by a prior good attitude to conservation (Winter et al, 2005, 2007). Moreover, with the attitude proxy used in this model, there is also some evidence for Ma et al's (2009) result according to which dissatisfaction leads to less participation.

Implications for conservation initiatives

The message for further conservation on the Agulhas Plain is simple: Firstly, take on board the importance of landholders' livelihoods in their conservation decisions. Consider compensation where conservation is in conflict with farming. It might very well be that no farming will be possible when the ecosystem collapses, but individual discount rates are at play here and they are much higher than those appropriate for society as a whole. Secondly, do not be surprised if offers of compensation are turned down, because identities are formed by ties to the land. Thirdly it might be tempting to focus exclusively on

the “low hanging fruits” of the land baron category, but conservation should not be limited to land barons only. Like society at large, individual farmers also attach more value to biodiversity when it becomes scarce than when it is abundant. Fourthly, history matters. In a local example Flower Valley Conservation Trust lost landholder trust over a misunderstanding around the way in which some of their early findings were communicated, and has had to work very hard over a number of years to regain that trust. On the other hand, some of the good extension work done by Heydenrych during the 1990s, when he was employed by Cape Nature, still survives in positive landholder attitudes. If prior experiences are positive, landholders are likely to remain involved, but once farmers are disillusioned, they are likely to withdraw from conservation projects despite the merits of a particular initiative. The Strandveld community is a stable long-established community where on average farm has been in a particular family for 67 years. A five year conservation initiative is but a blip that comes and goes, that could have no impact, but at worst could have a negative impact for many years to come. Finally, the danger of acknowledging only nature-based tourism and wildflower harvesting as legitimate conservation-compatible land uses at the expense of agriculture, might polarise the community into good and bad landowners. Such polarisation could harden into positions from which laws like NEMA will be boycotted and broken, for example by ploughing virgin land illegally.

8. Flower Valley’s experience as wildflower producer

In 1999, the farm Blomkloof was purchased by Fauna and Flora International’s Arcadia fund, to prevent its exceptional biodiversity from being turned into a wine farm. The land was transferred to Flower Valley Conservation Trust, an NGO working promoting conservation through sustainable wildflower harvesting. When Flower Valley was made responsible for ABI’s sustainable wildflower harvesting focus area, their land provided a good opportunity to test the business case for sustainable wildflower harvesting.

The trust has made excellent progress towards many of its objectives. Recommendations have been made to strengthen the Cape Nature permit system, a database has been developed and piloted to record what is being harvested in which quantities, best practice recommendations for wildflower harvesting have been developed and received the approval of the scientific community, and work is underway to monitor the long term impacts of wildflower harvesting on the environment as well as the livelihoods of the

community. The only respect in which the trust has failed to meet its objectives is in establishing a supplier base of certified fynbos producers. To date only seven suppliers have been recruited, trained and certified. There was some resistance from this group to expand certification as recruiting more certified producers in the face of limited market demand, since doing so would dilute the financial benefits of certification for those already signed up. Uncertified producers also object to certification as it implies their practices not to be sustainable. This section documents Flower Valley's financial experience as wildflower producer, describes its place in the market and reviews the community's response to the organisation, as an example of an ABI project.

The picking team's financial performance

In 2005 under new management it was decided to separate Flower Valley's farming business from the rest of the trust's activities in order to monitor the financial viability of wildflowers more carefully. At the same time the farm's pack shed was set up as an independent company, Fynsa, which purpose it is to develop a market for sustainably fynbos wildflowers. In February 2006 a wildfire swept through the area destroying the entire standing crop of wildflowers on Flower Valley's land. At that point the farm manager proposed for the picking team to become an independent contract harvesting operation, so as to test the viability this alternative business model for the industry. The picking team began exploring other outlets soon thereafter; in 2006 Fynsa still bought 87% of Flower Valley's crop, but by 2008 only half the crop was sold to Fynsa. The financial performance of the picking team, in Figure 6, is influenced by all these factors, but these figures still are some of the most reliable estimates available for wildflowers.

To measure real progress over this period, all nominal revenues and costs were inflated to constant 2008 values using an 'all items metropolitan areas' consumer price index from Statistics South Africa. In addition a number of strong assumptions needed to be made in order to extract the picking team's costs from the rest of Flower Valley's expenditure. The procedure was to allocate income statement items which obviously belonged to a particular enterprise to that enterprise and to distribute the remaining overhead costs to all enterprises according to each enterprise's share of gross revenue. Flower Valley's enterprises are the picking team, a rental activity and other, which include amongst others donations and the operation of the farm school.

For the wildflower enterprise allocated costs were built up from consignment data and picking records. Transport costs were based on standard per-kilometre rates of R5.09 per kilometre for 2006 and 2007 and R5.49 per kilometre for 2008 (Whitehead & Archer, 2008) and a reference distance between each picking site and the Fynsa pack shed. Given the importance of the other outlets, this was a simplification that was made on the assumption that other pack sheds are located no further away from the average picking site than Fynsa. Labour costs were based on the average actual labour productivity for 2008. In this year it took 72.04 man-days to harvest 10, 000 stems, which assuming the same labour productivity for 2006 and 2007, implies a total labour requirement of 336 and 577 man-days for 2006 and 2007 respectively. Estimated labour cost is the product the estimated labour requirement and the actual wage rate for each year. Stem fees were included at a rate of 33% of revenue on the entire crop in all three years. It is the customary share paid over to landowners in exchange for picking rights, and obviously it does not apply where one picks one's own land. The picking team operates a mixed system, picking its own land as it recovers in conjunction with rented land. It also picks some land for free in exchange for clearing it. To simplify, it was assumed that the picking team functions as a pure contract harvesting operation and pays stem fees on all product.

In 2006, wildflowers were assigned 44% of the unallocated costs of R192, 000. In 2007, wildflowers' share of overheads increased to 61% of R227, 000 and in 2008 it was 75% of the unallocated costs of R233, 000. Admittedly the estimates of overhead costs are a crude approximation for the overhead costs of a pure contract harvesting operation, but a landless picking operation would have to pay its owner a salary, which is not included in Flower Valley's overhead cost. In Flower Valley's case there is no debt on the land, as is consistent with a contract harvesting operation's position.

Figure 6 shows the picking team's income to be growing strongly from a small base. In real terms income doubled every year, from R151, 857 in 2006 to R287, 776 in 2007 and R641, 070 in 2008. In 2006 and 2007 the picking team was not strictly profitable, although it recorded a positive gross margin, which increased from 10% in 2006 to 20% in 2007. From 2006 to 2007 total gross margin increased fourfold from R14, 168 to R58, 642. In 2008, there was a further fourfold increase in gross margin to R232, 616. In this year the picking team recorded its first profit of R57, 679, which amounted to 9% of turnover.

