CSIR Report No. ENV-S-C 2000-015

PROCEEDINGS:

BIOCONTROL OF ALIEN INVADING PLANTS IN SOUTH AFRICA - STRATEGY WORKSHOP -

January 2000

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BIOCONTROL OF ALIEN INVADING PLANTS IN SOUTH AFRICA
- STRATEGY WORKSHOP -

2 -3 DECEMBER 1999

STELLENBOSCH

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A workshop to pave the way for the development of a strategy for biological control of invading alien weeds in South Africa was held on 2 & 3 December 1999 in Stellenbosch. The workshop was attended by a wide range of stakeholders, including commercial growers of invading alien plants, conservation agencies, NGOs, and local and international scientists. The specific objectives of the workshop were to:

- establish **contact** between interest groups, as a precursor to ongoing dialogue and the development of partnerships,
- identify **issues of concern** to various parties and interest groups,
- identify **barriers** to achieving the aim of developing biocontrol to its full potential, and finding **solutions** to overcome these barriers, and to
- design of a set of **strategic actions**, and a **timeframe** for achieving these.

The workshop was successful in establishing contact between interest groups. Unfortunately, there was no representation from the Department of Environmental Affairs and Tourism, despite two delegates of this department confirming their attendance. In addition, the environmental lobby group was overlooked when planning the workshop. The workshop was quite successful in identifying the issues of concern. However, the absence of the Department of Environmental Affairs and Tourism, as well as the environmental lobby, means that all potential issues of concerns may not have been raised. Those taking the process further (developing the strategy) should liaise with these groups to ensure that their issues of concern are also taken into account. Some advances were made in identifying the barriers, the third objective of the workshop. Finding solutions to these barriers probably needs further examination. Some useful ideas were raised during the last session of the workshop when strategic actions were discussed. However, these ideas should now be taken further and incorporated into a plan which could be used as a basis for finalizing the strategy.

Due to time constraints the process of developing implementation time-lines, as well as short-term and longer term goals, and a process for developing the strategy could not be finalized. In this document a course of action is proposed for completing the process of developing the strategy. This course of action includes the following key steps:

1. The *Working for Water* programme commissions the task of developing a strategy.

2. The consultants compile a draft plan indicating the sequence of actions that need to take place, including the time-lines for achieving these. The draft plan is circulated to stakeholders for comment.

3. The revised plan is used as a basis for developing a strategic approach (a strategy) for using biological control as the principle means of dealing with the problem of invading plants.

It is further suggested that the process of developing the strategy, and the implementation thereof, should be driven by the *Working for Water* programme. The *Working for Water* Board, planned for institutionalisation sometime in the future, will ensure that there is collaboration among participating organizations and that appropriate funding mechanisms are in place.

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1. Background and Purpose

In recent years South Africa has been fortunate in being able to raise significant funding through the *Working for Water* programme for alien plant control, using a combination of economic arguments and strong political support. This has led to the establishment of over 200 Working for Water projects countrywide. Gaining control of the growing problem of invading alien plants is imperative in order to prevent enormous impacts. An integrated approach is required, where a range of methods are employed to deal with the problem. These include mechanical methods (felling, removing or burning invading alien plants); chemical methods (using environmentally safe herbicides); and biological control (using species-specific insects and diseases from the alien plant's country of origin). The *Working for Water* programme is placing special emphasis on integrated control and is investing in research on biological control. Historically, 103 biocontrol agents have been released in South Africa against 46 weed species, and only 10% have failed to establish. It is hoped to continue these successes, and the programme will be expanded to include weed species historically excluded from biocontrol research because of their commercial value.

The *Working for Water* programme aims to use biocontrol to its full potential, bringing as many weeds as possible under full or partial biocontrol, and to reduce the invasive potential of as many species with commercial value as possible, without affecting the ability to utilize them for commercial gain. The programme currently spends R5 million annually on biocontrol research, and has budgeted to increase this value. It is aimed to invest as much as necessary in biocontrol due to the high predicted returns on investment. The programme will also be investing in management capacity and infrastructure to ensure that the results of biocontrol research projects are implemented throughout South Africa. The workshop held on 2 & 3 December 1999 was seen as a first step in the development of a strategy for biological control of invading weeds. It is envisaged that it will ultimately lead to the implementation of equitable and acceptable biocontrol solutions to the problem of invading alien plants. The workshop brought together representatives of various interest groups to collectively work towards the development of an acceptable biocontrol strategy for South Africa.

A major aim was to work towards consensus in the manner in which biocontrol will be implemented, and in which collaborative governance can be achieved through the development of partnerships between government departments, NGOs and the private sector.

The specific objectives of the workshop were the following:

- The establishment of contact between interest groups, as a precursor to ongoing dialogue and the development of partnerships;
- The identification of issues of concern to various parties and interest groups;
- The identification of barriers to achieving the aim of developing biocontrol to its full potential, and finding solutions to overcome these barriers;
- The design of a set of strategic actions, and a timeframe for achieving these.

The workshop programme appears in Appendix 1, and the participants are listed in Appendix 2. Participants were selected to represent as full a range as possible of interest groups, including commercial growers, conservation agencies, government, NGOs, and local and international scientists.

2. Key Learning Points From Introductory Presentations

A number of speakers were invited to set the scene for the workshop through a series of presentations. These presentations focussed on the need for a biocontrol strategy, the magnitude of the problem of alien invading plants in South Africa, the present legislative framework, the concerns of commercial plant production sectors, the South African and international experience, as well as preliminary cost-benefit analyses of biocontrol programmes.

The key learning points from each of the presentations are summarised below:

Opening Address:	Deputy-Minister Joyce Mabudafhasi
Affiliation:	Ministry of Environmental Affairs and Tourism
Title:	Why do we need a Biocontrol Strategy?

