BioNET 2007-2010 Evaluation

An outcomes evaluation and assessment of the prospects for BioNET to increase its impact on food security, in particular through greater support to plant health systems

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EXECUTIVE SUMMARY

The evaluation examined this taxonomy network of 105 member countries from three angles. First, we focused on what the BioNET Global Programme achieved in 2007-2010 on the level of outcomes – changes in other social actors influenced by BioNET. Second, we viewed these achievements from the perspective of their contribution to food security. Third, we assessed BioNET's contribution to the Convention on Biodiversity. In addition to almost 200 outcomes extracted from reports and interviews with their protagonists, we substantiated outcomes, interviewed authorities and called upon our own expertise and networks of informants.

In 2007-2010, BioNET pursued an ambitious programme to achieve results in four priority areas and we identified a solidly representative group of 187 outcomes that balance the internal progress accomplished in strengthening the network and mobilising resources with the impressive development of taxonomic resources, tools and technologies and contribution to an enabling policy environment. In order to contribute to more outcomes more effectively in those four areas, however, BioNET would need to raise more money.

Fortify the network

One priority goal was to strengthen the operations of the network at the regional level i.e. BioNET's Locally Owned and Operated Partnerships (LOOPs) and well over a fourth of the outcomes do so. BioNET surpassed its aim that the LOOPs be better able to generate technical solutions or respond to enquiries. To varying degrees, they have also been protagonists in a network through which they transcend their national and regional fields of taxonomy and often reach into the global.

The Global Secretariat was notably successful is supporting the development of LOOPs in spite of not being able to hire all the staff as planned due to a lack of funds.

Accelerate the development of taxonomic resources, tools and technologies

There is substantial evidence in the substantiated outcomes from the evaluation that taxonomists of various types (from academic systematic researchers to field practitioners) have been confronted with, educated by and as a consequence better understand end-user needs in developing countries. Thus, the achievement of BioNET has been to demonstrate the importance and relevance of taxonomy in agriculture, from the field problem, to initial diagnosis to identification.

The role currently played by the Global Secretariat hosted by CABI is a critical element in the continuing success of BioNET. That said, the LOOPs have shown they can take initiative and generate national and regional activity too.

BioNET has been the major international player in promoting taxonomy and the dissemination of taxonomic products in the agricultures of developing countries. It is difficult to identify any other organisation or initiative that could undertake this role equally effectively. In plant health regulation, taxonomy is an essential component. It also makes a small but significant contribution to broader-based research and practise in food security. However, the contribution of taxonomists to poverty reduction and food security should not be overstated; they can contribute but only as part of broader agendas.

The "Plantwise" initiative currently being planned by CABI represents potentially a

step-change in their business. By combining an extended system of global plant clinics in strategically-placed countries with the documentation and IT resources and capabilities of CABI, Plantwise could provide a unique service that could also be seen as complementing and enhancing the work of the International CG Centres. Thus, the question arises as to the relationship of the BioNET Global Secretariat with and within Plantwise, particularly in the context of future approaches to donors for funding and/or in terms of relationships with the LOOPs and other partners.

Contribute to an enabling policy environment and communication

During the period under review, BioNET has had significant interactions with many organs of international policy relating to biodiversity conservation and its sustainable use and has brought about a range of significant outcomes that support its intention to "Contribute to an enabling policy environment and Communications".

By far the majority of those outcomes are related to the CBD - as expected. This was the intention of BioNET and SDC and is clearly a positive set of contributions to the programme's objectives. There were very few doubtful outcomes or less than fully established relationships compared to the positive, achieved outcomes.

Amongst the Programmes of Work under the CBD, the most favoured by attention from BioNET was the Global Taxonomy Initiative (GTI) – the major area of expertise of BioNET. It is also the least developed theme in the CBD structure and the one most in need of support. BioNET has had at least some involvement in the major outputs of the UN Year of Biodiversity emanating from the CBD: the 2011-2020 Strategic Plan and its 2020 Biodiversity Targets, the new Protocol of the CBD on Access and Benefit Sharing and PR campaigns to increase awareness and understanding of the significance of biodiversity.

