Keeping watch on agrochemicals

RIU

Validated RNRRS Output.

New tools are helping Caribbean countries introduce effective controls on agrochemicals. A policy and management strategy document provides key recommendations. A toolkit for National Plans of Action supports national level implementation within the regional strategy and to satisfy international regulations. Although, these documents were developed in the Caribbean, they are generic and can be applied more widely in other developing countries and to African and Pacific States faced with the threat of losing market access to Europe. The tools are used extensively throughout the Caribbean, promoted by regional organisations. Nationally, implementation of the strategy has spread from two countries in 2003 to eight (St. Kitts and Nevis, Trinidad and Tobago, Suriname, Dominica, Antigua, Belize, Jamaica and St. Lucia) in 2006.

Project Ref: **NRSP11:**
Topic: **1. Improving Farmers Livelihoods: Better Crops, Systems & Pest Management**
Lead Organisation: **MRAG Ltd, UK**
Source: **Natural Resources Systems Programme**

Document Contents:

Description

NRSP11

Research into Use
NR International
Park House
Bradbourne Lane
Aylesford
Kent
ME20 6SN
UK

Geographical regions included:

Caribbean,

Target Audiences for this content:

Crop farmers,

A. Description of the research output(s)

1. Working title

A Strategy for management of agro-chemicals for improved public and environmental health and national action planning tools for its implementation.

Short title: Agro Chemical Management Strategy and National Plan of Action toolkit

Note referred to in the following text as the 'Strategy' and the 'NPA Toolkit'.

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

Natural Resources Systems Programme

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities.

R no	Institutional partners	Current contact persons
R7111	MRAG Ltd	Chris Mees
R7111	British Geological Survey	John W Baldock
R7668	MRAG Ltd	Chris Mees
R7668	Coordinating Group of Pesticide Control Boards of the Caribbean	Everton Ambrose
R7668	Caribbean Environmental Health Institute	Andrew Lewis
R7668	Pesticides Control Authority, Jamaica	Hyacinth Chin Sue Walters
R7668	Pesticides Control Board, Ministry of Agriculture, St Lucia	Guy Mathurin
R7668	Ministry of Agriculture, Forestry and Fisheries, St Lucia	Julius Polius; Joan Norville
R7668	Centre for Marine Science, University of the West Indies	George Warner
R7668	Department of Life Science, University of the West Indies	Dale Weber
R7668	Caribbean Coastal Area Management Foundation	Peter Espeut
R7668	Department of Chemistry, University of the West Indies	Tara Dasgupta

R7668	Caribbean Agricultural Research and Development Institute	Leslie Simpson
R8364	Pesticides Control Authority, Jamaica	Hyacinth Chin Sue Walters
R8364	Pesticides Control Board, Ministry of Agriculture, St Lucia	Guy Mathurin
R8364	Ministry of Agriculture, Forestry and Fisheries, St Lucia	Julius Polius; Joan Norville
R8364	Coordinating Group of Pesticide Control Boards of the Caribbean	Everton Ambrose
R8364	Caribbean Environmental Health Institute	Herold Gopaul
R8364	MRAG Ltd	Chris Mees
R8364	Caribbean Agricultural Research and Development Institute	Claudette de Freitas

4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? ***(max. 400 words)****. This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address. Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.*

The need for effective control of **agro-chemical pollution** and exposure to agrochemicals is internationally well recognised (e.g. **Land Based Sources (LBS) of Pollution Protocol** to the Cartagena Convention**,** Stockholm Convention on **Persistent Organic Pollutants (POPs),** Rotterdam Convention on the Prior Informed Consent Procedure for Certain **Hazardous Chemicals** and **Pesticides** in International Trade, Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal. Pollution from agriculture can impact negatively on a broad spectrum of people, especially in regions where much of the population lives near to water and rural populations are largely dependent on agriculture. Fishers and farmers are often amongst the poorest and their livelihoods are critically dependent on fertile soils, healthy aquatic ecosystems and availability of markets for their produce. Agrochemical pollution can raise the costs of agricultural production through soil contamination, phyto-toxicity and pest resistance. It threatens farmers' livelihoods and raises public health concerns when residues are found in water and on foods. These residues have become technical barriers to trade in agricultural produce. Down-stream, agricultural pollution can undermine fishers' livelihoods, impact on other ecosystem services by degrading sensitive aquatic resources in lakes and rivers and those of the coastal zone, particularly coral reefs, thereby endangering tourism amenity value. Pollution also impact negatively on recreational activities such as swimming and picnicking in rivers.