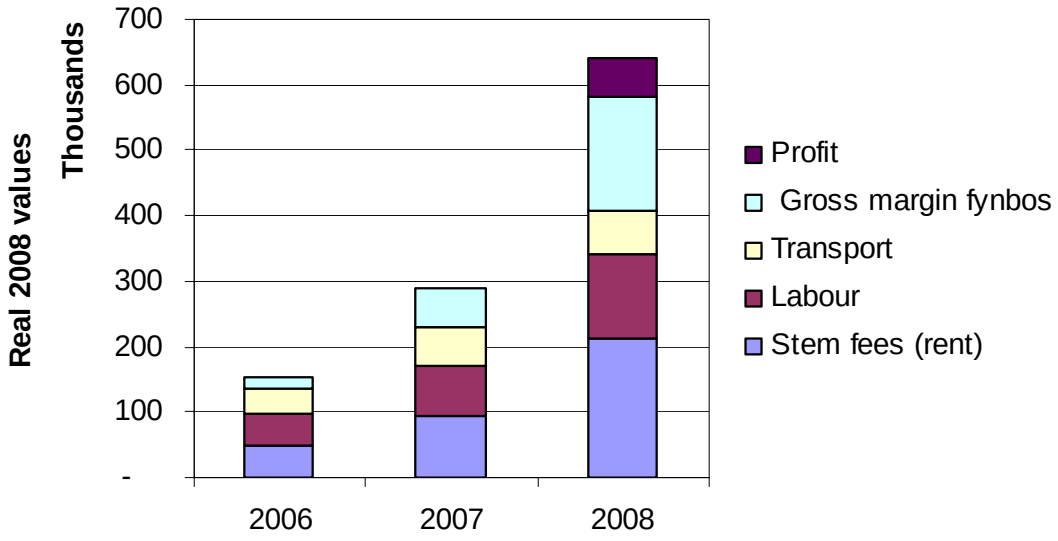


Figure 6: Revenue and profit growth for Flower Valley's picking team in constant 2008 Rand

As early as 2006 picking rights to almost 10, 000 hectares were secured, but most of this land was not harvested intensively due to a lack of demand. Fynsa is obliged to source at least 70% of its flowers from certified producers, including Flower Valley's picking team. Orders are issued on a daily basis by clients, and forwarded by the pack shed to one or more of its certified suppliers. It is not clear how Fynsa decides which supplier to issue an order to, although it is claimed that orders are matched with availability. Much of Flower Valley's picking team's growth over the period 2006 to 2008 can be attributed to finding additional markets.

Table 12: Profitability of wildflowers per R1, 000 of revenue

	2006	**2007**	**2008**
Stem fees (rent)	333	333	333
Labour	308	267	204
Transport	266	196	101
Total variable cost	909	796	637
Gross margin	93	204	363
Overhead cost	553	481	273
Profit	-459	-277	90

In the presence of strong growth it is difficult to compare total revenue and total costs across years. In agriculture, revenues and costs are often expressed per hectare, for easy comparison across crops. For wildflowers this is not a sensible approach, since wildflowers have a patchy distribution across the landscape and often occur on steep land of which the area is difficult to measure. Table 12 offers an alternative to gross margin per hectare estimates. It standardises costs per R1, 000 of revenue. Between 2006 and 2008 unit stem fees remained constant, by assumption. Unit labour costs declined by a third, from R308 to R204 per R1, 000 of revenue. Transport costs fell by almost 60%, from R266 to R101 per R1, 000 of revenue. The effect of these cost savings was for gross margin to increase from R93 to R363 per R1, 000 of revenue. In 2008 a profit of R90 per R1, 000 of revenue was recorded.

The effect of market conditions on a picking team's profitability

The picking team's profitability and growth possibilities are largely determined by its status as primary producer. For valid conservation reasons, it is restricted to wildflowers alone, and supplies mostly foliage products for the fresh market.

The fynbos industry makes a distinction between fresh and dried products, and in the fresh market between focal flowers and fillers (foliage). In each of the sub-industries there are a large number of standard products, including "straights" and mixed bouquets. Coetzee and Littlejohn (2001) describe the commercialisation of proteas. The first commercial cultivation took place at Protea Heights near Stellenbosch during the 1940s. During the 1960s the Department of Agriculture set up a breeding programme which was taken over by the Agricultural Research Council in 1995 and continues at Elsenburg near Stellenbosch. In terms of real value, industry output doubled during the 1990s (Middelmann et al, 1989 in Heydenrych, 2000; Coetzee & Middelmann, 1997). This is also the period when the proportion of fresh flowers sourced from cultivation increased from approximately 35% (Middelmann et al, 1989 in Heydenrych) to more than 80% (Wessels et al, 1997 in Coetzee & Littlejohn, 2001). Currently it is estimated that 75% of South Africa's protea crop is cultivated and that virtually all of the cultivation production is exported (University of Hawaii, 2008). A recent survey conducted amongst members of the Protea Producers Association of South Africa concurs, ascribing 92% of fynbos revenue to exports, and 67% of flowers and 58% of foliage to cultivation (Conradie & Knoesen, 2009).

The Department of Agriculture has no representative data on protea production, although it records the value of "flowers and bulbs" to have grown at 2.4% per year in real terms between 1993 and 2006 (Department of Agriculture, 2005 and 2010). The Department of Trade and Industry's (DTI) official trade statistics records "cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared" under the code 0603 and "foliage, branches and other parts of plants without flowers or flower buds and grasses, mosses and lichens being goods of a kind suitable for bouquets, or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared" under code 0604. The data for category 0603 and 0604 are given separately for fresh and dried products. In Figure 7 cut flowers combines fresh flowers and foliage while the category dried flowers includes both dried flowers as well as dried foliage.

According to the DTI data, fresh cut flower exports have grown at 2.8% per year in real terms between 1992 and 2010, with most of the growth recorded before 2002. The trend was sideways between 2002 and 2008, and since 2008 cut flower exports have declined at a rate of 11.4% per year due to the global economic recession. In the 2006/07 season cut flower exports consisted of 55% proteas, 40% traditional cut flowers (e.g. roses, chrysanthemums), 3% ferns, 1% orchids, and less than 1% grasses and reeds (PPECB, 2010). In the 2006/07 season the volume of ferns, grasses and reeds was already down by more than half compared to the 2004/05 season, while the volume of traditional cut flowers fell by two thirds during the 2007/08 season. Although there might have been adverse price effects, the volume of proteas exported has remained more or less constant at between 3,500 and 4,000 tons since 2003 (PPECB, 2007 & 2010). The picking team experienced neither price decreases nor declining volumes during the recession.

In contrast to fresh flowers, dried flower exports remained constant at between R80 and R100 million annually since 1992. Being dominated by fynbos wildflowers, this subsector gives a good indication of volume trends for wild fynbos. Importantly Figure 7 confirms that dried flowers, and by extension fynbos wildflowers did not share in the growth experienced by fresh fynbos during the 1990s.