In addition to the CBD, BioNET has also connected to other strands of international policy related to biodiversity through the standard-setting agreements such as IPPC and the SPS of WTO as well as the Ramsar Convention and UN agencies like UNESCO and UNEP.

Few criticisms or negative outcomes have appeared throughout this part of the review. Some LOOPs and Parties have not received the support they would have liked – but this is understandable considering the many demands upon a very small BioNET Secretariat with limited funding. The most meaningful criticism heard was that the BioNET Secretariat is too small, too understaffed and with limited income to achieve its own desired levels of the BioNET Programme Objectives and desired Outputs and so Outcomes.

One disappointing aspect of the enquiries to answer Question 3 was that only 6 Parties mentioned BioNET in their national reporting on the GTI to the CBD in 2004 though we suspect more, particularly developing country authorities, have benefited from the support of BioNET. However, this is in the context of only 25 of over 190 Parties reporting on the GTI at all. This could be due to the frequent change of responsible officers in government agencies.

The future funding and direction of BioNET would benefit from further discussion and consideration with partners outside the remit of this evaluation – as we feel this good work should continue and expand in relation to international policy and the effective use of taxonomy.

Mobilise resources and governance

The BioNET Business Plan and SDC Logframe were overly ambitious. Thus, in spite of doubling its income in 2007-2010 compared to the four years previous, BioNET was unsuccessful in persuading sufficient donors to provide enough funding to carry out the taxonomic capacity building and advocacy work it had planned. In addition to the increase in funding, we recognise that the Global Secretariat has developed a proactive strategic approach in developing a funding profile, rather than only responding to funding opportunities as these arise.

Nonetheless, in spite of the less-than-required level of financing, the BioNET LOOPs were able not only able to take action but as many of 103 LOOP-influenced outcomes demonstrate, they also contributed to important changes in other stakeholders key to the taxonomic impediment and the GTI. But, BioNET is still challenged to enlarge and diversify its funding base.

From our perspective, the principal governance achievement of the BioNET board was seating two representatives of the LOOPs. It is a step towards creating the democratic governance structure that is so vitally important in a network. If members do not feel and have ownership of BioNET, they will not develop. And if the LOOPs do not develop, BioNET and taxonomy for development will not prosper. Continuing to develop in this direction holds the potential for BioNET to empower its members and with that balance the current dominance of the Network by CABI.

Lastly, in our findings – through interviews in particular – it is clear that BioNET's allies recognise the network as the leader in championing the GTI. In fact, the GTI would not have survived without BioNET.

In sum, in 2007-2010 BioNET has had significant accomplishments in all four areas of strategic work and achieved an impressive set of outcomes that strengthen the network, enhanced the ability of taxonomists in 105 countries to respond to end-user needs, and contributed to an enabling policy environment. With the end of direct funding support from SDC - BioNET's global-level core funder and historical sponsor - and SDC's commitment to the Plantwise initiative, the network's stakeholders are at a crossroads and must decide if they will continue to invest in the long-term, autonomous development of the BioNET contribution to human livelihoods.

INTRODUCTION

BioNET - the global network for taxonomy - was established in 1993 to respond to the significant and growing mismatch between the need for, and availability of, taxonomic expertise and services in developing countries. A Secretariat was set up in the UK by the Centre for Agricultural Bioscience International (CABI), an international not-for-profit organization. In 1995, the Swiss Agency of Development and Cooperation (SDC) provided a 10-year grant to the BioNET Fund (the financial mechanism managed by CABI in the United Kingdom for BioNET) to support the Secretariat and the establishment of regional BioNET government-endorsed Locally Owned and Operated Partnerships (LOOPs). Its LOOP Coordinating Committee governs the finances and operations of each BioNET LOOP. The result is a loose network of autonomous and voluntary actors whose dynamic revolves around their regional LOOP on the one hand, and on the other around the Global Secretariat linking the regional LOOPs with international technology, informatics, capacity building and policy partners. SDC has continued to provide support to the Secretariat and other components of BioNET. The 2004 External Review of BioNET (McNeely *et al*., 2002) was largely positive about BioNET (at both HQ and the newly-established LOOPs) but that was quite a long time before this present review. It maintained that BioNET had established a useful and helpful position in relation to the CBD despite the small staff in its Global Secretariat. Currently, the major sponsors of the Secretariat-led BioNET Global Programme 2007-11 are SDC, the Swedish International Biodiversity Programme and the European Union. National and regional institutions and a diverse array of funders further support LOOP activities