The cluster of Outputs developed an integrated approach for regional and national scale management of agro-chemicals in the Caribbean. A **policy and management strategy** document was developed (2000-2003) to guide policy makers and managers in the implementation of key recommendations for improved agro-chemical management and **governance**. At the regional level the strategy aimed to harmonise existing multiple systems for agro-chemical management to ensure a more efficient system for importers, regulators and farmers. It was promoted through the development of regional plans of action (2004/5) by the regional Coordinating Group of Pesticide Control Boards and lobbying the regional Secretariat Caribbean Common Market (CARICOM) to gain support of the relevant ministers. A **toolkit** for implementing **National Plans of Action** was also developed

(2004/5) to support national level implementation within the context of a harmonised regional strategy and to satisfy the requirements of the LBS Protocol and POPs convention. The strategy is underpinned by a series of documents summarised and presented as six Information Briefs. Promotional material (videos, posters, policy briefs, flyers etc) were also produced by the project to support lobbying. The communication tools sought to get the involvement of all stakeholders in the preparation of national plans for a more holistic approach to agrochemicals management.

The policy, management strategy and the toolkit for developing a national plan of action were developed in the context of the Caribbean. However, the documents are generic and applicable more widely to other developing countries that are required to complete National Implementation Plans for POPs and to African and Pacific States faced with the threat of losing market access to Europe. Africa, Caribbean and Pacific (ACP) states which traditionally relied on exports of agricultural produce to Europe to generate income for rural populations are all faced with the problem of developing food safety management systems (EUREPGAP) wherein pesticides management is critical. Regional harmonised procedures have been the most widely accepted approach in all these regions as they seek to improve efficiencies with limited resources (see also Q 9). Misuse of pesticides is a big problem in Central Africa.

5. What is the type of output(s) being described here?
Please tick one or more of the following options.

Product	***Technology***	***Service***	***Process or Methodology***	***Policy***	***Other Please specify***
x			**x**	**x**	

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

Any commodity that requires the use of agro-chemicals (crops, livestock). Aquatic resources (fish) will also benefit form improved management of agro-chemicals.

7. What production system(s) does/could the output(s) focus upon?
Please tick one or more of the following options. Leave blank if not applicable

Semi-Arid	***High potential***	***Hillsides***	***Forest-Agriculture***	***Peri-urban***	***Land water***	***Tropical moist forest***	***Cross-cutting***
	x				**xx**		**x**

8. What farming system(s) does the output(s) focus upon?
Please tick one or more of the following options (see Annex B for definitions).
Leave blank if not applicable

Smallholder rainfed humid	***Irrigated***	***Wetland rice based***	***Smallholder rainfed highland***	***Smallholder rainfed dry/ cold***	***Dualistic***	***Coastal artisanal fishing***	***Inland fisheries***	***Deep sea fisher-ies***

x	x	x	x	x	x	x	x	

*9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).*

There are a number of relevant international bodies that have global representation including the DFID PSA countries, and a number of regional bodies with which linkages would be beneficial. Outputs from the Pesticides Initiative Project (PIP) which is being funded by the European Commission in collaboration with the COLEACP would enhance the adoption of this Output. PIP has undertaken a complete review of agricultural practice focusing on eight crops which represent 72% of ACP exports to Europe. PIP is undertaking research to harmonise agrochemical procedures within regions in African Caribbean and Pacific States which face the common problem of market access to the European Union as well as misuse of agrochemicals. Projects are currently in Kenya, Ghana and Tanzania on activities supporting export. PIP also focuses on communication with core activities being dialogue promotion, access to information and reinforcement of local regulatory authorities, all relevant to this Output. International treaties such as the Stockholm and Rotterdam Conventions identify pesticides that are persistent, banned or severely restricted which are also applicable outputs.

