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ACCESS TO BIOCONTROL AGENTS TO COMBAT INVASIVE ALIEN SPECIES AND THE ACCESS AND BENEFIT-SHARING REGULATIONS

Note by the Executive Secretary

1. The Executive Secretary is pleased to make available herewith a submission provided by the African Insect Science for Food and Health (ICIPE) on a matter related to the negotiations of the international regime on access and benefit-sharing.

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Access to biocontrol agents to combat Invasive Alien Species and the Access and Benefit Sharing regulations

Fabian Haas, Bernhard Löhr, Peter Munyi and Ian Gordon

icipe – African Insect Science for Food and Health
Duduville Campus, Kasarani, P.O. Box 30772 – 00100, Nairobi, Kenya
Corresponding Author: Fabian Haas, fhaas@icipe.org

The *icipe* is pleased to participate in the Working Group on Access and Benefit Sharing (ABSWG-5) in Montreal, Canada, and to be able to bring in its 30 years of experience in the area of agriculture, pest management and invasive alien species to the process of the Convention on Biological Diversity (CBD). We take this opportunity to confirm our commitment to supporting the implementation of the Convention.

1. INTRODUCTION

It is widely recognized that the accidental introduction of new pest organisms or Invasive Alien Species (IAS), poses a major threat to the well-being of millions of people in developing as well as developed countries. The threat varies between mere nuisances to a direct menace of life. Classical Biological Control (CBC) combats these problems by the closely monitored and controlled release of specialised natural enemies from the original home of these pests. This technique has a long and successful history in the mitigation of the detrimental effects of IAS.

Inferring from our own almost daily experience, CBC for the abatement of problems related to IAS relies entirely on access to components of biodiversity. This entails collections and scientific studies of biocontrol agents in the country of origin of the pest and transfer of the most efficient ones to the country, whose agriculture and human well-being are threatened by the IAS. CBC leads to the generation of a public good, the mitigation of the IAS, to the benefit of all people in the affected region, for an unlimited period of time.

However, as a consequence of discussions on the international regime to implement access and benefit sharing provisions of the CBD, many countries have instituted legislation that seriously impedes any collecting and scientific studies on biodiversity, including biocontrol agents. We feel that many decision makers are not aware that access to biocontrol agents can be a case of life or death for millions of people and special regulation is therefore needed in such cases. Since IAS pose an increasing threat, CBC becomes equally important to the agrobiodiversity and sustainable use of biodiversity.
This is in contradiction to the CBD itself, which in several Articles calls for cooperation of the Parties for the benefit of all. Article 8(h) explicitly calls for a control of IAS, which has been the subject of CBC for many decades, and several highly successful examples are presented below. In order to ensure and successful containment of IAS, the International Plant Protection Convention (IPPC) under the roof of the FAO has already developed specific regulations and technical standards (IPPC, 2006). The expanding ABS regimes impede the research and application of CBC, which involves neither issues of ownership nor intellectual property rights, and thereby obstructing the successful cooperation in the spirit of the CBD.

Therefore, it is our view that the current debate on an international ABS regime does not apply to CBC and CBC ought to be exempted from ABS regulations, which are based on Articles 15 and 8(j). We notice with great concern that the current debate on an international ABS regime is expanding beyond its original concept and obstructs already existing and successful cooperations demanded by the CBD thus harming rather than helping the people.

With the intention to inform the participants, to stress the importance of CBC and to find practical solutions, we would like to bring forward this issue to the ABS negotiations to develop mechanisms that facilitate rather than obstruct access to biocontrol agents.

2. SITUATION

One of the major emerging threats for mankind as well as for biodiversity is the increased occurrence of IAS through global trade and travel. Complicated and expensive quarantine regulations are implemented to prevent the accidental introduction of possible IAS into agriculture and other ecosystems. However, international trade of goods and travel of people has reached a level and ease that these quarantine measures are incapable to rule out the introduction of exotic organisms. No country or region is safe from this threat.