Consequently, SDC and BioNET agreed to commission a summative evaluation of the results of the BioNET Global Programme 2007-10 and the added value of SDC's contribution (Annex 2 –). It was decided that special emphasis would be given to two pieces of the BioNET Global Programme. The evaluators would assess the prospects for BioNET to increase its impact on food security, in particular through greater support to plant health systems, and to examine the potential of BioNET to contribute to and benefit from CABI's Plantwise initiative.

The primary intended *users* of this evaluation's findings are SDC, CABI, the BioNET Board and Secretariat. The broader audience includes the BioNET LOOPs, the Secretariat of the CBD, collaborating organizations and other funders.

The evaluation team consists of lead evaluator Ricardo Wilson-Grau, an expert in network evaluation working as a consultant and located in Rio de Janeiro; co-evaluator Geoffrey Howard, an expert in biodiversity with IUCN, based in Nairobi; and co-evaluator Dr. Mike Jeger, plant health expert and consultant, *pro bono* member of the informal CABI Plantwise advisory group, Imperial College, University of London. Our collective role has been to ensure the process was a systematic, data-based inquiry that answered all the evaluation questions.

Evaluating an international network

Assessing the results of BioNET requires taking into account three characteristics that BioNET shares with other international networks.

High degree of unpredictability. The environment in which the Global Secretariat and the LOOPs operate, and they themselves, are characterised by *complexity*: open, dynamic and unpredictable interaction and interdependence between numerous actors and factors in over 100 countries. Consequently, when BioNET contributes to an outcome, the effect may be direct but is often indirect, partial, and even unintentional. It generally occurs sometime after the BioNET activity, which is usually in concert with other initiatives of the LOOP members or of other taxonomic actors. Thus, only sometimes is there a linear, cause-effect relationship between what the Global Secretariat or the LOOPs do and their outcomes. In sum, as in similar international networks, outcome causality for BioNET is messy, multi-level and multi-directional, as well as unpredictable.

Autonomous, voluntary and diverse membership. The 10 regional LOOPs plus two in formation and their 105 national members in Africa, Asia and Latin America and the Caribbean (Annex 3) are all comprised of independent institutions that participate in BioNET of their own free will. Thus, in contrast to the people involved in other types of organisations, and especially in the educational, research and extension institutions that are members of BioNET, the LOOP coordinators and technical secretaries are not paid employees of BioNET and the regional and national coordinating institutions do not depend on BioNET for funding. Furthermore, the member institutions and their representatives have a diversity of motivations and resources and varying levels of commitment. Consequently, as in any network, there is a constant tension between, on the one hand, members expecting to set the agenda through democratic decision-making and participation in BioNET activities and, on the other, the inappropriateness of the management common in government, business, academia or broader civil society.

Conventional expectations: At the same time, network stakeholders tend to expect their network to function in the same way that they are accustomed to working in their home institutions. Consequently, BioNET's stakeholders, especially donors but also the BioNET board, CABI, and the regional coordinating institutions and their representatives, may conceptualise evaluation in a way that, frankly, clashes with the reality of networks. For example, the conventional approach is to compare results to an original logical framework analysis, assuming a causal chain of inputs ➔ activities ➔ outputs ➔ outcomes ➔ impact. The outcomes are predefined SMARTly in specific, measurable, achievable, realistic and time-bound terms and the schedule of inputs, activities and outputs to be achieved are predetermined.

The BioNET Business Plan did not predefine SMART outcomes but the operational plan, from which the SDC Logframe was developed, defined outcomes with specific, measurable and time-bound objectives (activities, milestones, responsibilities). The Global Secretariat explains, however, that when it became clear that the fund raising objective would not be achieved, the activities described in the operational plan were re-prioritised. The annual work plans for the Global Secretariat were adapted accordingly. Thus, rather than being tied down to an elaborate predetermined plan to pursue predefined results, and immersed in a reality that is highly dynamic and unpredictable, BioNET innovated, as most international networks must do.