Lobbying of countries in regional bodies with policy messages from this Output and how to support implementation through a regional plan of action would be applicable to African countries. Two new bodies are the Pesticides Committee for West African Wetlands (CPAOH), represented by Benin, Côte d'Ivoire, Ghana and Togo. A fifth member, Guinea-Conakry, was unable to take part but confirmed its support. The second body, the Central African Pesticides Committee (CPAC), includes Cameroon, Gabon, Equatorial Guinea, Central African Republic, Republic of Congo and Chad. With the nine countries of the Permanent Inter-state Committee for Drought Control in the Sahelian Zone (ICDCS), which already uses a harmonised registration procedure, three large regions of West and Central Africa now have a regional body charged with the harmonised registration of pesticides. In Eastern Africa regional structures are erratic. GTZ and PIP further proposes regional harmonised procedures for the South African Development Committee consisting of Burkina Faso, Cape Verde, Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Chad.

West Africa has both English and French speaking countries. The French speaking countries consisting of Senegal, Mali, Ivory Coast, Burkina Faso and Benin are more advanced than the English speaking ones, Nigeria, Ghana, Liberia and Sierra Leone in agrochemicals management, and there are opportunities to benefit from that experience.

The Association of South Asian Countries in Nepal which is very adversarial and a stronger South East Asian group are both regional bodies for agrochemicals management.

In addition, outputs from National NGOs could provide a cultural perspective. For example the Nature Conservancy and Jamaica Conservation and Development Trust working in the Rio Grande Watershed with indigenous Maroons to restore and protect the ecosystems and the livelihoods have found that recreational activities are affected and made recommendations for enforcement of legislation**.**

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

NRSP R8428, R8349 on Communication strategy for East Africa, R8403, R8197 IPM for smallholder cotton in Uganda, R8477 wild rice management strategies in Tanzania, 88219, R7405/R8452,R8215 Increasing food security Tanzania phase II,R7562, R8223,R8103 Participatory Action Plan Development in Bangladesh and Pan Action Network UK output living with poisons [1] would add value to current project outputs

The UNEP Strategy for Integrated Chemicals Management (SAICM) calls for inter-ministerial coordination for chemicals management and sets recommendations for chemicals management by countries (www.chem.unep.ch/**saicm**).

[1] Glin, L.C., Kuiseu J, Thiam A. Vodouhe D. Dinham B and Ferrigno S. Living with poisons, problems of endosulfan in West African cotton growing systems 42 pages

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Validation

B. Validation of the research output(s)

*10. **How** were the output(s) validated and **who** validated them?*

*Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the "who" component detail which group(s) did the validation e.g. end users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation **(max. 500 words)**.*

The Strategy for management of agro-chemicals for improved public and environmental health was developed based on situation analyses conducted between 2000-2003 in collaboration with the Pesticide Control Authority (PCA) and Pesticide Control Board (PCB) in Jamaica and St Lucia respectively. It is targeted at influencing policy and management decisions on the management of agro-chemicals in both the regional and national context. The Strategy was adapted, made regionally applicable, and validated by members of the Coordinating Group of Pesticide Control Boards of the Caribbean (CGPC) through working groups held in conjunction with annual meetings of the CGPC. The Strategy was endorsed and adopted by the CGPC in June 2003. CGPC membership represents 65% of the countries within CARICOM, and subsequently (2004-2005) a lobby workshop was the mechanism to obtain support from other CARICOM members and regional organisations such as the Inter American Institute for Cooperation on Agriculture, the Organisation of Eastern Caribbean States and the Regional Negotiating Machinery. The Community Council of Ministers adopted the strategy in May 2005 after an initial presentation to the Council for Trade and Economic Development in January 2005.

Nationally, in Jamaica and St Lucia, components of the strategy were validated by developing mechanisms for a National Plan of Action to implement them. In Jamaica this related to monitoring pesticide residues in food and the environment and utilised a range of communication approaches including the involvement of Government Information Services in a comprehensive media campaign to reach farmers, consumers and policy makers. The

plan is currently being implemented in Jamaica The NPA was adapted for developing three additional plans for agro chemicals management by the Bureau of Standards, Ministry of Agriculture and the University of Technology There were extensive promotional activities in St Lucia targeting a similar audience.