This is not a new phenomenon. Despite such quarantine regulations, IAS already cause billions of USD in damages and losses in agriculture, already today, with an increasing tendency. Data from the GISP report (Anonymous, 2006) on invasive species and poverty show the enormous values lost through IAS:

"In 1993, the Office of Technology Assessment of the US Congress estimated that the 79 most harmful invasive species had caused damage of USD 97 billion in the USA since 1906. Pimental and colleagues subsequently updated and extended these estimates to other countries. Annual losses to pests were estimated at USD 6.24 billion in Australia, USD 42.60 billion in Brazil, USD 78.50 billion in USA, USD 5.56 billion in the UK, USD 91.02 billion in India and USD 4.30 billion in South Africa. Globally, the costs of damage caused by invasive species has been put at USD 1.4 trillion per year – close to 5% of global GDP."

"… the figures provide an interesting comparison between developed and developing countries. Estimated damage caused by invasive species was equal to 53% of agricultural GDP in the USA, 31% in the UK and 48% in Australia. By contrast, the damage in South Africa, India and Brazil amounted to 96%, 78% and 112% of agricultural GDP of these developing countries respectively."

The devastating effects of IAS on agriculture are twofold. Firstly, IAS destroy livelihoods by devastating crops and secondly, IAS affect international trade through interception and rejection of produce at the borders of potential export markets and have led to a collapse of trade of the affected crop altogether. The damage to ecosystem services has not been quantified at all.

No region or country can claim immunity against the problem of IAS, and so an efficient strategy to mitigate this threat is an international and regional challenge. Acknowledging this, the importance of international cooperation will increase tremendously, as will the importance of CBC.

3. CLASSICAL BIOLOGICAL CONTROL

3.1 Rationale and Approach

Classical Biological Control uses living organisms (called biocontrol agents or natural enemies) to combat pest organisms (this term includes pathogens, plants and animals) and accidentally introduced species (IAS). This technique uses specialized natural enemies, which invariably exist in the pest's place of origin and keep most pest species in balance at such low population levels that they may not even be known as pests. However, when moved from their natural ecosystem, such species escape control by their natural enemies and may become an IAS, changing their new ecosystems in an unprecedented degree and threatening the livelihoods of millions of people.

Thus, the standard procedure applied to combat these IAS is to locate their area of origin and find efficient natural enemies or biocontrol agents. These are collected, mass reared and released once their innocuousness to the new environment has been shown. The biocontrol agents are not modified or genetically engineered and so issues of ownership, intellectual property rights (IPRs) and release of genetically modified organisms (GMOs) do not apply to CBC. Historically, there is no case in which the rights of indigenous people and traditional knowledge have been touched on or infringed.

The search for and release of the biocontrol agents is generally done in close cooperation and partnership with local research institutes and under the strict control of international agreements, such as the ISPM regulations of the IPPC (IPPC, 2006) under the roof of the FAO, that pre-date the ABS regulations of the CBD.

However, such a process relies entirely on access to biodiversity, either in the form of already existing knowledge about natural control factors and their availability, or, as in some of the more spectacular cases listed below, procedures started with the search for, identification of, research on and finally import of previously unknown specialised natural enemy species.

The understanding of the threat posed by IAS – anywhere and any time - has produced a culture of mutual assistance among the community of professional biocontrol specialists worldwide, where the easy and quick access to and exchange of biocontrol agents was the rule. When biocontrol agents were not known, exploration entomologists were sent to the countries of probable origin of the pest and natural enemies were searched for, mostly in cooperation with local research institutions.

Regulations at the international level were only introduced when the IPPC issued guidelines on how to proceed with the importation of biocontrol agents. These ISPM guidelines (IPPC, 2006) were adopted by many countries and procedures were put in place in order to prevent unwanted introductions and negative side effects in cases where biocontrol agents were thought useful.

CBC is thus one tremendously successful example for cooperative efforts undertaken by the international community and countries to combat common threats and to use their genetic resources for the good of all people and for all countries. This is exactly what is called for by the CBD in Articles 1, 5 and 15. Furthermore, CBC fulfills Article 8(h) obliging the Parties to the CBD to control and eradicate IAS. Obviously, the practice of CBC is very much in line with the Convention.