Therefore, in the main body of the evaluation, we do not follow a conventional assessment of what was achieved against what was planned. BioNET stakeholders must understand that if we had done that, unforeseen (positive and negative) outcomes to which its diverse actors contribute would easily have been overlooked. Still, in the conclusions of this evaluation we do compare the outcomes achieved to what we

perceive as the outcomes intended in the Business Plan and SDC Logframe (Annex 4).

Evaluation methodology

In the light of their primary intended uses, SDC, CABI and the BioNET Global Secretariat and we evaluators agreed on an evaluation design (Annex 5) to generate findings that would enhance their understanding of the merit and worth of the results actually achieved by the Global Programme in 2007-2010 on the level of outcomes, intended and unintended. That is, the evaluation is about the accomplishments of the BioNET Global Programme rather than its performance in terms of activities and outputs.

Thus, the predefined objectives in the BioNET Business Plan 2007-2011 and the objectives and outcomes in the SDC 2008-2011 Logframe are the primary frame of reference for understanding the almost two hundred representative but not exhaustive outcomes achieved in 2007-2010.

Outcomes not impact

Although BioNET aspires to support biodiversity conservation, food security, poverty alleviation, and animal, plant and human health, we purposely did not set out in this evaluation to determine BioNET's *impact*[1] in these areas. The reason is simply that what BioNET does will contribute to these types of changes, in IDRC's words, "via long, busy, discontinuous pathways… [in which] tracing the connections is at best unreliable and at worst impossible."[2]

Instead, we decided to focus on generating evidence and assessing the merit and worth of BioNET's outcomes: results within BioNET's sphere of influence but downstream from the activities and outputs which BioNET controls while upstream from impact. Adapted from the Outcome Mapping methodology developed by the Canadian International Development Research Center, outcomes are observable changes in the behaviour, relationships, activities and actions of individuals, groups, organisations or institutions that verify qualitative and quantitative progress towards the objectives in the BioNET Business Plan 2007-2011 and in the SDC 2008-2011 Logframe.[3] To qualify as an outcome, the change had to have been influenced in a small or large way, directly or indirectly, intentionally or not by BioNET.[4]

To focus on outcomes instead of impact was one important decision for this evaluation.

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1 Definitions for "impact" in international development vary little. They range from the World Bank's "long-term, widespread improvement in society" and the OECD's "longer term or ultimate result attributable to a development intervention" to the UNDP's "long-term and national-level development change" and the Gates Foundation's "ultimate sustainable changes, sometimes attributable to action."

2 Sarah Earl, Fred Carden, and Terry Smutylo Outcome mapping: building learning and reflection into development programs, IDRC, 2001, page 17. See http://www.idrc.ca/en/ev-26586-201-1-DO_TOPIC.html.

3 The Canadian International Development Research Centre (IDRC) developed this definition of outcomes about ten years ago. Subsequently it has become widely used by development and social change programmes. See http://www.idrc.ca/en/ev-26586-201-1-DO_TOPIC.html and the Outcome Mapping Learning Community website at www.outcomemapping.ca.

4 "While, at first glance, this appears to suggest concentrating on easier, less important, short-term achievements, in fact it does the opposite. It focuses attention on incremental, often subtle changes, without which the large-scale, more prominent achievements in human well-being cannot be attained or sustained." Sarah Earl, et al, op. cit., page 21.

Another was not to assign *attribution* understood as "isolating the key factors that caused the desired results and attributing them to a particular agency or set of activities."[5] Why? As IDRC explained ten years ago in its rationale for its Outcome Mapping methodology:

> *…experience tells us that development is a complex process that takes place in circumstances where a program cannot be isolated from the various actors with which it will interact (for example, other donors, partner organizations, government departments, communities, organizations, and groups within the community). Nor can it be insulated from the factors by which it will be influenced (these include social, political, cultural, economic, historical, and environmental factors).*[6]

Therefore, we agreed we would seek to identify causality in BioNET's activities or outputs *contributing* in a small or large way, directly or indirectly, and intentionally or not to the outcomes.