Key Learning Points:

- A considerable proportion of South Africa's economy is based on invasive alien plants; i.e commercial forestry, firewood, building material, food, fodder, bee-keeping, and plants used for their aesthetic or utilitarian value.
- It is widely recognized that alien plants reduce water resources, replace indigenous vegetation, create fire hazards, degrade riparian areas, reduce land values, cause soil erosion, disrupt ecosystem processes and decrease the production potential of range-lands. This results in billions of Rands of lost revenue.
- Community based public works programmes, such as the *Working for Water* programme, have proved to be sustainable.
- Companies and individuals must be held responsible for any environmental problems arising from new plant introductions.

Speaker:	Dr François van der Heyden
Affiliation:	Division of Water, Environment, and Forestry Technology, CSIR
Title:	Alien Invading Plants in South Africa - Size of the problem, economic and environmental issues

Key Learning Points:

- Approximately 9 000 plant species have been introduced into South Africa, of which 1 000 have become naturalized. Approximately 160 of these have become really bad invaders. 10 million hectares of South Africa is invaded, which is equivalent to 8.28% of the surface area of South Africa.
- Invading alien plants reduce streamflow, degrade riparian zones, increase fuel loads and fire intensities, reduce biodiversity and results in the loss of potentially productive land.
- The increasing water demand in South Africa, coupled with the decrease in supply (due to invading alien plants), reduce economic growth potential.
- The *Working for Water* programme places special emphasis on biocontrol because it offers long-term solutions to many weed species.
- In situations where invading alien plants have economic benefits (commercial plant production), as well as negative environmental and economic impacts, conflicts of interest will arise. These conflicts will have to be dealt with in an extremely sensitive manner in order for South Africa to make progress in reducing the significant impacts of invading alien plants.

Speaker:	Mr M J Botha
Affiliation:	Directorate: Agricultural Land Resource Management, National Department of Agriculture
Title:	Addressing the Problem of Alien Invaders Through the Agricultural Resources Act: Successes and Shortcomings.

Key Learning Points:

- A major goal of the National Department of Agriculture (NDA) is to put in place policies and institutions to propagate sustainable resource use with the aim to conserve South Africa's agricultural natural resources. It is clear that these natural agricultural resources are a very scarce commodity and their protection is vital for the continued viability and productivity of the country's agriculture industry and are a major contributing factor towards attaining national food security.
- Alien plant invaders pose a constant threat, and NDA is constantly updating control policies and procedures.
- It is anticipated that the latest regulations that are presently being gazetted will strengthen the measures that can be used to control invading alien plants.

Speaker:	Mr Mike Walters
Affiliation:	Director: Plant Protection Research Institute, ARC
Title:	Implementing Biocontrol: Concerns of Commercial Plant Productions Sectors in South Africa

Key Learning Points:

- Statistics have shown that biocontrol is the safest method of weed control, and that it is target-specific, self-spreading and permanent.
- Future plant species introductions should not be compromised by biocontrol unless there are exceptional reasons.
- An array of scientific protocols are followed in South Africa to ensure that biocontrol programmes are effective and do not have untoward effects on non-target organisms.
- Approval for release procedures of biocontrol agents critically examine the possibilities of detrimental effects on the environment, biological diversity and the production of agricultural and forestry products.
- Consultative procedures are implemented to ensure that commercial interests are involved in planning such programmes, and that their concerns are addressed.

Speaker:	Dr Jim Cullen
Affiliation:	Chief: CSIRO Entomology, Australia
Title:	Biocontrol of Invasive Alien Plants: The Australian Experience

Key Learning Points:

- Successful biocontrol programmes can take many years. It is a long-term investment.
- In some cases "delicate" negotiations are needed to persuade the public that the introduction of a biocontrol agent will be beneficial.
- There is great value in undertaking detailed cost-benefit analyses to illustrate the return on investment.
- Environmentally friendly, community friendly, and economically defensible biological control is a basic building block for sustainability in the future. This forms the basis for the current biological and integrated approach to weed management in Australia at the present time.

Speaker:	Dr Ernest Delfosse
Affiliation:	National Programme Leader for Weed Science, Department of Agriculture, United States of America
Title:	Trends in Resolving Conflicts of Interest in Biological Weed Control - Lessons for South Africa

Key Learning Points:

- Regulatory challenges remain the main obstacle to more widespread research and technology transfer in biological control.
- Enabling legislation, including global/regional harmonization of regulations, for biological control should be passed to empower regulators to become entrepreneurial facilitators and customers to provide a scientific peer review of the process.
- This legislation should establish a single point of contact for regulating biological control, often the more experienced quarantine-regulatory group.
- Biological control is not a panacea, but is a safe, proven strategy that should form the basis of integrated weed management programs.
- In order to develop an effective plan to implement a national biological control programme, a philosophy should firstly be agreed upon, a policy developed, and only then can actions be formulated.
- "Insanity" was defined as "continuing to do something the same way, and expecting a different outcome." This is an important message for land managers in South Africa dealing with the invading alien plant problem..
- International partnerships should continue to be developed and expanded to make better use of scarce resources, foreign biological control laboratories, and commonality of target species.
- Scientists should continue to lead the way in objectively identifying where biological control can be used.
- The challenges to South African scientists and regulators are to; examine regulatory philosophy, authority, regulations and policy; to clarify and negotiate responsibilities; to document the current system; to consult widely with customers; and to propose a mechanism for continued, meaningful customer involvement.

Speaker:	Dr Jeff Waage
Affiliation:	Biological Pest Management, CABI Bioscience, United Kingdom
Title:	Sharing Biodiversities, Facilities and Expertise for Improved Biological Control of Alien Plant Invaders

Key Learning Points:

- Biological control is widely accepted in the environmental community as a valuable tool in sustainable management of alien weeds.
- Regulatory and safety issues are presently being addressed at the national and international level.
- Inter-departmental co-operation is essential.
- South Africa has more technical capacity in biological control of alien invasive species than any other country in Africa.
- Africa, north of South Africa, has more experience in implementation of biological control at the national and regional level than any other continent.
- Co-operation with other African countries has therefore many potential benefits for South Africa.

