Team Operations – A Preliminary Environmental Impact Assessment Scoping Exercise

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Improving Pesticide Application Techniques for Desert Locust Control

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TEAM OPERATIONS - A PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT SCOPING EXERCISE

Project Activity D.1.2.2
Analysis of Current Practices

INTRODUCTION

This technical note considers some of the areas of potential adverse environmental impact, other than those of large-scale pesticide application, arising from operations to locate and control desert locust. Although the large-scale use of pesticides in such operations has been considered, for example in studies by Locustox, there has been no systematic review of the environmental impacts of the other activities of survey and control teams in desert areas. This technical note, produced under GCP/INT/651/NOR - Analysis of Current Practices, is an attempt to identify those adverse environmental impacts of non-pesticide use which may be significant. Small and isolated actions may cause adverse individual environmental impacts in an environment which is largely remote and only marginally affected by modern life and the cumulative nature of these actions may be extremely significant in such fragile environments. This note, therefore, concentrates on aspects that may be too small to be normally considered under the terms of reference of a formal environmental impact assessment.

Survey and control operations by the CLAA are not the only human activity in the desert. Mineral excavation is also important and the number of tourists is growing. The sorts of impacts caused by these visitors are likely to be similar to those of the CLAA teams.

The CLAA has actively encouraged this study in order to examine ways of reducing any adverse environmental impact caused by their operations and also to develop a best practice model which could be used by other public and private sector organisations.

This preliminary review has shown that there are a number of areas where environmental impact could be reduced either through changes in team practices or by the application of alternative existing technological solutions. Further work is required to determine whether the impacts noted are individually significant and also to predict the level of significance of cumulative impacts. The secondary impact of team operations on the global environment, for example the use of diesel, also needs further investigation.

METHODS

The aim of an environmental assessment scoping exercise is to identify a preliminary range of issues that should be investigated so that the potential environmental impacts arising from any activity can be assessed. This range of issues may be amended during the assessment process.

This technical note has been produced following both discussion and review of currently available published data and, secondly, by visits to survey and control teams under operational conditions in December 1999 and January 2000 and updated following further field visits in April, September and October 2000. During field visits current practices were observed and

the opportunity was also taken to talk to team members at various professional levels to gain as wide an understanding as possible of the potential impact of different activities. Discussions were held in an unstructured format with the intention that the team members themselves would highlight the points they felt important. Experience of environmental assessment of other types of projects also led to the identification of issues that did not arise from discussions.

RESULTS

A number of observations relating to team activities were made, see Appendix 1, which were then considered in more detail in order to define the range of activities to be scoped. Table 1 illustrates the result of this scoping exercise and sets out some of the inputs and outputs of current team practices.

TABLE 1

	VEHICLES	**PESTICIDES**	**CAMP**
INPUTS			
Diesel	X		
Oil	X		
Water	X - radiators	X - washing	X - cooking, cleaning
Pesticides		X	
Batteries	Car	X -	X - radios, torches
Wood			X - cooking, warmth
Gas			X - cooking
Tyres	X		
Other spare parts	X	X	X
Food			X
Soap		X - for washing	X - for washing
OUTPUTS			
Noise	X	X	X - radios
Emissions to air	X	X	X
|Waste water	X -	X - pesticide washings	X
Waste oil	X	X - some machines	
Waste tyres	X		
Other spare part waste	X	X	X
Waste batteries	X - car	X - some sprayers	X - radios, torches
Waste plastic	X		X
Waste paper	X		X
Waste tins	X		X
Waste drums	X	X	X
Food scraps			X
Human waste			X
Fire residues	X - eg oil cartons	X - packaging	X - packaging
INTERACTION	**WITH LOCAL**	**ENVIRONMENT**	
Operations at site including storage	X	X	X
Survey and control operations	X	X	X
Camp relocation	X	X	X
INTERACTION	**WITH LOCAL**	**POPULATION**	
Physical	X	X	X
Cultural	X	X	X

Some of these aspects were then examined more closely and a range of questions that were posed are given in Appendix 2. This brief and incomplete assessment showed that current team activities do have some adverse impact on the environment. The most obvious impacts are the high level of vehicle use and the importation of modern materials and lifestyles into a remote environment which is often only marginally affected by modern life.