The Toolkit to assist countries in the wider Caribbean to develop and implement National Plans of Action drew on guidance from the United Nations Institute for Training Research (UNITAR) and was both validated and developed based on the experiences of Jamaica and St Lucia. Feedback from two regional training sessions with staff of government bodies (PCBs and agricultural and planning departments) in the application of the toolkit was also used in further development and validation. At these workshops participants advised that the NPA would be used for National Implementation Plans required by Stockholm Convention

*11. **Where and when** have the output(s) been validated?*

*Please indicate the places(s) and country(ies), any particular social group targeted and also indicate in which production system and farming system, using the options provided in questions 7 and 8 respectively, above **(max 300 words)**.*

The strategy was validated regionally throughout the Caribbean at the CGPC meeting in June 2003, and at the CARICOM Community Council of Ministers in January and May 2005 held in Guyana.. Achieving endorsement of the Strategy by regional policy makers CARICOM ensures that national policies will comply with its recommendations (see also Q 21). The CARICOM Council on Trade and Economic Development which endorsed the strategy included ministers of Trade and sustainable development which are needed to provide the holistic approach that will be necessary to implement the strategy.

Nationally both the Strategy and NPA Toolkit were validated in Jamaica and St Lucia from 2004-2005 (and have also been used elsewhere, see 12, 13). The Toolkit was validated regionally at interactive training sessions held in Jamaica (Ocho Rios) in 2005. The main target group for the strategy and toolkit is regional and national policy makers and managers, particularly within Pesticide Control Boards / Authorities. The strategy was developed in the context of the land water interface, and examined agrochemical sources of pollution in the terrestrial and aquatic environments, and their impacts on public health. The strategy is generic and relates to any farming system that may employ agro-chemicals. Better management of agrochemicals will ultimately deliver benefits to farmers, fishers, consumers and the general public through improved public health and environmental conditions and, access to international markets (see also Q 21).

Current Situation

C. Current situation

*12. **How and by whom** are the outputs currently being used? Please give a brief description **(max. 250 words**).*

These Outputs are being used at a national and regional level primarily by bodies responsible for agrochemical management to influence policy, promote and implement plans of action for better agro-chemical management

and to influence the public and farmers towards good agricultural practices.

The Regional Plan of Action has been supported with funds from the United Nations Environment Programme (UNEP) Chemicals to implement two workshops with the involvement of CARICOM Secretariat. This enabled the group to explore collaboration to implement the Multilateral Environment Agreement. CGPC has been empowered to recommend further policy changes on behalf of the rural poor with whom they work closely. The lessons learnt are being employed by CGPC to seek CARICOM's approval to initiate regional registration. At the last meeting, CGPC continued to implement and promote the strategy and included in its recommendations a new submission to CARICOM Annex I.

The Caribbean Agricultural Research Development Institute (CARDI) has used the outputs in papers presented across the Caribbean to disseminate information on the status and effects of the use of agro-chemicals to regional audiences (Annex II)

Nationally, the Strategy has been employed to guide agrochemical management, and the toolkit used for developing national plans of action. Promotional materials have been used to sensitise people from the general public and consumers, farmers, companies producing and selling agro-chemicals, donor community to managers and policy makers in government.

The Certification of Agricultural Produce project of the Jamaica Agricultural Society and the Bureau of Standards have used the EUREPGAP Standards to develop a national standard on good agricultural practice.

The Strategy's recommendation for public health monitoring is being implemented by the Caribbean Poison Information Network and the hospital surveillance unit with the involvement of pharmacists, ministry of education, toxicologists, medical professionals and the PCA.

Pesticide companies have been involved with the PCA in programmes to restrict sales of certain toxic agrochemicals

13. ***Where*** *are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used* ***(max. 250 words).***

Regionally throughout the Caribbean by the CGPC, CARICOM Secretariat and by regional bodies such as the Caribbean Environmental Health Institute (CEHI) and CARDI.

Nationally all CGPC member countries have adopted at least one of the recommendations of the strategy, and through the involvement of CARICOM the influence of CGPC has increased (see Q 14). National and regional videos and posters were used during pesticides awareness weeks in 2005 and 2006 within CGPC countries.