Speaker:	Dr H G Zimmerman
Affiliation:	Manager: Weeds Research Division, ARC – Plant Protection Research Institute
Title:	History, Present Trends and Prospects of Biological Weed Control in South Africa

Key Learning Points:

- The uncertainty of adequate research funds for long-term biocontrol research projects is probably the major stumbling block for weed biocontrol in South Africa. More reliance will have to be placed on donor contributions and participation in international projects.
- Cost-benefit and risk-benefit studies will become increasingly important in new biocontrol research projects.
- The nature of present-day biocontrol research demands that more research will have to be undertaken in the country of origin (of the weed species), and greater cooperation with research institutions in these countries will therefore be required.
- It is most likely that biological weed control will be increasingly subjected to international protocols, agreements and new environmental regulations. South Africa is already guided by the FAO international code of conduct on the importation of exotic biocontrol agents.
- Biological control remains the best and often only tool available to solve the problems of invading alien plants. It makes long-term economic sense to invest in capacity to deal with these problems in a country (and a continent) that is custodian to one of the world's richest biodiversities.

Speaker:	Dr David Le Maitre
Affiliation:	Division of Water, Environment, and Forestry Technology, CSIR
Title:	Cost Benefits of Biocontrol Programmes of Invasive Plants in South Africa

Key Learning Points:

- There are huge potential returns on investment from biological control. More studies are needed to illustrate the extent of these savings.
- The overall costs of alien plant invaders include direct control costs (R 260 million/year), opportunity costs for water (> R 1 400 million/year), damage to river systems and lost productivity which are difficult to quantify due to the lack of data.
- The question of how much of these costs could be saved by using effective biocontrol measures remains unanswered. However, a preliminary investigation suggests that for every R 1 (Rand) that was spent on biocontrol of *Sesbania punicea*, R 563 was saved on what would have been spent on control costs. Similarly, R 806 was saved on control costs of *Acacia saligna*, and R 84 for *Acacia longifolia* on a Rand saved (on control costs) per Rand spent (on biocontrol) basis.

3. Record of the Workshop

Facilitator:
Ms Janet Love
Ministry of Water Affairs and Forestry

3.1 Condensing the Range of Issues

Following the presentations (refer to section 2) the facilitator summarised the most important points raised by the various speakers, and also introduced some issues that could be dealt with during the subsequent phases of the workshop.

- It appears that there is unanimous support for using biocontrol.
- It was stressed (by the Deputy-Minister) that companies and individuals must be held responsible for new alien plant introductions. However, we have to start looking at were joint responsibility lies.
- There are not enough safety and regulatory measures in place.
- We need a better understanding of how cost-benefit analyses can be used as a way to convince others of the benefits of biocontrol.
- We should move to a point of consensus, which is some cases may be a delicate process.
- A substantial component of South Africa's economy is based on alien invading plants. However, the South African population may be affected negatively because of these industries, in the form of impacts such as the loss of water and productive agricultural land.
- Cooperation should take place between government departments, including parastatals in dealing with this issue. However, these institutions are notorious for not working together.
- We need to define (more tangibly) the issue of community representation.

This was followed by an open discussion at which time numerous additional points and issues were raised that were summarised by the facilitator as follows:

- Biocontrol may not necessarily be as widely accepted as is assumed by the majority of scientists.
- Control systems of bringing plants into SA needs scrutinizing and possibly reinforcement. There needs to be accountability.
- Risk-benefit analysis needs to ensure that concerns with regard to biodiversity are taken into account through EIAs. The science of resource economics is still in its infancy.
- Trust is critical in an area that depends strongly on scientific evidence. Political expediency is a major problem.
- Redirecting economic activity and the question of compensation

- Scientific data needs credibility - for example the basis for data collection and analysis, and peer review, should be defined.
- Define and ensure responsible management
- Review the current prioritization of the biocontrol research agenda with stakeholder inclusion in the decision-making process.
- GMO technology may also be a management tool but constraints in terms of international standards are preventing its use - South African compliance regarding GMOs.
- Legislative and regulatory gaps, including shortcomings with regard to phytosanitary controls.
- Cost-benefit analysis must identify who should bear which costs.
- Regulations gazetted for comment based on the "new ethic" that biocontrol can be used in a way that does not impact on "demarcated areas".
- Smuggling plant material can be a problem.
- There should be consultation and transparency about what is being done, and what is accepted as fact.
- Sustainability of funding for biocontrol is essential to ensure that interventions are both timeous and effective (includes human capacity).
- Is biocontrol the most cost effective mechanism for invasive controlling the spread of invading alien plants?
- We need to separate out the different issues relating to biocontrol, by categorising alien invading species into those with commercial value, no commercial value but impacting on biodiversity, and those with cultural significance (other benefits).

The facilitator suggested that the above points and issues represent five major themes, and that these could form the focus for discussion during the rest of the workshop. Workshop participants supported this suggestion.

Five themes identified for further discussion:

™ Science
™ Stakeholders
™ Legislation, Regulation and Controls
™ Resources
™ Cost-Benefit and Risk Benefit Analysis

At the conclusion of the open discussion a revised vision, outlined below, was

agreed upon:

Vision:

"To optimise the use of biological control as one of the components of an integrated programme to curtail the negative impact of invasive alien species in a way that is acceptable to most stakeholders."