Vehicle use contributes to adverse environmental impact globally as well as locally due to the demand for fuel, oil, tyres and other spare parts, the emissions to air and the disposal of waste oil, old tyres and batteries.

The use of modern materials generates a range of waste which has unknown persistence in the desert environment, for example batteries used in sprayers and for torches and radios, soap powder, plastic, pesticide washings.

The requirement for water, not only for domestic tasks but also for washing of people, clothing and equipment following pesticide use, is considerably higher than that of a traditional nomadic lifestyle and may also be unsustainable in the local environment. The significance of such impacts needs to be quantified through further study.

DISCUSSION

1. The significance of the adverse environmental impact of current team activities can only be determined in conjunction with consideration of the following:

a. What is the responsibility of Mauritania and the Locust Centre (CLAA) towards the minimisation of global environmental impact both with regard to reduction of pollutants and to the protection of remote and fragile environments which are subjected to increasing desertification and climate change?

b. What are the requirements of donors towards environmental protection?

c. How do team activities relate to traditional nomadic lifestyles which have historically been sustainable in the desert environment, for example water and wood requirement, length of stay in one location, type and amount of waste produced and disposal methods?

d. What is the persistence of some of this waste and its effect on the environment?

e. What is the cost-benefit of using cheaper products that need to be replaced more frequently and of using older equipment which is less efficient and requires higher maintenance compared to more expensive and newer products and technologies?

f. What alternative methods of survey and control exist and what are the environmental costs of these?

2. Once some of these questions have been answered, the CLAA will be in a position to determine the true financial and environmental cost of current operations. With this information available, the CLAA can then decide on how to amend current operations in order to eliminate/reduce adverse environmental impacts and what mitigation measures should be put in place. Decisions would include what additional technology and techniques it would be appropriate to employ, ranging from the use of rechargeable batteries to greater use of aerial and satellite survey techniques. Such changes might also allow existing resources to be switched to other tasks.

3. The existing infrastructure of team operations could support additional staff at a small marginal cost. Such staff could either be used to carry out the surveys required for environmental assessment including monitoring of operations or for separate research. Alternatively, support could be offered to other bodies at a fraction of the cost to them of sending their own teams out.

4. The completion of the environmental assessment and the formulation of a policy of environmental best practice could be used as a model for similar operations elsewhere in the world and to demonstrate to donors the commitment of Mauritania to the concepts of sustainability and global environmental protection. The benefits to Mauritania and to the CLAA would be enormous.

5. It must be recognised that theoretical best practice must be adapted to the practical realities of resources available and field conditions applying. Where best practice and accepted methodologies cannot be met in the field, it may be appropriate to either redefine them to suit field conditions or to draw the attention of the wider community, including donors, to the realities of field conditions. If this is not done it is inevitable that, in some circumstances, unrealistic objectives will be set , that there will then be failure to meet them in part or in full and that this failure will be blamed on operational performance rather than conditions beyond the control of the operation.

CONCLUSIONS

Team operations do cause adverse environmental impact. The significance of the impact is not yet clear and this remains an area for investigation. Depending on the scale of impacts, opportunities do exist to change some current practices in order to eliminate or reduce adverse impacts. Some changes may be made at little cost merely by amending procedures. Other reductions in impact may only be achieved by reviewing current operations, amending operational activities and making greater use of modern technology and techniques.

The CLAA benefits from being a relatively small organisation, open to new ideas, where trials of methods and equipment can be undertaken and changes will easily be able to be implemented. The social duty of the Centre to its staff and to the nomadic community throughout any process of change is recognised.