To focus the evaluation, we agreed on *four evaluation questions* (Annex 2 –) and divided them up amongst the three evaluators: Ricardo Wilson-Grau was responsible for evaluation questions 1 and 4, Mike Jeger for 2 and Geoffrey Howard for 3. Nevertheless, we all read and critically discussed each other's work and we share the conclusions and recommended points for discussion.

As would be expected in an outcomes evaluation, the outcomes achieved by the BioNET Secretariat and LOOPs serve as basic evidence for the answers to all four questions. These were generated through a review of the reports and additional information on file at the BioNET Secretariat, consultations with the Global Secretariat team and the coordinators of all the regional LOOPs and selective substantiation with third parties of outcomes selected by us. Complementary information, especially for the 2nd and 3rd evaluation questions was obtained from other written and oral sources. The specific criteria, standards and information gathering process, as well as the analysis and interpretation of the data, is explained in the chapter devoted to each evaluation question.

Methodological challenges, validity and credibility

Outcomes evaluation is not a process of scientific research "undertaken to discover new knowledge, test theories, establish truth, and generalize across time and space. Outcome evaluation is undertaken to inform decisions, clarify options, identify improvements, and provide information about programs and policies within contextual boundaries of time, place, values, and politics… Research aims to produce knowledge and truth. Useful evaluation supports action."[7] This distinction was especially important in this evaluation because virtually all the informants and two of the evaluators are scientists.

Although the *criteria* are different *for evaluations*, they are no less rigorous than for scientific research. In the evaluation, we were guided by the four standards of evaluation of the American Evaluation Association, which are fairly well accepted world-wide:

5 Sarah Earl, et al, op.cit., page 21.

6 Sarah Earl, et al, op.cit., page 18.

7 Michael Quinn Patton, Developmental Evaluation, Guilford Press, 2010.

i) *Propriety:* Ensure that the evaluation is conducted legally, ethically, and with due regard for the welfare of those involved in the evaluation, as well as those affected by its results.

ii) *Utility:* Ensure that the evaluation serves the information needs of intended users.

iii) *Feasibility:* Ensure that the evaluation is realistic, prudent, diplomatic, and frugal.

iv) *Accuracy:* Ensure that the evaluation reveals and conveys technically adequate information about the features that determine worth or merit of the program being evaluated.

Another challenge that we faced was that the *concept of "outcome"* we used in this evaluation was relatively new to BioNET. The notion of outcomes as changes in other social actors influenced by BioNET began to be introduced in late 2010 to the BioNET Global Secretariat and the ASEANET and African LOOPs. Nonetheless, for all of them and of course especially for the other LOOPs, it was a steep learning curve.

The *participatory methodology* demanded days of time from Richard Smith, John Mauremootoo and Kornelia Rassmann of the Global Secretariat, and hours of time from the regional coordinators who serve BioNET in a voluntary capacity. The evaluation's demands were in addition to all of these informants' heavy workloads. In addition, we were on a very tight time schedule to finish the evaluation process within three months that extended over the end-of-year holidays. Nonetheless, only one regional coordinator was unable to engage with us in the exercise. We were equally successful with the contributions from the substantiators. On average, two out of three individuals with a working knowledge of the outcome that we requested they substantiate did so.

When developing the evaluation design we consulted with the primary intended users in BioNET, CABI and SDC to ensure that even though the sources for most of the outcomes were internal to BioNET, this information would be sufficiently valid and credible for their uses. Specifically, they accepted these points in favour of *validity*:

i) The BioNET actors reporting were the people who contributed to the outcomes.

ii) We evaluators examined the outcomes for a plausible rationale between what was reported as achieved and the reported contribution of BioNET.

iii) The informants formally went on public record with outcomes that could be subjected to verification by us as external evaluators.

Nonetheless, evaluation in general, and identifying and formulating outcomes in particular, does have a strong element of subjectivity. Evaluation is as subjective (or objective) as the information on which it is based, as is the case of evidence for anything. The important question, therefore, is if the evidence we collected is not only valid but also credible. The issue is not only if there has been a change and the degree to which a BioNET action contributed to the change in some measure. Equally important is who makes that judgement. Consensus over what actually happened, how, when and where and how BioNET contributed is very difficult to achieve, as with the subject of any evaluation.[8] Also, most outcomes did only have one source – BioNET.