3.2 Barriers to Achieving Vision

During this phase of the workshop the participants were divided into three groups, with each group tasked with listing the barriers and constraints to achieving the vision, specifically with respect to the 5 themes identified during session 1. The barriers and constraints listed by each group are listed in Appendix 3. Following the report back by individual groups, and open discussion, the facilitator summarised the barriers and constraints identified by all three groups as follows:

Science

1. Quality, credibility and need for peer review
2. Prior interaction with stakeholders to ensure meaningful design
3. Need to have pest management perspective
4. Contingency planning necessary
5. Lack of consensus about priorities
6. Impact assessments necessary
7. With "problematic" biocontrol agents, long term predictions may be difficult
8. Trainers and trainees in short supply to reinforce existing researchers
9. Representivity in the field is lacking
10. Far more needs to be done to promote credibility of activity
11. Science is not seen to be sufficiently objective by the public
12. Greater transparency needed
13. Improved technology transfer is necessary
14. Need for consistent multi-disciplinary assessment prior to, and after release of agents.
15. Sustainable resources are essential
16. Too much expected of scientists. Who is responsible for what?

Stakeholders

1. Lack of consultation and positive involvement
2. Need conflict resolution mechanisms
3. Biocontrol protocol needs stakeholder involvement
4. Lack of stakeholder commitment

5. Lack of responsibility and accountability
6. Who are the stakeholders?
7. Need for improved strategic planning which involves stakeholders
8. Poor communication
9. Need to accept responsibility
10. Ensure that "polluter pays" approach is accepted
11. Failure to enforce and implement legislation
12. Resource poor stakeholders are not actively involved
13. Improved involvement of SADC and Africa needs consideration
14. Consultation mechanism should be created
15. Identify who is responsible for emerging weeds
16. Education about biocontrol is necessary

Resources

1. Public image of biocontrol inhibits its ability to attract resources
2. Resource allocation not driven by stakeholders
3. Lack of information about biocontrol resources
4. Flexibility to change research directions when required (budgetary implications)
5. Lack of sustainable adequate resources, especially human capacity
6. Need to ensure that decisions about resources include trade-off issues, and are able to evaluate the returns on investment
7. Research is not easily marketable and there needs to be a long-term strategy to achieve this.
9. Alternative funding (not only *Working for Water* programme) needed.

Legislation

1. Need to monitor control bodies
2. Legislation must limit the symptoms and the introduction of species - pro-active regulation
3. Problems of getting permission to release biocontrol agents
4. Forestry Stewardship Council with its restrictions, or opposition to biocontrol
5. Failure to enforce and implement legislation
6. Narrow line function thinking
7. Trade barrier issues must be taken into account
8. More needs to be done to publicize legislation
9. Legislation needs to be improved, and loopholes closed
10. Protocols must be implemented
11. Deadlock breaking mechanism are required

Risk benefit

1) Predictability of biocontrol with regard to impacts is low; safety has been a major focus

2) Uncertainty of future target plant species
3) There is a perception of associated risks with biocontrol agents. However, this perception does not exist when importing plants.
4) Lack of stakeholder involvement in risk-benefit analysis before and after research
5) All costs elements need to be defined and methodology agreed upon. "Soft issues" that are difficult to quantify are often excluded from resource economics accounting exercises.
6) Cost of weeds must be evaluated in a transparent manner.

3.3 Strategic Directions and Actions

During this session each group reported on the barriers and contradictions identified, which was followed by open discussion. It was agreed that it would be impractical to deal with each individual barrier identified. It was further resolved to focus on a selected group of barriers that can effectively be used to shape strategy. The barriers that were collectively identified for the development of strategic directions and actions are listed below. During the workshop "barriers" were in many cases worded to denote strategies or actions. We have taken the liberty of re-phrasing these original statements to reflect actual "barriers" or "contradictions".

- Uncertainty of the scientific research needs, and the predictability of results from biocontrol research
- Lack of representivity in the number of trainers and trainees
- Poor technology transfer
- Legislative barriers
- Lack of an accepted set of baseline data pertaining to the cost of weeds
- Low credibility of biocontrol as a scientific discipline
- Lack of mechanisms to consult stakeholders
- Resource poor stakeholders are not represented
- Stakeholders are poorly informed of legislative framework
- Lack of conflict-resolution mechanisms
- Inadequate marketing of research, particularly given the long-term nature of biocontrol research
- Lack of a system to implement the "polluter pays" principle
- Trade barriers are not adequately considered.
- Lack of alternative funding sources
- Resource allocation is not stakeholder-driven
- Lack of methods to undertake cost-benefit analyses which also recognize future issues.

The three groups were tasked with the development of strategic directions and actions to overcome the barriers listed above, with each group dealing with a

separate set of barriers. The outputs from these individual group discussions are outlined in Appendix 4.

Each group developed action-cards denoting which actions needed to take place to overcome the barriers and contradictions identified earlier during the workshop. Following the report back by each group these action-cards were placed on an adhesive sheet showing the time-line, covering the period from year 2000 to 2003. It was found that all cards were clustered in years 2000 and 2001, suggesting a sense of urgency.

4. Driving the Process

The question of the institution or committee responsible for driving the process of biocontrol strategy development and implementation was debated during the concluding session of the workshop. The participants agreed on the model shown in Figure 1. With this model there will be a *Working for Water* Board which will provide overall strategic direction to the programme. This Board is not yet in existence. It is anticipated that the Board will be constituted by Ministers from the range of government departments shown in Figure 1, with the Department of Water Affairs and Forestry acting as lead agency. The Minister of Water Affairs and Forestry will most likely act as chairperson. The Board will ensure commitment at the highest political level. There will also be a steering committee with wider representation, which will provide an advisory function. This committee will have representation from a wider range of stakeholders, including industry, NGOs, and conservation bodies. This steering committee, in turn, will have a number of sub-committees, focussing on specialised areas such as legislation, socio-economic issues, funding and education. It was suggested that there should also be a sub-committee on biocontrol, with advisory functions. This sub-committee will be constituted by representatives from stakeholder groups shown in Figure 1.