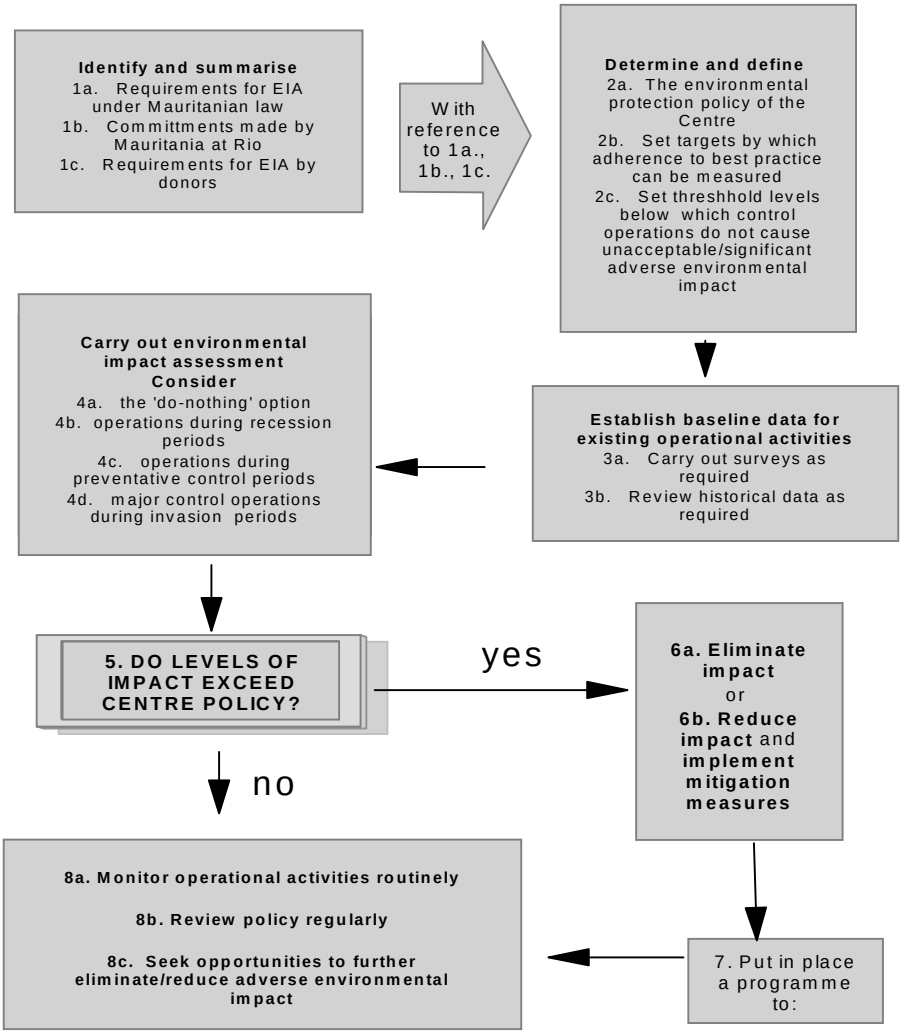
RECOMMENDATIONS

The full significance of environmental impact arising from team operations is not known. Further work is required if a full environmental assessment is to be carried out of the activities of survey and control teams. This work could form the basis of an Msc thesis.

The individual tasks that need to be carried out in order to undertake an environmental assessment on desert locust survey and control team operations are set out in Figure 2, below.

Figure 1

Recommendations



Step 1 may be rapidly carried out, if the information is not already available. Steps 2a and 2b may already be complete in part but 2c is likely to be largely subjective at this stage without detailed chemical/economic information being available.

Step 3 should be started as soon as resources are available. Step 4 will depend on Step 3 having been completed and 2c having been determined, although 4 may be started for specific aspects without 2 and 3 having been finished.

Decision making at 5 will lead ultimately to 8, perhaps via 6 and 7.