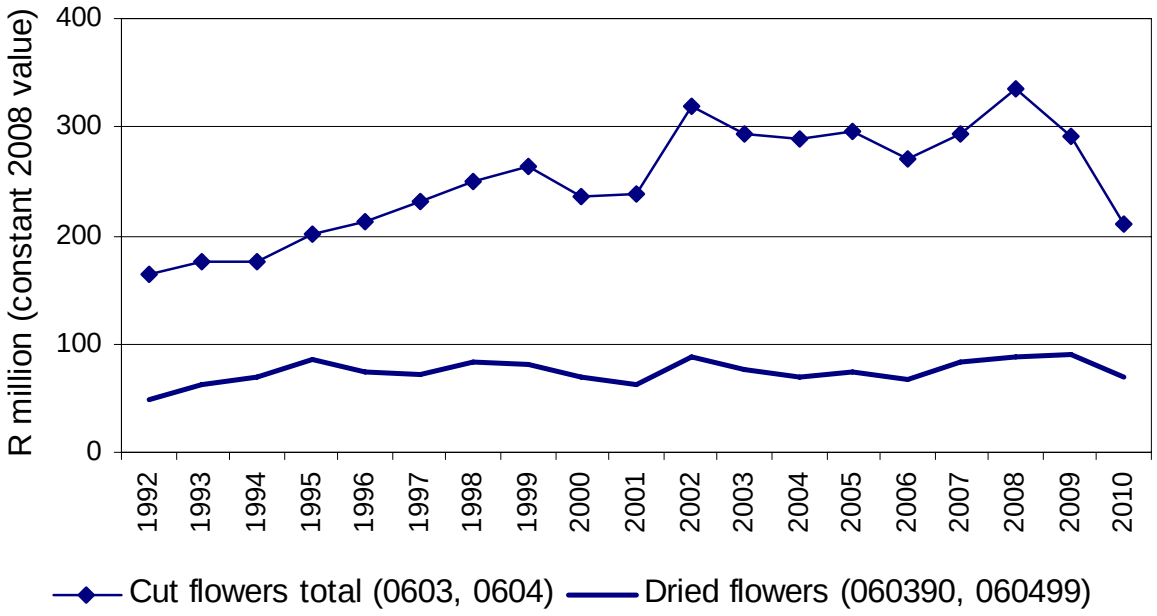


Figure 7: The real value of South Africa's total cut flower and dried flower exports, 1992 – 2010 (source: DTI trade statistics)

During the 2003/04 season the top ten proteas in terms of value consisted of five natural varieties and five cultivars (PPECB, 2007). *Protea magnifica* was the most important natural variety by quite a margin, while the hybrid varieties in order of value were Sylvia, Pink Ice, Cardinal, Susara and Brenda. According to the International Proteacea register (Department of Agriculture, 2000) Sylvia (*P. sussannae* x *P. eximia*), Brenda (*P. compacta* x *P. Burchellii*) and Cardinal (*P. eximia* x *P. sussannae*) are all chance hybrids selected in the Department of Agriculture breeding programme during the early 1970s, while Susara (*P. magnifica* x *P. sussannae*) was bred in the same programme in 1975. Pink Ice (*P. compacta* x P. sussannae) is an Australian cultivar (Reinten & Coetzee, 2001). As most other horticultural breeding programmes, the Department of Agriculture's programme selected for appearance, novelty, higher yields, better post harvest storage, increased pest resistance and a longer of different flowering season (Reinten & Coetzee, 2002). From a marketing point of view cultivated focal flowers is superior in every respect and thus commands higher prices. The only reason why *Protea magnifica* has not been hybridised yet is that it is extremely difficult to do; there is nothing inherently superior about *Protea magnifica* wildflowers which will protect it from being bred in future.

By choosing to restrict itself to wildflowers, the picking team restricts itself to the least lucrative sector of the fynbos market. The picking team harvests focal flowers when these are in season, but in 2008 only 12% of the picking team's consignments were of focal flowers and many of those were for the less

lucrative dried market. As a result the average price recorded for focal flowers was only R0.63 per stem (Table 13). Filler material pays far less. *Erica* varieties and other fillers fetch prices that are two thirds lower than the average price recorded for focal flowers, while cone bush products (*Leucadendron*) recorded an average price of 29 cents per stem. The high maximum price received on certain cone bush products indicate that some of these products were in fact focal flowers, although they were harvested from the wild.

Table 13: Wildflower producer prices recorded in 2008

Prices and consignments	**Focal flowers**	**Erica products**	**Cone bush products**	**Other fillers**
Average price (cent/stem)	63	21	29	24
Highest price	220	23	80	20
Lowest price	25	20	20	27
Consignments (number)	59	34	145	256
Annual price trend (06 – 08)	-17%	-6%	7.5%	-1%

The annual increase of 7.5% in the price of cone bush products is due to a change in the product mix towards more lucrative focal flowers, rather than a change in the prices of individual lines. Likewise, the sharp decline in the price of focal flowers over this period indicates a shift towards less lucrative dried material rather than a collapse in the price of fresh focal flowers. Given the low and stable prices for wildflowers, the picking team's strong revenue growth (Figure 6) is due to volume growth only. Some would argue volume-based wild harvesting not to be a sustainable business model, since industry growth would only be possible at the expense of a heavier impact on nature.

Finally, it is important to note that while Flower Valley prides itself on producing wildflowers exclusively, its market access and profitability still depend on the availability of cultivated focal flowers. The main benefit lies in cultivated flowers extending the period in the year over which filler products are demanded, but wildflowers also benefit from being sold together with more attractive cultivated flowers. I think the market evidence is compelling – cultivation is important driver of growth in the fynbos industry, and it is not likely to change in the near future. To make community-based conservation work, synergies must be created between wildflowers and conservation.

Landholders' relationship with Flower Valley

Farmers' resistance to Flower Valley is complex. However, the trust is most severely criticised for promoting the exclusive use of wildflowers. When asked directly, 92% of landholders indicated cultivation of fynbos to be important or very important, both because cultivation produces a higher quality product and because it is perceived to take the pressure of natural resources.

There is a similar struggle between farmers and ecologists on the related issue of seed augmentation, which is considered harmful by ecologists (Joubert et al, 2009). Teurnicht (forthcoming) recorded land management practices ranging from opportunistic broadcast sowing of local seed following a wildfire to complicated burn-plough-sow regimes, which quite frankly border on extensive cultivation. It is believed that these regimes improve the productivity of wildflower land and thus improve profitability. Farmers fail to understand the ecologists' concerns over species composition and long run land productivity:

> "The *fyn goedjies* (understory) appear of their own accord. There's lots of it; I must just manage the proteas and cone bushes."
>
> "Before I sowed in compacta this was a *haaivlak* (barren desert). At least now there are flowers to be picked."
>
> "When I bought this land the farm was geared to dried flowers. When the market turned, I converted all my *veld* (land) to produce for the fresh market. The market changed again and I am now switching back to products suitable for the dried market."

The last example is extreme, perhaps even by the farmer's own admission. My sense is that landholders are aware that some interventions are riskier than others, and would welcome ecological input into assessing their practices, provided that such input is non-judgemental of cultivation. I doubt if a blanket dismissal of seed augmentation will be paid any attention to in the long run. Monitoring and demonstration plots of various management options are likely to be taken more seriously by the industry.