The *Working for Water* programme will be responsible for driving the process of biocontrol strategy development and implementation, and will be advised by the biocontrol subcommittee. The programme is in a position to fulfil this role by virtue of its access to funds, its proven track record, and its commitment. In the event of the *Working for Water* Board not being established, the biocontrol sub-committee may become a committee of the existing *Working for Water* programme structure.

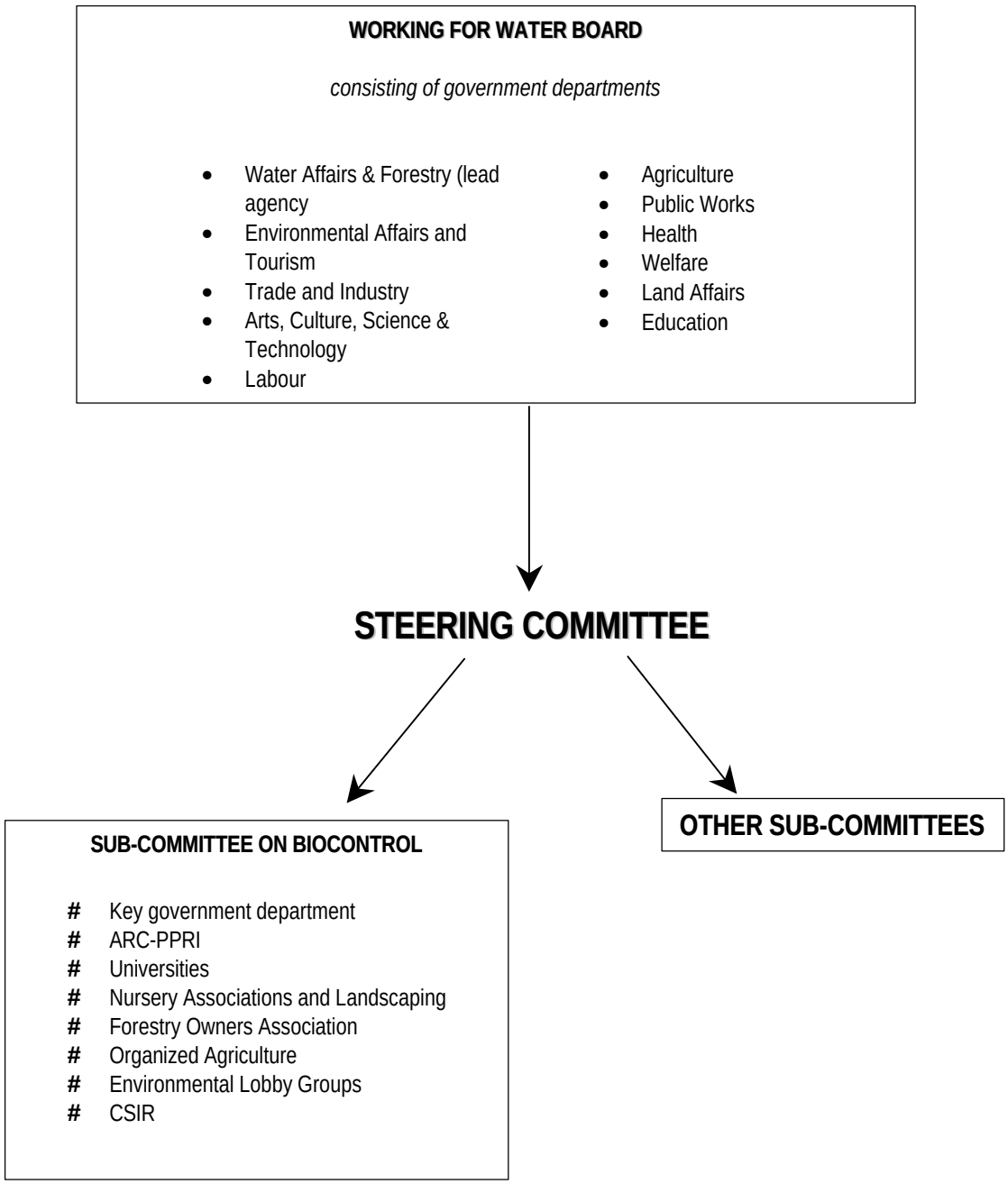

Figure 1 : Organization structure showing the relationship between the proposed Working for Water Board and the sub-committee on biocontrol. This sub-committee will advise the Working for Water Programme.

5. Future Steps towards developing Strategy

During the workshop the process of developing implementation time-lines for strategic actions (refer to section 3.3) could not be concluded due to time constraints. The suggested actions could therefore not be critically evaluated in terms of feasibility. Neither was there an opportunity to identify overlaps in actions, or to describe pre-requisite processes or structures that need to be in place before actions can be initiated. Moreover, many of the actions listed in Appendix 4 are "processes" with no measurable end-points (*e.g.* encourage present research activities). In short, the workshop objective of developing implementation time-lines, as well as short-term and longer term goals could therefore not be finalized. This step in the strategy development process needs to be concluded, and it is suggested that this task be commissioned by the *Working for Water* programme. The group tasked with this should critically evaluate the actions identified by the groups, selecting those that have measurable endpoints (convert processes to actions), and those that are meaningful with respect to the development of the strategy. The group should also identify pre-requisite actions that may have been overlooked when strategic actions were developed during group discussions, and including these in the final list of actions. A draft plan indicating the sequence of actions that need to take place, including the time-lines for achieving these should then be compiled, preferably using planning tools based on the Theory of Constraints. The draft plan should then be circulated to stakeholders for comment, including new stakeholders such as the environmental lobby which was not represented at the workshop. After incorporating stakeholder comments, the final plan should be submitted to the *Working for Water* programme.