It should be noted that a key part of environmental impact assessment is to consider a range of options for action including the ‘do-nothing’ option. In this case the assessment should

involve a comparison between the predicted impacts of team operations arising from continuous survey and control operations compared to those of no action except for major control operations. The stages of environmental assessment and some of the options that should be considered in this case are shown schematically in Appendix 3. It is acknowledged that there would be wider environmental impacts, for example of crop loss leading to urban immigration and social disruption and the importation of food aid but this is part of the larger decision-making process of desert locust control rationale.

APPENDIX 1
LIST OF OBSERVATIONS MADE IN THE FIELD OF TEAM OPERATIONS

1. There is a high reliance on vehicles for operations and team support and resupply.

2. Operations are located near/within areas of locust activity. The location and duration of team camps will therefore vary. However, the nature of the rainfall and vegetation patterns means that teams may return to areas year after year and are likely to choose favoured camp sites. This is likely to result in cumulative impact in restricted areas more quickly than otherwise imagined.

3. Radio contact was regular; ensuring safety back-up and allowing exchange of information and optimal targeting of resources. This provides the opportunity to optimise resupply through timely requests from the teams.

4. Some operations take place near centres of population and existing transport corridors where the environment has already suffered some environmental impact which continues.

5. Operations also take place in remote locations where the introduction of new materials and new cultural habitats are likely to be significant even at low levels of operation. Team leaders commented that they are accustomed to camp life and would not expect to import any wider range of goods to change the nature of camp life but they do welcome the opportunity to visit town every so often to restock and for a change. Prospecteurs from other Maghrebian countries commented that camp life of teams in Mauritania is much harder and more basic than they are used to when on survey in their own countries.

6. When teams are based at remote locations, supply and resupply involves long journeys.

7. Wood, water, meat and milk may be available locally. Team consumption levels may be different from traditional nomads and may not be sustainable for long in some areas. Wood can be scarce in many areas and teams also assist nomads by sharing wood found at some distance from the camp and transported by vehicle.

8. Vehicle refuelling and maintenance, including oil changes, takes place in the desert. Waste oil is often requested by the nomads who use it to treat camel disorders. There is a risk that used oil may be carcinogenic.

9. Vehicles needed to be run each day in order to recharge old batteries.

10 Pesticide transport, storage and handling are necessary during field operations.

11. Soil contaminated by pesticide was collected for disposal and is buried but team leaders have some concerns about possible impact on grazing animals and groundwater. There was some discussion about whether it would be better to leave the contaminated soil exposed to be acted on by sunshine..

12. Team leaders were keen to avoid spraying if it was considered unnecessary or that conditions were unsuitable. It is not known whether decisions were monitored or consistent across teams.

13. Good relations with nomads are essential and were observed; although some nomads are initially unhappy about spraying being carried out.

14. Stock wandered across sprayed areas within an hour of spraying. There was no herdsman with the stock.

15. Spray vehicles, equipment and pesticides were stored about 50 metres from the camp, often under trees.

16. The use of spray equipment, torches and personal radios result in a large number of batteries being used. Cheap batteries have a short life and need to be replaced frequently resulting in the generation of waste batteries. Electric lights are not generally used at night, partly because of the nuisance of insects attracted by bright lights. This means there is a heavy reliance on torches. Solar panels have been considered but are too expensive and fragile for daily use by teams. Teams were interested in trialing torches with wind-up and integral solar panels.

17. Waste, including plastic, batteries, tins was collected and buried. However, as a result of discussions in the field and issued raised at the annual Journee de Reflexion held by the CLAA, waste batteries are now brought back into Nouakchott for disposal. (Batteries known to be over 20 years old have been found in the desert, showing signs of only very slow decay.)

18. Staff made their own toilet arrangements.

19. When dead wood was available it was used for cooking, for making charcoal and in cold weather for keeping teams warm.