For these reasons, we agreed on a random "substantiation" of the outcomes in a way that would enhance their *credibility*.

8 Chris Roche, Impact Assessment for Development Agencies, Oxfam, 1999, page 267.

iv) Once the outcomes were formulated, we evaluators selected a dozen for which we asked their authors for fuller formulations. Ten of the twelve were formulated in time. Then we subjected these select outcomes to an additional step of "substantiation". We communicated by email with up to three third parties per outcome who went on record with the degree to which they agree – fully, partially or not at all – with the outcome, its significance and BioNET's contribution. In the end, seventeen third parties substantiated all ten outcomes (Annex 6). Two other substantiators declined to comment because one felt a conflict of interest and the other did not have knowledge of the outcome. Fifteen substantiators fully agreed with the description of the outcome but two only partially. All seventeen substantiators fully agreed with the significance and contribution of each outcome.

The substantiation of course gives an additional dimension of credibility to the outcomes. Closing the circle, the *validity* of the substantiation resides in:

- The authority, independence and absence of a conflict of interest of the person in relation to the outcome they are substantiating.
- Their going on record publicly with their agreement or disagreement with the outcome as formulated.
- An average of 1.7 people substantiated each outcome.

In addition, and equally as important, the evaluators undertook independent verification of a number of outcomes where that information was available. They found no contradictions.

In sum, the evaluators consider the outcomes valid as formulated.

It has become customary for evaluations to include *recommendations* and certainly from the beginning through the discussion of the draft evaluation report, there was the expectation that we would recommend what BioNET should do. As evaluators, we have been and continue to be very cautious about making recommendations because we consider they are generally inappropriate.

An excellent evaluation will draw reasonable conclusions from solid evidence. We evaluators must ensure that sufficient high quality data is gathered and then well formulated. It must be plausible and verifiable. Then, we must accurately interpret and make judgments about the relationships between all the data in order to answer each one of the evaluation questions —that is, draw conclusions based on evidence. This is an awful lot to get right. Often the findings and the conclusions will be on the cutting edge and lead to substantial discussion by the primary intended users, as was the case with the discussion of the draft of this evaluation report.

To take the next step and recommend what decisions or action SDC and BioNET should take, is an unreasonable expectation of an evaluation team. Why? Well, surrounding both SDC's and BioNET's decision-making are entirely legitimate political, legal, public-perception, financial, programmatic, and ethical considerations, most of which will be confidential or highly sensitive or both. We as evaluators will not, and correctly should not, have access to this information. Each one of these factors alone, and especially when combined, will be at least as important as the findings and conclusions of the evaluation when the primary intended users make decisions about what to do and not do. Said another way, if we did our job right, CABI, SDC and BioNET now have solid evidence and expert interpretations of it that will permit you to combine with everything else that needs to be considered to make the best judgments.

This said, we certainly recognise as evaluators that we may have something valuable to contribute to discussion about what to do with the findings and conclusions of our evaluation. One contribution is the points of discussion that we suggest you address. Another would be to accompany you in that discussion, although it was not included in the terms of reference because of resource limitations.

In the next chapter, we will answer the first evaluation question.

EVALUATION QUESTION #1 – THE MEANING OF THE OUTCOMES ACHIEVED BY THE BIONET GLOBAL PROGRAMME[9]

> *What do the outcomes achieved by the BioNET Global Programme since 2007 imply for how that programme should do things differently in order to contribute as effectively as possible to outcomes that (a) fortify the operational platform (LOOPs), (b) accelerate the development of taxonomic resources, tools and technologies, (c) contribute to an enabling policy environment and (d) mobilise resources.*[10]

In this chapter, first we explain how we obtained the 187 outcomes. Then, we address BioNET's effectiveness in fortifying the operational platform. We also address resource mobilization for taxonomy, governance and monitoring and evaluation, all of which are objectives under d). Points b), c), and the part of d) concerning resource mobilization for BioNET are the subjects of the other three evaluation questions. We draw general conclusions about them at the end of this report.