The final plan should be used as basis for developing a strategic approach (a strategy), and to secure funding, for dealing with the problem of invading plants, using biological control measures. This process of developing the biocontrol strategy should not be undertaken in isolation. It should be nested within the national weed strategy, which is planned to be developed during the year 2000.

6. Concluding Discussion

During the concluding session of the workshop two pertinent issues were discussed. These issues are summarised below because they provide valuable pointers of how we should proceed in our efforts of biocontrol strategy development and implementation.

- There is no doubt considerable political will for dealing with the problems of invading alien plants in South Africa. Once there is political will, policy development should follow, and finally action. During the workshop we have made some advances in listing the actions required, specifically for intensifying the use of biocontrol measures. However, a policy has not yet been agreed upon. A start will most probably be made with policy development at the South Africa/United States of America Binational meeting on Invasive Alien Species, to be held in February 2000.

- During this workshop there was a tendency to focus on those invading alien species that also have commercial value. Implementing biocontrol measures on these species are quite complex because of the conflicts of interest. We recognize that in the medium term we will need to develop an understanding of how to deal with these problem plant species. However, there are a host of invading alien species that do not have commercial value. Our immediate efforts in terms of biocontrol research and implementation should focus on these species. At the same time we should carry on in our efforts to collectively address the issue of using biocontrol measures on commercially valuable species.

Appendix 1:

Workshop Programme

BIOCONTROL OF ALIEN INVADING PLANTS IN SOUTH AFRICA
- STRATEGY WORKSHOP -

***Date*: 2 - 3 December 1999** **_Venue_: CSIR, Stellenbosch**

Day 1: Thursday, 2 December 1999

Time	Activity	*Leader*
08h00 - 08h30	REGISTRATION - TEA & COFFEE	
	Chairperson	*Dr Brian van Wilgen*
08h30 - 08h45	Why do we need a biocontrol strategy?	*Deputy MinisterJoyce Mabudafhasi*
08h45 - 09h00	Alien invading plants in South Africa - Size of the problem, economic and environmental issues	*Dr Francois van der Heyden CSIR*
09h00 - 09h15	Addressing the problem of alien plant invaders through the National Environmental Management Act and International Conventions	*Dr Steve Tiba Dept. Environmental Affairs & Tourism*
09h15 - 09h30	Addressing the problem of alien invaders through the Agricultural Resources Act: successes and shortcomings.	*Mr T. BothaNational Dept. Agriculture*
09h30 - 09h45	Implementing biocontrol: Concerns of commercial plant production sectors in South Africa	*Mr Mike Walters PPRI - ARC*
09h45 - 10h15	MORNING TEA	
	Chairperson	*Dr Steve Tiba*
10h15 - 10h40	Biocontrol of invasive alien plants: The Australian experience	*Dr Jim Cullen CSIRO, Australia*
10h40 - 11h05	Trends in resolving conflicts of interest in biological weed control - lessons for South Africa	*Dr Ernest Delfosse USDA, United States*
11h05 - 11h30	Sharing biodiversities, facilities and expertise for improved biological control of alien plant invaders	*Dr Jeff Waage CAB International*
11h30 - 11h55	Trends and prospects of biological control of alien invasive plants in South Africa	*Dr Helmuth Zimmerman PPRI - ARC*
11h55 - 12h20	Cost benefit of biocontrol programmes of invasive alien plants in South Africa	*Dr David le Maitre CSIR*
12h20 - 12h45	Open Discussion	
12h45 - 13h45	LUNCH	
13h45 - 14h00	Setting the scene: Programme for development of the strategy	*Facilitator: Ms Janet Love Ministry of Water Affairs and Forestry*
14h00 - 15h30	Session 1: Practical vision building	
15h30 - 16h00	TEA	
16h00 - 17h00	Session 2: Analysing underlying contradictions and barriers to achieving the vision	
17h00	CLOSE OF DAY 1	

Day 2: Friday, 3 December 1999

Time	**Activity**	***Leader***
08h30 - 08h45	Setting the scene: Day 2 program	*Facilitator : Ms Janet Love* *Ministry of Water Affairs & Forestry*
08h45 - 10h45	Session 3: Development of strategic directions	
10h45 - 11h15	TEA	
11h15 - 13h00	Session 4: Designing the strategic actions	
13h00 - 14h00	LUNCH	
14h00 - 16h30	Implementations timelines: short- and long-term goals. Where to from here? - Individual responsibilities and contributions	
16h30	CLOSE	

Appendix 2:

List of Participants

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Appendix 3:

Record of Group Discussions - Session 2
Barriers & Constraints

Discussion Topic: Barriers and Constraints to Achieving the Vision, Specifically with Respect to the 5 Themes Identified During Session 1

GROUP 1:

Science

- It is the responsibility of scientists and biocontrol researchers to present their results to the stakeholders
- Decisions should be based on sound scientific vs. political decisions
- Scientific evidence to be reviewed by peers
- Need to identify technical constraints
- There is a lack of consensus on the priority list of weeds and agents
- Need to look at impact assessment.
- To improve quality, credibility and peer review, need to:
  - ™ Design meaningful experiments, involving stakeholders, at initiation of research
  - ™ Agree on the list of specificity tests(
  - ™ Consider Biocontrol not as the sole component of IPM
  - ™ Include habitat restoration considerations
  - ™ Predict the outcomes of releases of new agents
  - ™ Improve contingency plans

Stakeholder involvement

- There is a lack of consultation and involvement with the stakeholders
- There is a lack of a conflict resolution process.
- Protocol should involve all stakeholders
- Lack of commitment of all stakeholders
- Need technical representation in marginalised agriculture => affirmative action required
- Resolution of the polluter pays principle with identification of public responsibility.
- Need to identify stakeholders.