The successful release of the biocontrol agent creates a pure public good (i.e. one that cannot or will not be produced for individual profit), as the natural enemy is available to all, at no additional cost and without continued involvement of research institutes or private sector companies. The biocontrol agents are not modified and thus cannot be patented so issues of ownership and intellectual property rights (IPRs) are not involved in this technique. The results of the scientific work are published and available for the public. The country of origin of the natural enemy benefits through this information too, and is able to improve its own biocontrol programmes accordingly.

Besides the direct benefits for the people, biological control provides additional beneficial effects for biodiversity. Since it replaces the use of pesticides, the possible negative effects such as accidental poisoning, insecticide resistance, detrimental effects on non-target species, and accumulation in the food-web are eliminated. The monetary burden and work load for repeated applications of pesticides are avoided and marketed products are free of pesticide residues. Therefore CBC increases health, livelihoods and food security for growers and consumers in the developing and developed world and contributes directly to the conservation and sustainable use of biodiversity.

3.2 Case studies

Classical Biological Control has a long and successful history. It improved the livelihoods and food security of millions of people, shown by the many countries with successful releases (Table 1), at remarkable low costs, with a remarkable high success rate (Table 2).

Table 1. Countries making more than ten introductions of insect biological control agents against arthropod pests. From Lenteren (2006).

Country	No. introductions	Successful controls	No of pests	Year started
Cape Verde Islands	25	2	10	1981
Comoros Islands	12	0	2	1969
Ghana	47	2	5	1948
Kenya	53	6	18	1911
Madagascar	28	3	11	1948
Mauritius	132	10	22	1913
Réunion	22	4	9	1953
Sénégal	17	1	3	1954
Seychelles Islands	30	6	13	1930
South Africa	106	11	32	1892
St Helena	20	4	6	1896
Tanzania	17	3	8	1934
Uganda	24	3	9	1934
Zambia	22	2	6	1968

Table 2. Comparison of data on performance of chemical and biological control (from Lenteren 1997).

	Chemical control*	Biological control
Number of ingredients tested	> 3,5 million	2,000
Success ratio	1 : 200,000	1 : 10
Developmental costs	150 million USD	2 million USD
Developmental time	10 years	10 years
Benefit / cost ratio	2 : 1	20 : 1
Risks of resistance	large	small
Specificity	very small	very large
Harmful	side-effects many	nil/few

*Data for chemical control originate from material provided by the pesticide industry; data as per 2005. In 1980 10,000 compounds were tested per year, in 2004 this had increased to 500,000 per year

The following case studies (unless otherwise stated from Neuenschwander et al 2003) are selected to illustrate the importance of successful CBC to the livelihoods of literally of millions people and the vast geographic range covered in the introductions. The case studies also demonstrate the close south-south and south-north cooperation in this endeavor. The cooperation comprises at least two, if not three continents. Many institutions, donors and countries are involved in each of the cases, contributing their strengths to the projects and distributing the successes to other countries in the region and beyond. The case studies further underline the character of CBC as pure public good, with no ownership and no infringement of IPRs and other rights, and the availability of the results to the general public.

Cassava or Manioc

Cassava (*Manihot esculenta* Crantz, Malpighiales: Euphoribiaceae) was introduced into Africa by the Portuguese in the 16^{th} century and is today the staple root crop for more than 200 million people in Africa alone. This major source for carbohydrates came under threat from two major pests, the Cassava Mealybug and the Cassava Green Mite.

Case Study 1: The Cassava Mealybug

The Cassava Mealybug (CMB, *Phenacoccus manihoti* Matile-Ferrero, Homoptera: Pseudococcidae) was first recorded in Congo and DRC (then Zaire) in the 1970ties and spread over the whole of the cassava growing area of Africa. CMB was accidentally introduced from South America, where it was inconspicuous, and could be located in Paraguay, Brazil and Bolivia only after conducting intensive fieldwork. In Africa, it led to a complete collapse of the cassava production, depriving several hundred million of people of their carbohydrate sources and livelihoods.