Extensive use of the Outputs has occurred in: Jamaica and Belize which have implemented several recommendations of the strategy (e.g. cost recovery, public health monitoring, national database); Jamaica and St. Lucia are implementing inter ministerial plans of action and utilising promotional material; Montserrat has harmonised its legislation with Organisation of Eastern Caribbean States; St Kitts and Nevis has reviewed draft legislation and introduced sustainable financing. Dominica has undertaken a public awareness raising campaign;

initiated environmental monitoring together with the Environment Division, and work is in progress to determine pesticide residues on selected produce to include fruits and vegetables, breast milk (human and cow) and meat samples. Antigua has also drafted a new Pesticides and Toxic Chemicals Control Act, trained inspectors and advised distributors on the operation requirements for their premises. Elements of the strategy have also been applied in St Vincent and the Grenadines and Trinidad and Tobago.

14. What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading ***(max 250 words).***

Following completion and adoption of the strategy in 2003, and endorsement at CARICOM in 2005, lobbying of national governments continued and all CGPC members have adopted at least one of the recommendations of the strategy within a year of completion of the project. At the last CGPC meeting PIP expressed willingness to provide assistance for a legal review and drafting of legislation to support harmonised registration which has already started with the Organisation of Eastern Caribbean States and extended to Barbados. The toolkit has been used to develop National Plans of Action for POPs. CARICOM endorsement of the Strategy has strengthened the CGPC resulting in increased membership since 2005.

Nationally, implementation of the strategy has spread from two countries in 2003 to eight (St. Kitts and Nevis, Trinidad and Tobago, Suriname, Dominica, Antigua, Belise, Jamaica and St. Lucia) in 2006. Jamaica implemented four inter-ministerial national plans of action almost immediately. In St Lucia policy endorsement of the strategy resulted in the proposal for appointment of a full time registrar and staff for the PCB, and in St Kitts, addressing the sustainable financing element of the strategy, import licence fees were introduced. Other CARICOM countries like Dominica and Belize became parties to the Rotterdam Convention and initiated public health monitoring. Belize also employs full time staff, cost recovery, and trains pesticides users. *Antigua has done public health and* environmental monitoring work primarily in the area of POPs

Data collection on poisonings has increased and hot spots where poisoning is highest are being targeted for intervention.

15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key factors of success? ***(max 350 words).***

The development and ownership of the Strategy by members of the regional CGPC has been central to the success of its implementation. Sharing of information among CGPC members at annual meetings has contributed to capacity building. The development of a regional plan of action by CGPC has provided a framework to take forward the Strategy and attract donor funds. While CGPC represented only 65% of the CARICOM, the regional platform that brings ministerial attention to the recommendations of the strategy ensures that agrochemical policies are coordinated and there is support for its adoption. CARICOM support was achieved in 2005 (see 10). Support and promotion by recognised regional bodies like CARDI and IICA have also been influential.

External funding from UNEP Chemicals has enabled capacity building workshops to develop project proposals for implementing the strategy. Two consultation workshops to develop national plans of action for ratifying and implementing Rotterdam Convention were held in Trinidad and Tobago and Jamaica September 2005 and May

2006 respectively. Suriname, Barbados, Jamaica and Trinidad and Tobago participated. Familiarity with the toolkit made it possible to complete these NPA's.

Implementation of the strategy at the national level requires an integrated approach amongst existing Ministerial structures. This has required the development of new structures implemented through inter-ministerial national plans of action. UNEP Chemicals also encourages synergies among multinational environment agreements and has supported NPAs on chemicals management involving inter-ministerial coordination. Under that initiative a website for integrated chemicals management was developed (www.chemicalsafety.gov.jm)

Sensitisation of farmers, consumers and the general public has been important in achieving success. In this respect lessons learned from the NRSP projects on the development and implementation of Communication Plans have been important. Communications specialists have been important in developing and disseminating messages. Although a range of media have been employed, but face to face meetings and focus working groups have been particularly.

At a national level uptake of the strategy has been most successful in those locations where a dedicated full time staff exists. The level of training of people in the relevant agro-chemical bodies in the Caribbean is generally high but in those locations where no dedicated full time staff exists, competing duties limit uptake.