Legislation, Regulation and Controls

- Control board required to regulate the introduction of new species, to save on control costs in the future.
- There is a lack of proactive planning (i.e. treating symptoms not the causes)
- Difficulty in getting permission to release new Biocontrol agents, the interdepartmental mechanism is cumbersome.
- FSC barrier to biocontrol

Resources Finances and People

- Public image of biocontrol inhibits ability to attract resources
- Allocation of resources not driven by stakeholders
- Money is needed for research (there is a lack of information on the resources required to achieve objectives)
- Who should we tap for funding?
- Budgeting flexibility required.
- There is a shortage in the number of trained people for Biocontrol work and lack of capacity (caused by resource limitations).

Risk-benefits and Timing

- Predictability: researchers find it too difficult to predict the outcomes of Biocontrol.
- Risk assessment analysis can't be done if the outcomes of research cannot be predicted.
- Uncertainty of future agents is a concern to stakeholders.
- There is a perception of associated risk of Biocontrol (plants are OK but not pests and pathogens)
- Lack of stakeholder involvement with the development of Cost- benefit analysis
- What are the current costs of weeds?
- Need to define the cost elements and methodology for defining potential risk.

GROUP 2:

Produced 11 general barriers:

Lack of acceptance and Recognition of science

- Credibility of science
- Lack of formal international recognition
- Lack of trust amongst the stakeholders

Lack of scientific skills and resources

- Lack of current capacity and expertise
- Difficulty in getting skills and training
- Lack of recognised experts
- Lack of transformation (representivity)

Lack of science validation

- Unknown long-term implications of Biocontrol
- Lack of post release evaluation of Biocontrol agents
- Poor multi disciplinary assessments before research is commenced
- Benefits of Biocontrol are difficult to quantify
- Difficulty of predicting research outcomes
- Insufficient data available.

Difficult biocontrol agents to work with:
Identification of stakeholders

- Problems in identification of Stakeholders
- Inclusion of SADC stakeholders and others
- Exclusion of Resource poor farmers and community
- Individual vs. collective perspectives
- Lack of accountability
- Deliberate sabotage by vested interests
- Stakeholder participation may be used as a delaying tactic
- Preparation of "sweetheart" reports

Poor communication

- Biocontrol phobia in the community/ stakeholders

- Stakeholder consultation is difficult
- Lack of understanding of the science by many stakeholders
- Integration of research into implementation (Technology transfer)
- Insufficient emphasis on promoting successes of Biocontrol
- Lack of communication to potential sponsors
- Lack of awareness of legislation

Lack of funding and resources at all stages of Biocontrol

- Time/ Resource constraints
- Trying to be too sophisticated
- Need cooperation between scientists (Local & international) to promote credibility for funding
- Lack of infrastructure
- Lack of government focus and priorities
- Unsustainable long term funding

Lack of strategic planning

- Lack of priorities in allocation of resources
- Exclusion of specific stakeholders
- Trade off in integrated resource management
- Lack of priorities in allocation of resources
- Narrow line function thinking

Ineffective/ inappropriate legislation

- Legislation bottlenecks and holdups
- Inter-governmental collaboration
- Outdated and inappropriate legislation
- Lack of a clear “one stop shop” root
- Loopholes in legislation
- Lack of dispute resolution procedures
- Inability to fast track urgent legislation

Lack of responsibility and accounting

- Difficulty of addressing conflicting viewpoints
- Vested interests
- Who should pay and who should benefit
- Acceptance of responsibility of alien problems
- Lack of user B pay/ polluter pay approach
- Lack on consensus on issues
- Failure to implement and enforce legislation

Risk assessment Barriers

- Lack of agreement on what is meant by “risk”
- Subjective assessments of risk
- No agreement on methodology
- Need techniques that include “soft issues”

Group 3 continues on next page…

GROUP 3:

Science

- Sustainable Resources
- Research capacity
- Work in adventive's range
- Prioritisation

Stakeholders

- Need for stakeholder Forum
- Identify stakeholders
- Who supports emerging weeds?
- Resolving conflicts of interest
- Lack of understanding of the potential of biocontrol
- Unrealistic expectations of Biocontrol

Resources

- Lack of sustainability
- Need for long-term strategy
- Lack of international funding for regional projects
- Alternative funding resources

Cost Benefit analysis

- Lack of capacity/ expertise in this field
- Need for peer review/ transparency

Appendix 4:

Record of Group Discussions - Session 3
Strategic Directions and Actions identified for Each Barrier

Discussion Topic: Strategic Directions and Actions Identified for Each Barrier – Session 3

Barrier:
Uncertainty of the scientific research needs, and the predictability of results from biocontrol research

Strategies:

- Continue with the science related to safety and non target effects.
- Extend the science in order to increase our understanding of weeds species, and to improve the predictability and effectiveness of biocontrol programmes.

Actions:

- Increase the involvement of plant ecologists and economists in weed biocontrol research through funding opportunities and cross sectoral meetings
- Ensure that research projects include plant ecological (distribution, rate of spread) and economic components
- Convince clients and stakeholders that existing research, as well as additional research on plant ecology and eonomics need to be supported.
- Involve stakeholders in the formulation of research
- Develop the science of forecasting weed problems.
- Develop protocols and methods for post-release monitoring and evaluation in non target organisms.