In an combined effort of the IITA of Nigeria and Benin, CABI Bioscience and IAPSC, biocontrol agents where found in the three South American countries. *Anagyrus lopezi* (DeSantis) (Hymenoptera: Encyrtidae) a parasitoid wasp was quarantined, shipped to Africa, mass reared, and finally, after permission of the local authorities was granted, released in field trials. The cooperation was so successful that in the whole of sub-Saharan Africa CMB is under complete control and poses no threat anymore.

Besides the successful control of CMB, this joint effort led to close south-south and international cooperation and to a significant increase in the capacities in biocontrol and agricultural entomology in sub-Saharan Africa.

Case Study 2: Cassava Green Mite

Beginning in the early 1970ties, cassava crops came under threat of another pest organism, the Cassava Green Mite (CGM, *Mononychellus tanajoa* (Bondar), Acari: Tetranychidae), originating from Brazil, which was accidentally introduced to Africa and first recorded in Uganda in 1971. The CGM led to local losses of up to 80%, more than a serious threat.

As in the case of the CMB, and international cooperation was initiated which included IITA, University of Sao Paulo, and another Brazilian institution, EMBRAPA, as well as CIAT in Colombia and Imperial Collage in the UK and finally, 25 African countries over 18 years. The natural distribution range of the CGM was found to be in Colombia and Brazil, and a predatory mite *Typhlodromalus aripo* DeLeon (Acari: Phytoseiidae) was found, sent to Africa, quarantined, mass reared, and after permission for field test was granted by local authorities, released.

The predatory mite is now established in no less than 20 countries in Africa, covering more than 3.8 million square kilometers and firmly controls the CGM. International and south-south cooperation has further improved through this project.

Case Study 3

Exotic Stem Borers in East and Southern Africa

Stem borers are the larvae of moths (Lepidoptera), sawflies (Hymenoptera) and other insects living and feeding in the stems of plants. As they also feed on grain, stem borers are a major constraint in the maize and sorghum production in East and Southern Africa. Key pest in the region is the Spotted Stalk Borer, *Chilo partellus* (Swinhoe, 1885) (Lepidoptera: Crambidae). It is an exotic species to Africa, being accidentally introduced from Asia sometimes before the 1930s. Earlier attempts for CBC were unsuccessful, however, the *icipe* together with the Agricultural University of Wageningen, The Netherlands, initiated a new attempt in 1991 with the release of the parasitoid wasp *Cotesia flavipes* Cameron (Hymenoptera: Braconidae) in costal Kenya in 1993. The parasitoids were collected in Pakistan by the IIBC and shipped to the *icipe* through the relevant Kenyan authority (KARI) and its quarantine station at Muguga, Kenya. Several collections were done to increase the genetic diversity of the released insects. In addition, ICRISAT in India contributed with collections of *Cotesia flavipes* reared from stem borers in sorghum plants. The collections from Pakistan and India were mass reared in the *icipe* and finally released with the permission of local authorities (KARI for Kenya).

The Kenyan release was successful and it was decided to expand the releases to eleven countries in the region: Mozambique in 1996, Somalia 1997, Uganda 1998, Malawi, Zimbabwe, Zambia, Tanzania and Zanzibar 1999, and finally in Eritrea 2003. Except in the last mentioned country, all releases were followed by establishment of *Cotesia flavipes*. The parasitoid was also recovered in Ethiopia, where it probably invaded from Somalia.

An economic impact assessment was conducted, using the cost-benefit-approach. Projecting from the period 1995-2004 in which data where collected, to 2014, twenty years after the release, it is assumed that the benefit-cost ration is 19:1.

This project was funded by the government of The Netherlands. The success of this programme was the result of a concerted effort by research institutions on two continents and the willingness of local authorities in each collaborating country in Africa to grant import permits for natural enemies and the readiness of Pakistan and India to allow for exporting the parasitoids to Africa.

Based on the existing regulations on biological control and its character as pure public good and the inapplicable IPRs and ABS issues made the timely release of a genetically diverse parasitoid possible, for the good of the local people and the food security. The details of this case study are found in Omwega (2006) and Kipkoech (2006).