The second complaint about Flower Valley involves the sustainability guidelines developed in conjunction with scientists and which are now being field tested by the pilot group of certified producers. The following views of the certification system are typical:

> "Those who survived [in the industry] know what they are doing. [Flower Valley's sustainable harvesting system] is nothing new. We have been using these principles for years. Their system is *uitverband geruk* (too extreme). Farmers are quite unhappy about how we were treated."
>
> "I attended the training workshops and I fully agree with the principles involved, but the system is not practical."
>
> "The certification system is too expensive and takes up too much time."
>
> "Flower Valley's system is difficult to manage. I cannot tell if the contract pickers have harvested a given area, so I can hardly tell if they did it right."

The so-called 50% rule is often quoted as an example of an impractical guideline. Research conducted into the effect of picking on seed banks of serotinous Proteas on the Agulhas Plain lead to the recommendation that 50% of the flowers must be left on each to protect the canopy-stored seed bank (Mustart & Cowling, 1992).

Farmers reject the recommendation as impossible, since the same fields are harvested multiple times a year and it is virtually impossible to tell a pruning wound made earlier in the same season from pruning wounds made in earlier years. Instead they recommend setting aside 50% of the land while harvesting the rest intensively. The danger of being caught by a wildfire with insufficient seed banks is recognised, but landholders feel that such a problem can be managed with seed augmentation. It is really unfortunate that farmers were not involved in developing the best practice recommendations, since their involvement would have guaranteed practical recommendations and would have strengthened the sustainable harvesting message. Farmers are more likely to pay attention to farmers than they are to *Engelse mense*, scientists, women and outsiders, all of whom are associated with the conservation message in one way or another.

Furthermore, failing to involve farmers is perceived as a silent accusation that all farmers follow unsustainable practices. Some productive wildflower land was indeed destroyed by overexploitation, but landholders feel that many examples can be given of farms which remain productive after many years of harvesting. Those managers are offended about not being acknowledged for conserving their land.

In the third place Flower Valley is accused of competing unfairly in a limited market and for a limited resource. I think that the picking team's impact is much smaller than it is believed to be, given that it fully utilises only about 10% of the area to which it holds picking rights. Nonetheless, I do think the community has a legitimate complaint and that the picking team should have been restricted to Flower Valley's land, or land of a similar size, only.

Table 14: Farmer perspectives on the fynbos flower market (n = 46)

Item	n	Yes	No	Unsure
Does the market care how fynbos is produced?	46	61%	35%	4%
If yes, what does it look for?	28			
Product quality		64%		
Sustainable harvesting		39%		
Chemical content		11%		
Social responsibility / fair trade		14%		
Interested in certification scheme	35	54%	37%	9%
Use FVCT's sustainable harvesting scheme	41	32%	44%	24%

Fourthly, certification is not believed to guarantee market access for wildflowers. In response to the question "Does the market care how fynbos is produced?" 61% of the sample said yes, 35% said no and 4% was unsure (Table 14). Two individuals distinguished between the end consumer, who in their opinion does not care, and supermarkets, which do care. Of those who said yes, 64% recognised the importance of product quality, 39% mentioned sustainable harvesting and a few each indicated chemical content or social responsibility to be required by the market. Surprisingly more than half of the group expressed interest in certification. If Flower Valley had managed to sign up all nineteen individuals who are interested in certification, it would be meeting its targets for establishing a sustainable supplier base.

Failing to do so raises the obvious question of why it has been so difficult to convince farmers of the benefits of certification. A part of the explanation lies in the community's doubts over Flower Valley's competence, which can be tied back to the business model promoted by the trust. The issue of scientific knowledge linked to the ability to enforce best practice guidelines, was raised more than once:

> "Flower Valley hasn't got a clue about what is really going on. Fynsa buys from people who rape the land and who don't have [picking] licenses in place. And so, Flower Valley destroys the *veld*."
>
> "Flower Valley is not able to police their sustainable harvesting. One needs a properly trained ecologist to assess if *veld* picked sustainably or not. Driving by in your *bakkie* (pick up) tells you nothing. The right people do not get out into the *veld* enough."

In all fairness Flower Valley cannot be held responsible for Fynsa's purchasing decisions, as Fynsa is an entirely independent company. Neither should an NGO be held responsible for enforcing government regulations or even for auditing a certification system. The importance of these quotes is that much more needs to be done to educate farmers about the functions of the various role players in the conservation sector. The fact that Flower Valley is charged with functions that do not belong to an NGO simply indicates that the organisation has done more than most to advance the cause of sustainable harvesting.

A final possible point of criticism of Flower Valley, incidentally not raised by landholders, concerns the nature of the labour arrangement with the picking team. The picking team was initially directed by the farm manager who has since been promoted to conservation manager, a position in which he no longer has day to day contact with the picking team. The picking team now works under the direction of a team leader who also acts as driver. All workers are employed full time at about a 20% premium to the statutory minimum wage which applies in the sector. When the statutory minimum wage came into effect in agriculture some farm work was outsourced to labour brokers, who have since been severely criticised for not guaranteeing the statutory basic conditions of employment. Given the permanent employment status and fixed salaries of Flower Valley's picking team, the picking team has little in common with labour broking, by promoting these independent labour teams Flower Valley could be perceived to promote labour broking as a labour saving device. This is no doubt not the intention with the picking team, as labour conditions are also monitored as part of the certification process, but the trust should be aware of the bad reputation of labour broking before recommending independent picking teams as solution to employment problems in the fynbos sector.

It remains to be seen if Flower Valley will be able to communicate itself out of the current poor relationship with its neighbours and intended beneficiaries. Aligning itself with PPSA and more closely with cultivation are good ideas, as is appointing one or two community leaders to the Flower Valley Conservation Trust's board. It will also be a good idea to have regular field days on Flower

Valley Farm as well as other farms as a platform to share information with the industry. The trust will also need to resolve the position of its contracting team and do more to spread market information and market access to more beneficiaries.

9. The wider impact of sustainable wildflowers

CAPE's integrated development vision strives for combined ecological, social and economic sustainability. The previous section established sustainable wildflower harvesting to be profitable, but profitability alone will not ensure that land use remains conservation-compatible or that conservation-compatible land use delivers significant benefits for the local community. This section addresses these questions in turn, after using the Flower Valley data to calculate the value of biodiversity in use.