Current Promotion

D. Current promotion/uptake pathways

*16. **Where** is promotion currently taking place? Please indicate for each country specified detail what promotion is taking place, by whom and indicate the scale of current promotion **(max 200 words).***

Since the end of the RNRRS, the Strategy and NPA Toolkit continue to be promoted by representatives of CGPC member states and with the assistance of CARICOM Secretariat. A regional workshop is currently being organised to brief non-CGPC member states take forward the proposal for implementation of regionally harmonised registration to CARICOM

Nationally, CGPC representatives continue to promote the strategy at a policy level. Promotional materials have been used by the PCBs / PCAs in Jamaica, Dominica,St Lucia, St Kitts and Nevis, Antigua, St Vincent and the Grenadines and Belize during Pesticides Awareness week.

Outside the Caribbean NRSP Research Highlights 2003/04 was distributed globally and contained an article 'Researchers as communicators: solving agro-chemical pollution problems in the Caribbean'. The NRSP website also promotes this Output to a global audience, albeit passively.

The strategy is promoted passively on the NRSP and PCA (www.caribpesticides.net) website.

Details of the strategy have also been promoted among African and Asian delegations at the Third meeting of the Conference of Parties of the Rotterdam Convention

At two workshops sponsored by PIP and UNEP, the Strategy has been promoted as the document which highlights that programmes that need to be implemented to improve agrochemicals management in the Caribbean

17. What are the current barriers preventing or slowing the adoption of the output(s)? Cover here institutional issues, those relating to policy, marketing, infrastructure, social exclusion etc. ***(max 200 words)****.*

Regional implementation requires that non-CGPC members are familiarised with the recommendations of the strategy and plans to move forward. This has caused some delays as new members and non-members have to be updated, but on the whole uptake at this level has been good.

Nationally, lack of institutional capacity (dedicated full time staff) is a severe constraint. Currently, the range of tasks required to effectively improve agro-chemical management involves part time inputs of several agencies, requiring an integrated approach and there is reluctance to coordinate in some instances. Legislation in some locations does not provide the necessary tools for enforcement. In others enforcement against misuse of pesticides by small farmers is not generally supported by the government and the public. Financial constraints affect infrastructure. Laboratories are either not available or inadequate for residue monitoring and are perceived as low priority by governments

At the farmer level human and financial resources are limited in relation to the scale of the task for providing training in good agricultural practices and changes in use patterns. The number and capacity of extension staff often needs enhancing, and farmers may have low literacy levels and are resistant to change. Whilst radio and television broadcasts are effective the cost of maintaining campaigns can be prohibitive, and may not be relevant in all countries. Alternative means of reaching them must be found..

18. What changes are needed to remove/reduce these barriers to adoption? This section could be used to identify perceived capacity related issues ***(max 200 words).***

The Strategy highlights changes needed to overcome these barriers to adoption in line with the LBS protocol of the Cartagena Convention. Harmonised procedures for agrochemical management supported by legislation across a region are needed to ensure that only those chemicals that can be safely managed are imported. Institutional analyses are needed to identify and address national and regional capacity requirements and avoid duplication of effort. PCBs must employ full time staff and appropriate, sustainable cost recovery mechanisms for agrochemicals management. Where agrochemicals management in under the portfolio of the Ministry of Health or Environment, better access to regionally available funds for agriculture is required.

In implementing the strategy communications experts are required to properly engage (sensitisation, training) the wide range of stakeholders and to apply new approaches to prevent pesticide misuse. They should help to convey relevant messages relating to Good Agricultural Practices and environment and health issues related to agrochemical misuse in light often low level extension services. Research in support of better agricultural management is also needed in the areas of Integrated Management of Pests and Pesticides, and the socio-economics of alternative farming practices. Adequate long term monitoring plans need to be put in place with

respect to public and environmental health.

19. What lessons have you learnt about the best ways to get the outputs used by the largest number of poor people? ***(max 300 words).***

These Outputs are designed to create an enabling environment that will ultimately benefit the poor. They are not intended to be used directly by poor farmers. At a regional level targeted and sustained lobbying of key policy and decision makers was the key to getting the Strategy adopted by CARICOM. Capacity building in the form of training workshops for the NPA Toolkit were instrumental in promoting both the toolkit and strategy to national representatives of PCBs and Planning authorities. With this level of awareness and support, governments are more likely to allocate or source funds for agrochemicals management. It is in the implementation of the strategy that the poor are engaged. The key to gaining their involvement has been through a concerted and co-ordinated communications campaign supported through capacity building by agricultural extension services provided either by Departments of agriculture, or by the agro-chemical companies who supply the products. The latter were also engaged in the development of the Strategy and attend CGPC meetings, and are in a good position to apply some of the recommendations directly with poor farmers.