Case Study 4
The Water Hyacinth

The Water Hyacinth (*Eichornia crassipes* (Martius) Solms, Liliales: Pontederiaceae) was introduced as an ornamental plant from its natural range in the Amazon Basin to many other locations. It was found on River Nile since 1870 and its first record in East Africa was in Tanzania 1955. The weed thrives on natural and artificial water bodies, covering huge areas with layers of plant material up to 2 m thick. This poses a number of problems: waterways and ports are blocked, the intakes of hydroelectrical power plants are obstructed, and oxygen circulation from air to water is interrupted thus impairing fish development. Furthermore, the plant itself provides a microhabitat for mosquito reproduction.

In 1989 the Water Hyacinth was first recorded on Lake Victoria, and quickly developed into a threat for the livelihoods of the 25 million people depending on the lake and the intake of water supply for towns and power plants. The huge area covered (15,000 ha) on Lake Victoria and the high growth rate of the plant demanded for a sustainable solution.

The World Bank and the FAO provided assistance to the lake neighbouring countries to manage this problem. Two weevils (*Neochetina eichhorniae* Warner, *Neochetina bruchi* Hustache, Coleoptera: Curculionidae) were introduced, quarantined, and after permission of the East African authorities mass produced and released in the Lake Victoria, with great success. The plant cover has reduced to insignificant degrees. Fishing as well a power supplies are secured again.

In this case the cooperation stretched over three continents. Since ownership and IPR are not involved in the pure public good character of classical biological control and the research results are available to the public, the transfer of technologies was quickly and easily achieved, for the good of the millions of people depending on Lake Victoria.

Case Study 5
The Potato Tuber Moth
The Potato Tuber Moth (PTM, *Phthoromaea operculella* (Zeller), Lepidoptera: Gelechiidae) is a pest of potatoes in all warmer regions around the world. Like the potato itself, PTM probably originates from the Bolivian Andes and was recorded in South Africa. First trials with CBC were unsuccessful, however, in 1965, new tests were conducted with a parasitoid wasp imported from Australia (*Apanteles subandinus* Blanchard, Hymenoptera: Braconidae) but also with species found during field exploration in South America by CIBC (*Copidosoma koehleri* Blanchard, Hymenoptera: Encyrtidae). Before introduction to South Africa, the species were quarantined in India. Based on the successful introduction to South Africa, the parasitoid wasps were later distributed to Mauritius, Seychelles, Zambia, Zimbabwe and Greece, Madagascar, Italy, Israel and the USA (California). In each case, quarantine and other regulations of exporting and importing countries were closely followed.
The successful south-south and south-north cooperation increased potato production in each of the countries and simultaneously reduced usage of pesticides, reducing negative environmental effects as well as costs for growers and customers.

Case Study 6
The Larger Grain Borer
The Larger Grain Borer (LGB, *Prostephanus truncatus* (Horn), Coleoptera: Bostrychidae) was accidentally introduced to Tanzania and Togo in the early 1980s. This Central American pest attacks various crops during their storage but in Africa mainly maize and cassava, both of which are essential staple foods in Africa. Thus, this beetle posed a serious threat to the nutrition and livelihoods of millions of people and accordingly triggered major research efforts. As international as the threat, the research institutions and donors from the affected African countries (Benin, Burundi, Ghana, Kenya, Tanzania, Togo), the Americas (Canada, Costa Rica, Honduras, Mexico, Nicaragua, and USA), and Europe (Denmark, Germany, Netherlands, Sweden, UK) took a concerted effort to investigate control strategies for LGB in Africa.
In the area of origin of this pest, Central America, LGB had insignificant effects on the stored crops, suggesting a good control by natural enemies, and so studies were conducted to find its natural enemies. The most promising of the enemies proved to be another beetle *Teretrius nigrescens* (Lewis) (Coleoptera: Histeridae), which was then mass produced, quarantined, and after the permission of the authorities in the respective countries were granted and other regulations fulfilled, released into the field. The release was partly successful depending on the region and climatic conditions, and leading to good biological control in Togo and Benin. Essential to the whole project was the close cooperation of the partners contributing their expertise, such as quarantine stations in Europe, exchange and transfer of specimens and of knowledge, greatly facilitated by the pure public good nature of CBC.