The value of biodiversity in use

Due to the strained relations between conservation and landholders on the Plain, the value of biodiversity in use could not be estimated directly with the land use survey. More time and a greater extension effort might be able to change this in time, but in the meantime, an earlier estimate of the value of biodiversity in use can be confirmed. The 2009 survey's data on the composition of farm income reveal that the majority of the value of biodiversity in use still derives from wildflowers. Over the last ten years the share of income from wildflowers has remained stable, suggesting that Heydenrych's (1999) estimate might still apply. If so, the current value of wildflowers should be around R14.4 million per year. This figure is net of labour and transport costs and applies to landowners picking their own land. Alternatively Flower Valley's average wildflower revenue could be extrapolated to all fynbos land on the Agulhas Plain. It is not entirely appropriate to do so since the majority of the land to which the picking team had access was harvested part-time due to limited demand. However, the 10% which was utilised fully in 2008 provides a generalisable estimate of the current value of wildflowers. This site, which has highly productive acid sand proteoid fynbos (Lombard et al, 1997 in Heydenrych, 1999), yielded a gross margin of R165.23 per hectare net of stem fees, i.e. to an owner operator. Flower Valley does not own the site, but picks it in exchange for maintenance and restoration, effectively as if the land belongs to the trust. In contrast, Flower Valley's average gross margin was only R51.87 per hectare, as all other sites yielded only R19.23 per hectare.

Table 15: The value of the wildflower industry on the Agulhas Plain

	Industry net value (R million)		
Description	**Optimistic**	**Average**	**Conservative**
Flower Valley	11.8	9.7	4.6
Heydenrych (1999) in current value		14.4	

The average industry value in Table 15 is a weighted average based on land potential for wildflowers reported by Heydenrych's (1999). The Strandveld has 54% high potential wildflower land which was assumed to yield a gross margin of R165.23 per hectare, i.e. what the picking team achieved on high quality land with intensive harvesting. The 25% medium potential land was valued at Flower Valley's average gross margin of R51.89 per hectare and the 21% low potential land was valued at a gross margin of R19.23 per hectare. The resulting total industry value is R9.7 million per year, which is a third lower than the current value of Heydenrych's (1999) estimate. The optimistic estimate, which assumes all high and median potential land (71,411 ha) to yield a gross margin of R165.23 per hectare per year, produces an industry value of R11.8 million per year, while the conservative estimate applies Flower Valley's average gross margin of R51.89 per hectare to the whole industry for a total industry value of R4.6 million per year. The estimates in Table 15 apply to the current level of market access and the current supply of cultivated fynbos. Paradoxically, the value of biodiversity in use might increase as a result of more cultivation, which it was argued above, will be limited by irrigation water and NEMA regulations in any event. Additional concerns about gene contamination can be addressed by simply recommending that all flower heads of hybrid varieties be cut down at the end of the picking season or by maintaining a minimum safe distance between fynbos orchards and natural vegetation.

Are wildflowers profitable enough to bring about conservation?

Table 16 provides the answer to the question of the relative profitability of wildflowers. According to Tainton (1999), fynbos vegetation's year-round carrying capacity is 20 hectares per large stock unit (LSU), with 1LSU being equal to six sheep or one cow (Meissner, 1982). By these assumptions Overberg Agri's study circle's gross margin for sheep was R95 per hectare. These are representative estimates since all members of the study circle have a sheep enterprise and 40% of the group ran cattle in 2007. As is typical for the region,

livestock is kept on a combination of natural vegetation, planted pastures and crop stovers. In 2007, the study circle's beef cattle enterprise on average generated a gross margin of R1, 875 per large stock unit, which translates into a gross margin of R105 per hectare in constant 2008 Rand. More than 75% of the study circle members produced wheat in 2008 and almost two thirds of the group grew canola. The gross margin estimate for wheat assumes a wheat yield of 2.2 tons per hectare and the gross margin estimate for canola assumes a canola yield of 1.3 tons per hectare. Estimates include the cost of seed, pesticides and fertilisers, labour, machinery and fuel.

Permanent crops involve a large initial outlay which then generates an annual income stream for the duration of the productive life of the crop. Gross margin per hectare during the full-bearing phase is therefore an inadequate measure of relative profitability for permanent crops since the real question is whether the stream of positive gross margins during the productive life of crop justifies the initial outlay. Here a net present value was calculated assuming a 3% discount rate, and then annualised to calculate the equivalent of a gross margin.

Table 16: Relative profitability of land use alternatives for the Strandveld

Farm enterprise	Gross margin* R/ha	Key assumptions	Source
Wildflowers	165		2009 survey
	196		Heydenrych,1999
Wool sheep	95	20 ha/LSU	Study circle
Beef cattle	105	20 ha/LSU	
Wheat	1, 770	2.2 ton/ha	Study circle
Canola	1, 603	1.3 ton/ha	
High Gold pincushions	32, 910	cuttings	Department of
King protea (P. cynaroides)	31, 645	cuttings	Agriculture,
King protea	23, 233	seed	2001/2002
Safari Sunset	11, 377	cuttings	
Sauvignon blanc	4, 506	7.32 ton/ha	SAWIS, 2009
Cabernet sauvignon	-2, 232	7.32 ton/ha	

*Constant 2008 Rand, and annualised for permanent crops

Sauvignon Blanc and Cabernet Sauvignon serve as good estimates of the local profitability of wine grapes since each cultivar contributes about 40% of the area planted to white and red wine grapes respectively in the Western Cape's coastal wine region (SAWIS, 2009a). The average cost of wine grape production is R17, 826 per hectare and the expected yield is 7.32 tons per hectare in the coastal region (SAWIS, 2009b). In 2008 Cabernet Sauvignon recorded an average price of R3, 196 per ton and Sauvignon Blanc an average price of R4, 668 per ton. Between 2004 and 2008 vineyard replacement cost was R69, 955 per hectare on site plus R20, 404 in off-site infrastructure development, which gives a total establishment cost of R91, 995 per hectare. If wine grapes are assumed to come into bearing in Year 3 and have a productive life of twenty years, the annualised net present value for Sauvignon Blanc and Cabernet Sauvignon is R4, 506 and –R2, 232 per hectare respectively. This difference is solely due to the price of wine grapes and serves as a vivid reminder of the additional risk involved in producing permanent crops. As recently as 2002 the price of Cabernet Sauvignon was 1.6 times higher than the price of Sauvignon Blanc. Although prices will remain fickle, the profitability range recorded for wine grapes is likely to remain the same. Local wine farmers add value by providing tasting venues and other tourism facilities on the farms, but will not produce more than the absolute minimum of wine themselves at these levels of profitability.