Radio interviews and television 'infomercials' were found in the Caribbean to be the fastest means of communicating to poor farmers. It would be necessary to evaluate if this were the case in Africa and Asia.

Impacts On Poverty

E. Impacts on poverty to date

20. Where have impact studies on poverty in relation to this output or cluster of outputs taken place? This should include any formal poverty impact studies (and it is appreciated that these will not be commonplace) and any less formal studies including any poverty mapping-type or monitoring work which allow for some analysis on impact on poverty to be made. Details of any cost-benefit analyses may also be detailed at this point. Please list studies here.

NRSP Project R7668 undertook a number of studies that included compiling information on the impact of agrochemicals, mostly upon the environment. These formed the basis of further work that led to the development of this output, but do not show poverty impacts of this Output. They may be downloaded from the NRSP website : www.nrsp.org.uk see publications sections of projects R7668 and R8364. The most relevant include:

Report 2: Simpson, L., 2003. Review of soil management and farming practices, including the use of agro-chemicals in the Caribbean, with particular reference to St Lucia and Jamaica. DFID NRSP Project R7668. CARDI (Jamaica).

Report 3: Dasgupta, T. and C. Perue, 2003. Toxicity review for agro-chemicals in St Lucia and Jamaica. DFID NRSP Project R7668. Chemistry Department, UWI, Mona.

Report 4: Boodram, N., 2002. The fate of agro-chemicals in the land-water interface, with reference to St Lucia and the wider Caribbean. DFID NRSP Project R7668. CEHI.

Report 5: Edwards, P., 2001. The fate of agro-chemicals in the land-water interface, with reference to Jamaica and the wider Caribbean. DFID NRSP Project R7668. Centre for Marine Studies, UWI, Mona.

Report 6: Lewis, A. and N. Esteban, 2002. Environmental survey of agro-chemicals in the land water interface of St Lucia. DFID NRSP Project R7668. CEHI and MRAG Ltd.

In Jamaica there has been data collection on the number of pesticide associated poisonings. Mapping of poisoning is ongoing (Annex III) and comparisions are available among poison incidence from sources other than agrochemicals.
In Antigua and Belize public and environmental monitoring of the impacts of agrochemicals occurs, as reported elsewhere in this Proforma.

Pesticides Action Network (UK) publication entitled “Living with Poisons” reports on impacts on poor in West Africa and the importance of market access for cotton produced by West African Countries to their economies.

Other publications relevant to these outputs and Africa are:

Public Health Impact of Pesticides in Agriculture WHO in collaboration with UN Environment Programme WHO Geneva, 1990

Mutume G. African cotton farmers battling to survive; Mounting opposition to Northern farms subsidies, Africa Recovery (now called African renewal) Vol. 17#1 May 2003 Page 18

Quijano R, F Risk assessment in a third world reality; an endosulfan case history International Journal of Occupational and Environmental health 2000n Oct-Dec;6 (4):312-7

This NRSP Output is aimed at influencing policy and management. It aims to create an enabling environment. Many Outputs of the Fisheries Management Science Programme are also ‘enabling’ and for that type of Output the following study describes relevant impact assessment processes:

Arthur, R., A. Halls and C. Mees, 2006, Impact of fisheries management science: Experience from DFID’s Fisheries Management Science Programme. Paper 235 IIFET Conference Proceedings, IIFET, Portsmouth, July 2006

21. Based on the evidence in the studies listed above, for each country detail how the poor have benefited from the application and/or adoption of the output(s) ***(max. 500 words):***

- *What positive impacts on livelihoods have been recorded and over what time period have these impacts been observed? These impacts should be recorded against the capital assets (human, social, natural, physical and, financial) of the livelihoods framework;*
- *For whom i.e. which type of person (gender, poverty group (see glossary for definitions) has there been a positive impact;*
- *Indicate the number of people who have realised a positive impact on their livelihood;*
- *Using whatever appropriate indicator was used detail what was the average percentage increase recorded*