Case Study 7
Diamond Back Moth on Cabbage
The Diamond Back Moth (DBM, *Plutella xylostella* (Linnaeus), Lepidoptera: Plutellidae) is the most injurious pest of cabbage in all regions of the world. It is especially serious during warm and dry conditions and often causes complete crop loss. To increase problems further, DBM has developed resistance to almost all synthetic and natural pesticides, and adapts quickly to new insecticides. CBC is thus the approach of choice to control this insect, since

cabbage is one of the most important vegetable crops in tropical Africa and even more so in Asia.

A number of releases of biocontrol agents were allowed by local authorities and conducted according to the internationally accepted rule. In many cases a parasitoid wasp *Cotesia plutellae* (Kurdjumov) (Hymenoptera: Braconidae) proved to be the most effective control agents, and different field trials used different sources for this species: Cape Verde islands received specimens from Pakistan, Togo received its consignment from Taiwan.

The *icipe* introduced a biotype of this species in Uganda and Kenya, while another parasitoid species, *Diadegma semiclausum* (Hellen) (Hymenoptera: Ichneumonidae) was released in several countries of the Eastern and Southern African region. *icipe* was not alone in its efforts and cooperated with local authorities and research institutes all over the world: AVRDC in Taiwan (supply of *Diadegma semiclausum*), PPRI in South Africa (research on *Cotesia plutellae*, supply of parasitoids), KARI of Kenya (participation in baseline surveys, mass production, releases and monitoring of establishment of both parasitoids in Kenya), PHS of Tanzania and NARO in Uganda (baseline surveys, releases and monitoring) and the government extension services of all three countries (farmer training activities). Financial support was granted by the GTZ.

The damage caused by DBM is now economically negligible, pesticide use has dropped sharply and the benefit cost ratio calculated for cabbage production in Kenya alone was 23:1. This is bound to increase substantially as more countries are included in the operations at very little additional cost.

Clearly, a major success factor was the wide cooperation, which could draw on the experiences of many scientists and results from previous field trials. As no ownership and IPR issues were involved, all results were publicly available, and experiences could be shared easily.

4. ACCESS AND BENEFIT-SHARING AND CLASSICAL BIOLOGICAL CONTROL

Classical Biological Control requires quick and legally safe access for researchers to the biodiversity of the countries of origin of the IAS and pest.

History also shows that no country is immune to accidental introduction of invasive species. This general understanding of the threat, and the fact that the management of such problems was always handled by professionals, have produced a culture of mutual assistance among biocontrol specialists worldwide, where free exchange of biocontrol agents was the rule. When biocontrol agents were not known, exploration entomologists were sent to the countries of probable origin of the pest and natural enemies were searched for, mostly in cooperation with local research institutions. Regulation at the international level was introduced when the IPPC issued guidelines on how to proceed with the importation of biocontrol agents (ISPM: International Standards for Phytosanitary Measures by IPPC 2006). These guidelines were adopted by many countries and procedures were put in place in order to prevent unwanted introductions and negative side effects of biocontrol agents.

A number of well-established and well-tested regulations and protocols already exist, developed by partner organizations of the CBD, such as the IOBC and IPPC, to grant and regulate the access to possible biocontrol agents. All countries who joined the IPPC are members to the CBD, and these countries developed administrational structures, being now well in place, to survey and control the introduction of biocontrol agents.

However, we observe with growing concern that the ABS regimes of the CBD interfere with these international regulations, and hinder more than enhance CBC research and its application, thus putting the livelihoods and food security of millions of people in developing countries at risk. We do acknowledge the sovereign rights of the Parties on their biodiversity, however, we regard the strictness and impracticability of much of these regulations against the words and spirit of the CBD itself. In particular, we would like to refer to Articles 1, 5 and 15 of the CBD calling for the cooperation of the Parties, directly or through competent international organizations, to facilitate access to genetic resources for environmentally sound uses by other Parties.

Direct negative consequences of complicated procedures to grant permission for biocontrol research and transfer of material are implicated by the structure of research funding. Currently, all funding of biocontrol research is project-based and has a time frame of three to five years. If the acquisition of the research permit needs a year or more, which has not been a rare case in *icipe's* experience, funding institutions will divert funding to other projects. Scientists, depending on funding for their research and income, turn to other research topics. As a consequence, capacities to combat IAS and pests decline, adding to the brain drain from developing countries, and rendering them particularly vulnerable to the effects of IAS and pests.