20. Protective clothing was worn but was not completely adequate and cannot be properly cleaned in the field. Protective clothing is difficult to clean, is worn for too long, may become damaged and may not be either cleaned properly or destroyed at the end of the season. Overalls may also be worn around the camp as extra clothing in cold weather.

21. Teams felt that CLAA policy and its implementation by teams does get updated each year and that they have become much more aware of environmental issues since the beginning of this study.

APPENDIX 2

A non-exhaustive list of questions on which an evaluation of current operational practices may be based.

VEHICLES

1. Distance travelled

Can distances be reduced to reduce:
- Fuel consumption
- Wear and tear
- Emissions

2. Routes taken

What is the effect of terrain on vehicles and fuel consumption

What is the effect on local populations of noise/disturbance/emissions

3. State of repair/age of vehicles

What is the effect on:

Fuel consumption

Spare part requirement

Additional travel by mechanics

Capacity of batteries to hold charge

Reliability

4. Appropriateness for role

Are the vehicles the best for the job?

Could roles of vehicles be combined eg Unimogs also spray?

If roles changed should different vehicles be used?

5. Risk of pollution

What is the risk of pollution:

PESTICIDES

1. Condition of equipment

Is equipment:

Fully working eg no leaks

Properly calibrated

Are all parts correctly attached

Is the appropriate range of nozzles etc available

What is the response time to get repairs made?

What methods are adopted if equipment breaks or is otherwise not available eg pumps to transfer pesticide

Are log books kept

What spare parts are kept

2. Storage of materials and equipment

Are they appropriately stored

3. Cleaning of equipment and clothing

Is cleaning able to be undertaken routinely to an adequate level

Is the high cost of purchasing water in remote locations adequately budgeted for

What is the effect of soap powder on the environment

4. Disposal of waste

What are disposal methods for:

Waste pesticide

CAMP

1. Location

Does the camp require physical changes to be made to the environment

Is it visually intrusive

2. Fuel for cooking

Is the team self-sufficient?

What is the effect of using locally gathered wood on the environment (including insects and local people)?

How are used gas cylinders disposed of?

Is animal dung used

3. Water

Does the use of locally available water contribute to a cumulative environmental impact?

What is the environmental cost of travelling to obtain water?

What is water used for?

Is enough water used to ensure proper cleaning of clothing and equipment following application of pesticides?

Could water be obtained by distillation etc?

4. Food

How are supplies obtained?

How is it stored?

During refuelling/oil change
How are tyres/waste oil/batteries etc disposed of

Washings and soapy water following cleaning of equipment and clothing
Contaminated soil
Used batteries

5. Monitoring of application operations

Is monitoring carried out:
To identify correct application due to:
- Correct calculation of dose required
- Correct calibration of sprayers
- Correct speed of applicators and vehicles
- Correct swath widths

6. Equipment

Is it:
Appropriate to field conditions and required operations
Easy to calibrate and maintain
Are safety features maximised
Is risk minimised eg easy pour barrels specified
Do sprayers and chemicals match
Are problems with equipment fed back and design faults identified
Are containers regularly checked for leaks/structural weaknesses
Are all containers properly labelled