Arthur et al (2006) indicate that for 'enabling' Outputs the measurement of direct poverty impacts will be complex and that it is necessary to look at the chain of events required to bring about change in people's livelihoods and at the impacts achieved at different stages in that chain. In particular this type of enabling Output seeks to build capacity of intermediary organisations to ultimately deliver benefits to the poor. As described elsewhere these Outputs have contributed significantly to capacity building in the Caribbean and have been used by intermediary organisations to good effect (Q12-14). Some examples follow:

Achieving endorsement of the Strategy by CARICOM has ensured that national policies will comply with its recommendations and ultimately deliver benefits to the poor. The National Plan of Action to implement one recommendation of the strategy, to monitor residue on foods for example, protects public health by reducing availablity of foods with high residue levels on the local market. Farmers have also benefited from improved access to the local market since several locally produced foods do not require pesticide application except for post harvest treatment when intended for export. With greater consumer awareness on the dangers of pesticide residues, national policy on food safety is being strengthened and standards developed for certification of local agricultural produce that will also lead to public health benefits and access to international markets.

Implementation of the strategy has resulted in more appropriate application of agrochemicals to meet certification standards though not on a large enough basis because of low levels of extension service. It has also reduced access to more toxic pesticides resulting in less exposure of farmers and farm families especially children.

Good progress has been made through CARICOM to introduce a policy for regional harmonised registration of agrochemicals that will further control the availability of toxic agrochemicals. Additional funding from the Pesticides Initiative Project (PIP) has facilitated a visit of regulators from Jamaica, Antigua and St. Lucia to the Pesticide Safety Directorate of the United Kingdom where they were exposed to the EU regional registration system, further developing their capacity.

In Jamaica, data collected on pesticide related poisonings has shown no recent increase despite increases in bleach and pharmaceutical poisonings. Children less than 5 years old are the main victims of pesticide and other chemical poisoning. This may be attributed to greater reporting of poison cases through Caribbean Poison Information Network and the Public Health department, and to public awareness raising efforts through implementation of this Output.

Environmental Impact

H. Environmental impact

24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? ***(max 300 words)***

This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate

evidence can be provided in the form of an annex.

Increased biodiversity and maintenance of indigenous species can be achieved through improved use of agrochemicals. The longer an agro-chemical stays in the environment (the persistence), the greater the potential that it will harm non-target and/or beneficial organisms. The same is true for the impacts on human health. The order of persistence of agro-chemicals in the environment, from the most to the least persistent, is as follows: organochlorides > organophosphates > carbamates > pyrethroids. Pesticides are removed from agricultural lands by running water (run-off) and adsorbed to soil particles lost in erosion processes (wash-off). Soil surface movement of pesticides is usually accelerated by steep topography, low soil permeability, considerable rainfall, strong adsorption of pesticides to soil particles, and inadequate soil conservation measures in farming practices, all typical of agriculture in the Caribbean region. By implementing the recommendations in this output, such negative environmental impacts will be reduced.

There may also be social impacts associated to environmental use that better management of pesticides will enhance, for example, in the Blue Mountain region of Jamaica the culture of the Maroons whose live there is heavily linked to the river. Recreation for these people include river fishing, bathing, cooking by the river and washing of clothes. These conditions increase exposure if water pollution is not curtailed. Posioning of fish with persistent organic pesticides indirectly poison the population starting with mothers and their babies who are exposed in the womb and though breast milk.

25. Are there any adverse environmental impacts related to the output(s) and their outcome(s)? ***(max 100 words)***

Incorrect use of agrochemicals can lead to adverse environmental impacts. However, amongst others, this is one of the areas that the Strategy aims to address, and its proper implementation should not lead to any additional adverse impacts.

26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience? ***(max 200 words)***

Implementation of the recommendations of the strategy contributes to improved agrochemical management and towards environmental benefits. For example, damage to coral reefs will be reduced allowing them to provide greater protection during natural disasters such as hurricanes. .

Reduced exposure to more toxic agrochemicals in the environment results in improved health status of the poor farmers and their families. This is directly linked to productivity as more man days would be spent on the farm to increase production. Increased production should make available food for periods of extreme drought or flood due to climate change. Fewer resources would be needed from national budgets for healthcare. Market demand would increase as less imports completing in the local market. Furthermore export markets access would improve for provide income to producers.

Improved storage and distribution of agrochemicals reduces the risk of pollution during natural disasters such as floods

Annex

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