The estimates for four types of cultivated fynbos were obtained from the Department of Agriculture's COMBUD series of enterprise budgets for 2001/02. High Gold, a pincushion selection, is assumed to have a productive life of eight years and produce its first half crop in Year 3. It is expected to generate a peak income of R104, 852 per hectare and incur a variable cost of R24, 507 per hectare. Establishment costs were reported to be R57, 988 per hectare. The weighted average price used in the COMBUD calculation is 96.3 cents per stem, which represents a 28% premium over the price received by the picking team for wild pincushions in 2008. These assumptions produce a net present value of R263, 277 per hectare over the life of the orchard, which converts into an annual value of R32, 910 per hectare. One hectare of *Protea cynaroides* propagated from cuttings is assumed to cost R88, 965 per hectare to establish and R26, 777 per hectare to grow when in full production. A 50% crop is assumed for Year 4 and the orchard is assumed to last for 18 years. In peak production, in Year 6 and 7, the orchard is assumed to produce 18, 135 stems per hectare for export and 4, 530 stems per hectare for the local market. Export quality flowers are assumed to bring R4.85 per stem and flowers for the local market to bring R3.42 per stem. The resulting net present value from *Protea cynaroides* propagated from cuttings is R569, 605 per hectare which is equivalent to an annualised value of R31, 645 per hectare. If *Protea cynaroides* is propagated from seed an

orchard costs slightly more to establish and takes one year longer to come into first production, but in peak production it yields 19% more flowers than an orchard established from cuttings. An orchard grown from seed is expected to generate a net present value of R418, 188 per hectare over its productive life, which implies an annualised gross margin of R23, 233 per hectare. A Safari Sunset orchard is assumed to cost R67, 371 per hectare to establish, come into bearing in Year 3 and have a productive life of eight years. In full production, variable cost is assumed to be R18, 071 per hectare and gross income to be R64, 013 per hectare. The enterprise budget assumes a conservative price of only 27.1 cents per stem, which explains Safari Sunset low profitability compared to other planted fynbos. Safari Sunset is expected to generate a net present value of R113, 773 per hectare over its productive line which implies an annualised gross margin of R11, 377 per hectare.

The price assumptions for cultivated fynbos might be somewhat optimistic for these particular varieties, since they are longer no longer novelties and prices drop sharply when easily-propagated varieties become commonplace. However, while the profit margins in Table 16 may not apply to Safari Sunset or High Gold any longer, they are an indication of what is possible if one has access to the newest cultivars, especially since cultivars increasingly carry plant breeders' rights and production quotas which keep prices high.

Table 16 reveals wildflowers to be less profitable than cultivated fynbos, wine grapes and even field crops. However, these are all capital intensive enterprises and therefore irrelevant for the decision to harvest wildflowers or not. Extensive grazing, which according to the study circle yields about R100 per hectare, is the only relevant alternative to wildflowers since it is the only enterprise which uses unimproved land. Even these are not perfect substitutes, since livestock needs to be moved to other pastures when the carrying capacity of natural vegetation declines. The size and viability of a livestock enterprise is therefore not primarily determined by the availability of fynbos land, but instead determined by factors such as the availability of irrigation and arable land.

Finally, despite being profitable not all wildflower land is picked. The owner of a relatively large livestock/grain business considers the stands of thatch reed in the wetlands on his farm to be part sideline and part opportunity for conservation. He harvests the thatch reed when prices are high, but stops as soon as the price falls below a certain (quite high) minimum, explaining that he enjoys the wetland more that the few cents harvesting thatch reed would bring.

Another farmer made a similar comment:

> "[Certified] flower pickers disturb wildlife. Nests fail. Small animals are scared off. I have stopped the harvesting my land; the little bit of money I get for the flowers does not compensate me for the harm the pickers do."

This section set out to ask if wildflowers as a land use option are attractive enough to ensure fynbos land to be conserved, and found that wildflowers are not particularly profitably but comparable to similar enterprises. The last two examples illustrate that financial incentives are not a prerequisite or a guaranteed for conservation on private land. However, in the presence of invasive alien vegetation, passive conservation is not enough, and the real question is if landholders are prepared to clear land without a financial incentive to do so. Some private restoration was encountered during the 2009 survey, usually on a small scale. In these cases wildflower revenues were never the reason for clearing. Clearing costs and labour availability on the farm on the other hand often determine the rate and extent of clearing. Farmers who clear alien vegetation because they think it is the right thing to do, usually cannot tell how much it costs them. This raises the question of whether the NEMA provision, in terms of which private landowners are held responsible for keeping their land clear of alien vegetation, is feasible even if the government were to assist with initial clearing.

Can wildflowers deliver significant benefits for the local community?

Given South Africa's high unemployment rate, one could argue real benefits for the local community to mean employment for unskilled people in this context. To assess the social impact of the wildflower industry, its job creation potential is compared to the number of jobs needed in Bredasdorp. Although immigration places an obvious limitation on the results presented here, the results must be thought of as a best-case scenario. If biodiversity-based business is unable to create sufficient jobs to significantly reduce poverty when assuming population to be fixed in a setting where a well developed wildflower industry already exists, the green economy is unlikely to make a difference in reality.

Two questions are investigated, namely how the demand for unskilled work compares to the supply of it, and how the wage paid in the wildflower industry compares with alternative livelihoods available in Bredasdorp. The data to do so

comes from a community survey conducted by Statistics South Africa in 2007 which reports amongst others employment status, personal income and the number of persons receiving various government grants. To this are added employment figures and wages from the most recent farm survey (StatSA, 2006), data on Flower Valley's employment and wages as example of what the wildflower industry can contribute, as well as information on the number of persons employed and wages paid in ecosystems restoration programmes in the Agulhas National Park (Coetzee, 2009).

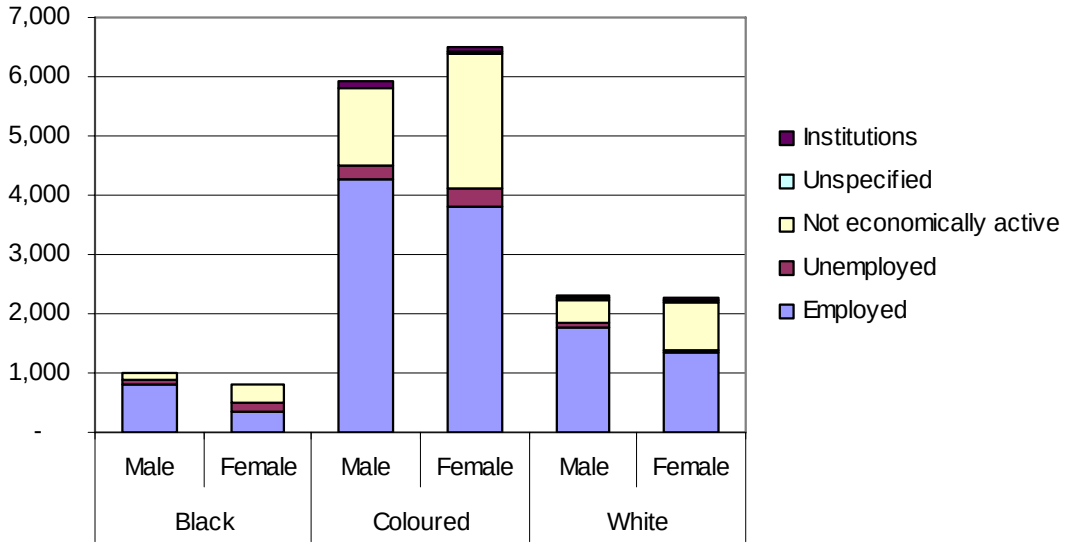


Figure 8: Employment status of Bredasdorp's working age (15 – 64) population (Source: Stats SA, 2007)

Regardless of race, the official unemployment rate in Bredasdorp is substantially lower than the national average. If one expands the employment definition to broad unemployment, that is, to working age persons who are not economically active, Bredasdorp's unemployment rate increases to 35% amongst blacks, 33% amongst coloureds and 29% amongst whites. Broad unemployment adds 5, 204 persons to the 899 officially unemployed individuals to bring the total number of jobs needed in Bredasdorp to 6, 103 (Figure 8). Of this total, 68% are coloured people and 42% are coloured women. Personal income data from the same source lead to a similar conclusion. A total of 5, 023 persons reported zero income, while 601 people reported a positive income of less than R4, 800 per year, and 2, 404 individuals reported earning between R4, 801 and R9, 600 per year (Table 17). The average income of the poorest third of the population is virtually zero irrespective of race. The average incomes reported by the middle third of the black and coloured population are quite similar to each other and are also similar to the value of the state old age pension. The average annual income

of the richest third of the black population is a mere R55, 221 per year, compared to the average annual income of R78, 501 reported by the richest third of the Coloured community.