5. THE WAY OUT

Classical Biological Control depends on the simple, fast and legally safe access to the biocontrol agents. Long, complicated and expensive procedures to obtain permits do impede research and unduly defer the improvement of the livelihoods of people affected by IAS. Such procedures have the potential to prevent research completely, thereby increasing the brain-drain from developing countries.

We consider these procedure to be not applicable to CBC since in contrast to marketable products which generate constant income for a private company, the biocontrol agents are not modified, genetically engineered or patented and so issues of ownership, intellectual property rights (IPRs) and release of GMO do not apply. Historically, there is no case in which the rights of indigenous people and traditional knowledge have been touch or infringed. All these issues were, with justification, raised in the assumption that a genetic resource would finally become a marketable product. As this is clearly not the case in CBC, regulations can be simplified to facilitate access to genetic resources for the good of the people.

Therefore we hold the view that the current debate on an international ABS regime does not apply to CBC. This being the case, we urge Parties whose national ABS legislation extends to CBC to reconsider this fact as already Parties are already following Article 8(h) with well established protocols and administration in each of the countries, developed by partner conventions to the CBD and in accordance with the CBD, particularly Article 8(h).

We therefore urge the CBD and the ABS negotiations to develop simple, clear, easily implementable and unanimously agreed regulations. These should also be in line with already existing national and international frameworks to the benefit of all stakeholders the local people by improving their livelihoods, and the research institutes, in granting simple and legally safe access to these resources. The aim should be to find practical regulations that promote instead of impeding scientific research and its application to the benefit of human-well being and all Parties.

6. ACRONYMS

ABS	Access and Benefit Sharing	
AVRDC	Asian Vegetable Research and Development Centre	www.avrdc.org
CABI Bioscience	Commonwealth Agricultural Bureaux International	www.cabi.org
CBC	Classical Biological Control	
CBD	Convention on Biological Diversity	www.cbd.int
CGM	Cassava Green Mite *Mononychellus tanajoa* (Bondar), Acari: Tetranychidae	
CIAT	International Centre for Tropical Agriculture	www.ciat.cgiar.org
CIBC	Commonwealth Institute of Biological Control	
CMB	Cassava Mealy Bug *Phenacoccus manihoti* Matile-Ferrero, Homoptera: Pseudococcidae	
CSIRO	Commonwealth Scientific and Industrial Research Organisation	www.csiro.au
DBM	Diamond Back Moth *Plutella xylostella* (Linnaeus), Lepidoptera: Plutellidae	
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation)	www.embrapa.br www.embrapa.gov.br/english
FAO	Food and Agriculture Organisation	www.fao.org
GMO	Genetically Modified Organisms	
GTZ	Gesellschaft fuer Technishe Zusammenarbeit (German Agency for Technical Cooperation)	www.gtz.de
IAPSC	Interafrican Phytosanitary Council	www.au-appo.org
IAS	Invasive Alien Species	
icipe	African Insect Science for Food and Health	www.icipe.org
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics	www.icrisat.org
IIBC	International Institute for Biological Control	
IITA	International Institute of Tropical Agriculture	www.iita.org
IOBC	International Organisation for Biological Control	www.unipa.it/iobc/view.php
IPPC	International Plant Protection Convention	www.ippc.int
IPRs	Intellectual Property Rights	
ISPM	International Standards for Phytosanitary Measures	See ‘Standard (IPSM)’ on www.ippc.int
KARI	Kenya Agricultural Research Institute I of South Africa	www.kari.org
LGB	Larger Grain Borer *Prostephanus truncatus* (Horn), Coleoptera: Buprestidae	
NARO	National Agricultural Research Organization	www.naro.go.ug
PHS	Plant Health Service Tanazania	
PPRI	Plant Protection Research Institute of South Africa	http://www.arc.agric.za/home.asp?pid=376
PTM	Potato Tuber Moth *Phthoromaea operculella* (Zeller), Lepidoptera: Gelechiidae	

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