Barrier:
Lack of representivity in the number of trainers and trainees

Strategy:

- To increase and develop capacity in the biocontrol of alien invading plants

Actions:

- Develop structures for research collaboration and interaction. This can be achieved by developing a centre of excellence, possibly at a University, with strong links with other research institutions. This centre of excellence should encompass the following elements:
  - ™ graduate and post-graduate training for trainers and trainees
  - ™ mentoring of these students within specialized research institutions and within universities
  - ™ exchange programmes between universities and other research institutions, including international exchange
  - ™ internships of students at centre of Excellence, particularly those students from historically disadvantaged universities
  - ™ increase accessibility of funding from government funding structures such as NRF and THRIP
  - ™ increase capacity at universities
- Embark on corrective action measures
- Encourage present research activities
- Obtain additional funding from stakeholders, industry and through partnerships
- Retain existing capacity

Barrier:
Poor technology transfer

Strategy:
- To disseminate biocontrol information to the target group, including decision makers, stakeholders, general public, and rural communities

Actions:
- Explain the role of biocontrol, including the positive and potential negative impacts
- Justify the need for biocontrol
- Publicize the extent of the alien weed problem in SA, and the suite of associated impacts
- Identify target audience and appropriate vehicles for transfer of information
- Identify barriers to effective communication
- Reduce gaps between science and popular media
- Establish who should communicate and disseminate the information (scientist or specialist communicator)
- Create capacity and mechanisms to inform target groups
- Identify resources needed for effective communication

Barrier:
Legislative Barriers

Preamble:
Importation and release of biocontrol agents is covered by 2 acts relating to agriculture, and 1 act relating to the environment. There are additional 9 provincial Nature conservation acts relating to plant introductions. There is a need to evaluate these acts to facilitate effective implementation of biocontrol control measures.

Strategy:
- Audit and review legislation and regulations to streamline procedures.
- Increase stakeholder involvement in the importation & release protocols for biocontrol agents.

Actions:
- Document current legislation and regulations
- Identify current roles and responsibilities of various authorities
- Identify gaps and overlaps, including the possible need for new legislation
- Negotiate within government for the establishment of a single lead agency
- Publish agreement reached (a document) for public comment, along with protocols and standards
- Finalise and distribute to stakeholders the final document
- Develop a conflict resolution process.

Barrier:
Lack of an accepted set of baseline data pertaining to the cost of weeds

Strategy & Actions:

- Develop a database that will include the following:

Biology of Invading Alien Plants

- ™ Extent of current invasion
- ™ Rate of invasion
- ™ Determine geographic invasive potential

Biology of each agent

- ™ Quantify impact on Invading alien plants target species
- ™ Estimate cost of potential control measures needed to control agent
- ™ Other impact on success of agents (chemicals from agric., fires etc)

Alien Plants and with Commercial or Utilitarian Value

- ™ Evaluate potential impacts of biocontrol agents on existing commercial industries
- ™ Evaluate benefits of industries based invading alien plants
- ™ Compare cost of biocontrol in comparison to other methods (chemical & mechanical)

Environmental Impacts of Invading Alien Plants

- ™ Disruption of ecosystem functioning, and associated provision of services
- ™ Impacts of other methods of control of invading alien plants on human and animal health
- ™ Health impacts of invading alien plants

Barrier:
Low credibility of biocontrol as a scientific discipline

Strategy:

- Ensure stakeholder involvement from the start of the programme
- Ensure impartiality of the science

Actions:

- Client to disseminate plans and objectives of programme for comment by stakeholders
- Establish a steering committee to resolve conflict
- Negotiate majority buy-in by stakeholders
- Make use of accredited scientists
- Insist on national and international peer review

Barrier:
Lack of mechanisms to consult stakeholders

Strategy:
- Identify the stakeholders

Actions:
- Clients to identify the stakeholders before the commencement of work on new target species
- Optimise use the media, public participation and known relevant organizations

Barrier:
Resource poor stakeholders are not represented

Strategy:
- Ensure the involvement of resource poor agriculture

Actions:
- Find out who represents resource poor agriculture through liaison with parliamentary bodies, cultural leaders, and community leaders
- Develop and provide relevant educational materials and opportunities
- Organise targeted workshops
- Organise sponsors for the programme

Barrier:
Stakeholders are poorly informed of legislative framework

Strategy:
- Communicate legislation to stakeholders

Actions:
- Form an interdepartmental government agency to take responsibility for communicating legislation
- Summarize legislation so that it is easy to understand and in language of choice. Related legislation to be presented as part of this summary.

Barrier:
Lack of conflict-resolution mechanisms

Strategy:
- Establish a consensus process and ensure that there it includes a conflict resolution mechanism.

Actions:
- Biocontrol community to review consensus and conflict resolution processes in other countries
- Adapt foreign processes to South African situation

Barrier:
Inadequate marketing of research, particularly given the long-term nature of biocontrol research

Strategy:
- Ensure that research is marketed (emphasizing its long term nature) in order to secure sustainable and adequate resources.

Actions:
- Implement a national promotional campaign to advertise biocontrol
- Document how long projects take and publicize this information
- Promote a research investment ethos through cost benefit analysis
- Present realistic long term research plans with discrete stages to funding agencies.

Barrier:
Lack of a system to implement the Apolluter pays @ principle

Strategy:
- Determine steps to be taken to protect public goods and ensure that polluter pays

Actions:
- Identify polluters
- Resolve the issue of allocation to private vs public good.
- Establish what should be paid for impact and control costs

Barrier:
Trade barriers are not adequately considered

Strategy:
- Ensure that trade barriers are considered

Actions:
- Ensure stakeholder participation prior to introduction

Barrier:
Lack of alternative funding sources

Strategy:
- Identify alternative funding sources.

Actions:
- Identify and dialogue with stakeholders
- Investigate equitable ways of sharing costs through land tax, funds from industry and from government.
- Develop a National Weeds Strategy

Barrier:
Resource allocation is not stakeholder driven

The group did not discuss the strategies and actions for this barrier separately, since it was felt that there is a great deal of overlap with the strategy and actions identified to overcome the barrier relating to funding sources (refer to previous barrier)

Barrier:
Lack of methods to undertake cost-benefit analyses which also recognize future issues

Strategy:
- Develop defendable cost-benefit analysis tools which consider future costs

Actions:
- Identify all cost elements and the methods of cost/ benefit analysis which also recognizes future issues
- Embark on multi-disciplinary projects with greater emphasis on resource economy tools
- Subject all cost-benefit studies to peer review.