Table 17: Income and income distribution in Bredasdorp (source: StatsSA, 2007)

Category	Black	Coloured	White
Average personal income in 2007			
Top third	55,221	78,501	247,063
Middle third	10,444	12,049	28,368
Bottom third		- 643	357
Working age persons per income bracket			
No income	608	3,195	1,220
R1 – R4,800 per year	64	529	8
R4,801 – R9,600 per year	156	1,443	204
R9,601 – R19,200 per year	452	3,025	450

Having established the number of jobs needed in Bredasdorp, the next question is at what wage these jobs will be taken up. This question could be approached from the principle of a poverty datum line, in which case dollar a day income of R3, 015 per year is an obvious candidate. Dollar a day income is in fact quite close to the value of the state child support grant of R2, 520 per year, which does function as a basic social safety net in South Africa. In 2007, the child support grant had 1, 511 beneficiaries in Bredasdorp.

Otherwise one could judge wages in the wildflower sector from the opportunity cost perspective. Table 18 presents the wages for a number of alternative livelihood strategies available locally. Regular farm work is the most lucrative of the unskilled occupations listed. The current value of the average regular wage recorded in the 2002 farm census is R29, 740 per year and the sector employs 1,053 persons in regular jobs, as well as 786 casual workers at a wage of R3, 503 per year. Farm employment in Bredasdorp has remained remarkably constant over the last fifty years, and is therefore unlikely to increase significantly from this level. The real wage of permanent workers grew at 2.15%

per year between 1952 and 2002, while the real casual wage fell at 2.75% per year over this period.

Table 18: Selected livelihood strategies in Bredasdorp

Livelihood strategy	Annual income*	Number of persons	Year
Regular farm work	29, 740	1, 053	2002
Full time wildflowers	19, 390	477	2008
Ecosystem restoration (200 days)	12, 000	19	2008 / 09
State old age pension	11, 280	1, 574	2008
Forster care grant	7, 800	31	2008
Ecosystem restoration (68 days)			
Agulhas National Park	4, 080	576	2008/09
Entire Agulhas Plain	4, 080	1, 366	2008/09
Casual farm work	3, 503	786	2002
Child support grant	2, 520	1, 511	2008

* In constant 2008 Rand

Ecosystem restoration is also a possibility for unskilled workers. Coetzee (2009) presents employment statistics for the ecosystem restoration work in the Agulhas National Park. Only 19 persons worked for more than 200 days during the 2008/09 season, i.e. approximately full time. At the standard wage of R60 per day, full time work in ecosystem restoration pays at least R12, 000 per year, but is difficult to find. One's chance of finding a part time restoration job is much better. The average work spell for ecosystem restoration projects based inside the Agulhas National Park is 68 days, which amounts to an annual wage of R4, 080 at the standard wage rate of R60 per day. Presumably some restoration is taking place outside the park as well.

For an optimistic estimate of the number of jobs in wildflower harvesting, Flower Valley's employment rate on its fully utilised site is extrapolated to the whole Agulhas Plain. In 2008 this site was picked on 129 days using nine full-time workers. The actual wages paid out to harvest the site was R90, 042, which implies an annual wage of R10, 005 per person per year for the time spent at that site. Assuming a working year of 250 days, full time harvesting therefore will

pay an annual wage of R19, 390, which is about two thirds of what can be earned in regular farm work. Another way to think about it is that this site employed one person for every 97 hectares for 52% of the work year, which means that one full time job can be created for every 197 hectares of untransformed fynbos, and that wildflowers could employ as many as 481 workers in the field alone. The general rule of thumb for the fruit industry is that packing fruit doubles the amount of labour needed to pick it, in which case the wildflower industry would employ as many as 962 fulltime workers, but even if this was the case, wildflowers would only reduce local unemployed by 16%.

Table 18 shows that the Agulhas Plain's wildflower industry can neither create the number of jobs needed to eliminate unemployment in Bredasdrop, nor pay particularly attractive wages to relieve poverty. If we are prepared to view the wildflower industry as a good supplementary source of income, however, rather than a primary occupation, the industry could make a bigger impact. If we were to share each of the estimated 481 full-time wildflower harvesting jobs between six people, it is possible to employ 2, 886 people which would each earn a wage of R3, 232 per year under current market conditions. If one includes pack shed jobs, and if in addition the market for certified wildflowers can be grown, wildflower harvesting could create all the jobs needed in Bredasdorp. Admittedly such part-time jobs would barely pay more than the child support grant for which no effort is required, but there are ways to combine seasonal work across agriculture which would bring as much as the state old age pension.

Table 19: An integrated biodiversity-based local employment plan

Description	**Number**	**Wage**	**Work spell**
Strict unemployment	899		
Jobs required (expanded)	6, 103		
Casual farm work (Elgin)	17, 472	3, 738	3 months
Part-time wildflower harvesting	2, 886	3, 232	2 months
Part-time ecosystem restoration	1, 366	4, 080	3.4 months
Total		11, 050	

The last farm census recorded 17, 472 part-time jobs in the Caledon district, which includes Elgin's apple farms. Labour demand in Elgin peaks sharply

during the apple thinning and picking seasons, and pays R3, 738 per year. The thinning season runs from late October to the middle of December and the picking season begins at the end of March and continues into May. Neither of these apple seasons conflicts with the wildflower harvesting season and apart from issues of training and mobility, there is no reason why workers cannot follow the seasonal work around. It should be obvious from Table 19 that ecosystem restoration would be an essential component of such integrated job creation plan. Presumably some ecosystems restoration work is taking place outside the Agulhas National Park as well as inside it. If ecosystems restoration is able to take place on the same scale outside the park as inside it, ecosystems restoration could generate up to 1,366 part time jobs that are each worth R4, 080 per year. Together casual work on fruit farms, part-time wildflower harvesting and part-time ecosystem restoration will be able to provide employment for about nine months of the year at a total wage of R11, 050, which is roughly the same as the average income reported by the middle third of the income distribution for black and coloured people in Bredasdorp.