7. Staff skills

Are levels of knowledge and practical skills appropriate to the tasks undertaken

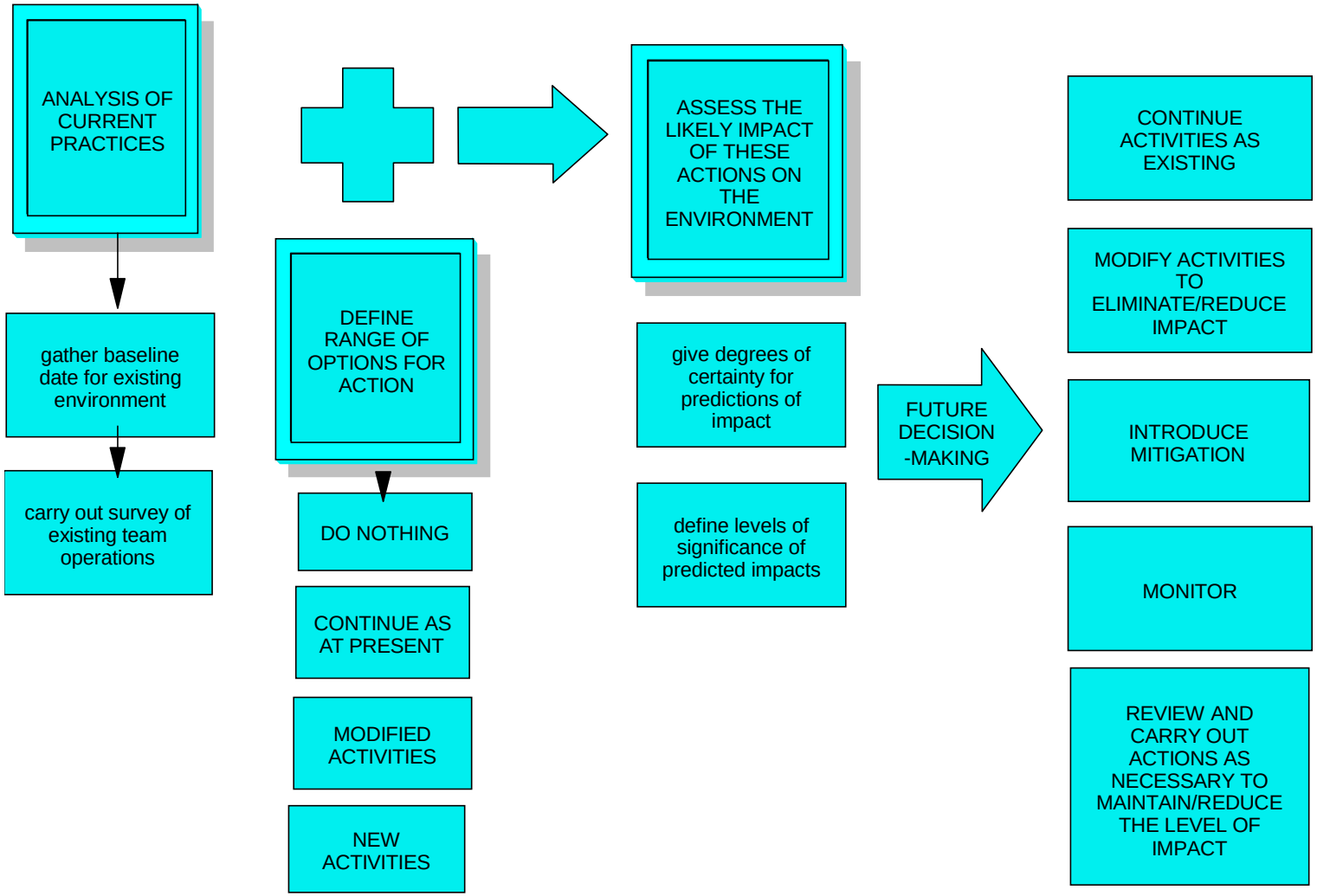
5. Waste

What waste is generated?
How is it disposed of?
Are plastics/glass/tins recycled or returned to base?
If left in the desert, how long do they take to break down?
What happens to waste batteries?
Can solar power be used for personal and team equipment?
Are more expensive batteries better for the environment?
What are the risks to the local environment/population from team toiletting

Are standard operating procedures applied
Is decision making consistent across teams
and over time eg when to spray

APPENDIX 3

A. ENVIRONMENTAL ASSESSMENT PROCESS RELEVANT TO TEAM OPERATIONS SHOWN SCHEMATICALLY



ANALYSIS OF DIFFERENT OPTIONS SHOWN SCHEMATICALLY