Several things need to happen to make it a feasible plan, not least of which is the additional fundraising to create more jobs in ecosystem restoration in the short run. Creating the flexibility in the restoration programmes to expand and contract with seasonal demand will be another major challenge. The current heavy infestations of alien vegetation is a blessing in disguise insofar as it buys some time to improve market access for wildflowers and for the industry to develop synergies with cultivated fynbos. Cape Nature has an important role to play to protect the resource while at the same time enabling as much harvesting as far as possible, and perhaps finding the least harmful seed augmentation practice is a good way to go about the problem. The more value that is added locally the bigger are the potential benefit for the local community and therefore market development initiatives should continue to focus on the market for fynbos bouquets. Where at all possible the fruit industry must be encouraged to grow and thrive; it creates invaluable jobs and much local economic development without which is will be harder to make the economic case for conservation. Finally, it will be difficult to break into the fruit labour market from Bredasdorp. Various role players can contribute in this regard. For example, local government might be able to help with a seasonal public transport system, and even operating a farm labour bureau to increase the efficiency with which people can move from one job to the next. The Department of Labour in conjunction with the Department of Agriculture might be able to register socially responsible labour brokers for the fruit industry. Those responsible for training workers should consider training which equip workers for all these sectors.

These are just a few examples of what can be done if different role players work together the local community that they all profess to be serving. The first phase of ABI was remarkably successful at getting some of these conversations started. It is now up to people who share this trust to expand the partnership to other potential role players, in order to weave more people into the fabric of ABI's work as time goes by. I believe the plan is scalable to the entire Cape Floristic Region, since casual farm work is available within an hour's drive from about any point in the Western Cape. It is just a matter of being flexible, working together and keeping an eye on the overall goal, which is to keep as much of the remarkable wealth locked up in local biodiversity in this area.

10. Conclusions and the way forward with conservation on private land

This paper investigated why landholders on the Agulhas Plain resist community-based conservation efforts in their midst. Part A described the farmers of the Agulhas Plain as rich in biodiversity but poor in financial resources. Over the last decade the region was targeted with multi-level conservation projects, which despite a strong community-based conservation philosophy, failed to involve the local community. The off-reserve model was the only aspect of the landscape initiative which achieved significant participation, unfortunately because it is perceived to be an effective way to resist further land grabs by conservation as well as other forms of regulation.

Part B, which includes Section 4 to Section 7, tried to understand who the landholders of the Agulhas Plain are, and how their identity affects their participation in the landscape initiative. Section 4 introduced the land use survey and gave the descriptive statistics of the sample. The farmers of the Agulhas Plain are predominantly male, white and Afrikaans-speaking and the *boerevereniging* represents an important element of their social capital. In Section 5 landholders were clustered into three groups based on farm size and share of income from traditional agriculture. The three groups that emerged from the hierarchical clustering process have clearly different income strategies, but also different histories and levels of prior involvement in conservation. Section 6 established the hopes and fears of these different clusters to be different on a large number of topics. For example members of the commercial cluster are significantly more concerned about finances than the other two groups and see wine farming as a way out of their troubles. Lifestyle farmers, on the other hand, are concerned about government inefficiency and the invasive alien problem, but are much less worried about finances. They have mixed

feelings about most business opportunities, but consider Agulhas National Park to be a great opportunity for the area. The third group, land barons, are less concerned with finances and see opportunities in the park, carbon trading and game farming. Section 7 investigated the decision to participate in ABI, which achieved about a 35% participation rate. Results show participation to be a function of education, greater awareness of the importance of fynbos and positive prior experiences, but surprisingly it also showed that those who only have a little to conserve to be as eager to become involved as those who have a lot to conserve.

In Part C the focus moves from the farmers to a particular ABI programme. Section 8 showed sustainable wildflower harvesting to be profitable. It also recorded farmers as saying that it could be more profitable if combined with cultivated fynbos, something which Flower Valley initially did not consider at all. Farmers also complain about unfair competition from Flower Valley's picking team as well as not being involved in developing the sustainable harvesting best-practice guidelines. The analysis in Section 9 enquired about sustainable wildflower harvesting's ability to ensure conservation, and found that biodiversity is as often conserved simply because the farmer can afford not to use the land as it is through wildflower harvesting. Finally, Section 9 investigated the ability of the industry to create real benefits for the local community. Interpreted as jobs for unskilled people, wildflowers can make a much smaller impact than was expected, although it has better potential as supplementary income sources.

Was ABI a success? I think so, even if it was not a success from the landholder perspective. While it is essential for future conservation initiatives to understand what farmers think and what influences their decisions, it would be mistake to interpret ABI as a failure just because landholders did not respond well to the project. The real gains for conservation were not made in changing landholder behaviour. Instead, they were made in changing conservation behaviour to be more participative and more open to the idea that food production is as legitimate a consideration as biodiversity conservation. This was much harder and took much longer to achieve than anyone anticipated. When I became involved with ABI in the second half of 2008, just over a year before the end of the project, the core group of ABI partners were still struggling to find a shared agenda and modus operandi. This work continues. I think it is essential that ABI continues and that the hard lessons learnt are shared with other landscape initiatives.

Do farmers see merit in conservation? I think the majority does, although they may not necessarily accept that conservation represents no trade-off with production. In this respect the importance of a credible messenger should not be

underestimated. Conservancy experiences, and in particular the experience of the SMA, must be harnessed in farmer-to-farmer extension wherever possible. Trial plots, long term monitoring plots and other easily accessible examples of good conservation practice are worth a thousand extension agent words. All the biodiversity businesses suffer from a lack of basic financial data, which requires trust to build up. A way forward has to include the setting up enterprise-specific local study circles for wildflowers, tourism, game farming and perhaps charcoal, retrofitting renewable energy solutions to farm buildings and so on. An agricultural economist based in the area or a local agricultural or conservation extension agent with some knowledge of production economics will be well placed to steer these discussions. It is probably not a question of whether any of these businesses can work but rather a matter of how to adapt a particular technology for the local situation, and of collecting data that will convince the community. With ten to fifteen members and six or seven years of data one can begin to understand what drives successful conversion. Holding this data in a study group where farmers remain in control, may create the opportunity for more SMA-like groupings. But it is also important to disseminate the information and therefore any project funded through the landscape initiative should be required to release its financial results on an annual basis in order for the knowledge to be spread quickly beyond the early adopters.

Finally, the integrated development approach hangs strongly on the triple bottom-line promise, which makes it tempting to want to know local flows in the economy. This is an extremely ambitious question. The Treasury operates Social Accounting Matrix and Computable General Equilibrium models which model inter and intra sector flows in the economy. An experiment, which took place in the mid 1990s, showed that it was not feasible to build a community-level version of the same model, although such models might be possible at the provincial level. It is unlikely, however, that these models will be able to place ‘a value’ on the biodiversity of the Agulhas Plain. Economists rarely pursue a single value in any event; the discipline is more interested in issues of efficiency and questions of allocation. If there are particular groups that are of interest to policy makers, such as farm workers, annual household surveys typically suffice. I think a more difficult but more productive approach will be to concentrate on how communities want to distribute the benefits of biodiversity conservation.

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