Identifying, formulating and substantiating 187 outcomes

From late November to mid-December, we extracted from all the documents on file at BioNET that could possibly contain outcomes to which the Global Secretariat or a LOOP contributed (Annex 7 – BioNET documents consulted for outcomes 2007-2010) one sentence draft descriptions of the outcome and BioNET's contribution. We found 93 potential outcomes in the Global Secretariat documents and just about the same number for eleven of the LOOPs, including the unofficial LATINET. We had a range of questions concerning specificity (numbers and dates mainly), doubts about whether a reported change was an output or an outcome and if and how BioNET contributed. The Global Secretariat then reviewed, corrected and augmented the outcomes. We realised that our initial division of outcomes into those generated by the Global Programme and those by a LOOP was not helpful because so many, especially but not exclusively at the LOOP level, were influenced by the Global Secretariat, and to a lesser but still significant extent vice-versa.

The Global Secretariat also classified the outcomes according to the agreed 13 Global Programme objectives. Creatively, Konny Rassmann and her colleagues in the Global Secretariat enriched the initial classification with sub-categories. This, along with the outcomes the Global Secretariat subtracted and those it added are important indicators

9 Ricardo Wilson-Grau was primarily responsible for this chapter.

10 From the BioNET Business Plan 2007-2011 and SDC 2008-2011 Logframe.

that we have not fallen into the categorisation trap.[11]

Beginning in mid-January, we sent all the outcomes that corresponded to each LOOP coordinator, including those in their region and those in which the Global Secretariat had been involved, for them to review, correct, subtract the dubious ones, and add new ones. As with the Global Secretariat, we reviewed the outcomes for substance and coherence. In the end, we identified 84 outcomes from the Global Secretariat and 103 from the LOOPs (Annex 8).[12]

I had also asked the LOOP coordinators to classify their outcomes but quickly realised that this would not work – there were both serious delays in responding and when they did, large discrepancies between their classification and that of the Global Secretariat. The evaluators agreed to proceed with the classification by the Global Secretariat. In the end, as we worked with the outcomes we evaluators decided their final classification. See Annex 9 and Annex 10.

Table 2 – BioNET Outcome 2007-2010 by the four key areas of work

Global Programme's Four Key Areas of Work[13]	TOTAL
A − Fortify the operational platform (LOOPs)	28%
B – Accelerate the development of taxonomic resources, tools and technologies	25%
C – Contribute to an enabling policy environment and communications	17%
D – Mobilise resources, governance and monitoring and evaluation (M&E)	30%

Taken together, the almost two hundred outcomes represent accomplishments in the four areas of BioNET's work in 2007-2010 that are rich and respectably even (**Error! Reference source not found.**).

Before examining the overall achievements in each area of work, it is important to underline the limitations of the 187 outcomes harvested for they are not the complete picture of what BioNET has accomplished, especially at the regional LOOP level. The reasons are varied. The basic sources for the outcomes were semi and annual reports that were written without the concept of outcomes in mind. Unreported outcomes that were identified as we did the exercise depended on the memory, usually of one person. If more people had been involved, more outcomes would have been identified. In addition, there is the double bind of negative outcomes. Influencing a social actor not to take action – avoiding something undesirable from happening – can be a significant outcome but is often awkward to formulate as a change. In addition, there may be outcomes that could be considered as negative changes to which a counterpart

11 "Here is the major danger with categorization: if you give a group of decision makers a categorization framework (the ubiquitous consultancy two by two is a classic case) with a data set that only partially fits the framework, then they will only see those aspects of the data set that match the framework; this is called pattern entrainment. The capacity to see novelty or detect weak signals is thus reduced in categorization models in compensation for which consistent execution of appropriate responses to the categories is improved." See Snowden, D. (2005). "Strategy in the context of uncertainty." Handbook of Business Strategy 6(1): 47-54.

12 Throughout this report, outcomes are identified by [numbers] in brackets.

13 An integration of the four "key areas of work" in the BioNET Business Plan 2007-2011 and the "Objectives" in the SDC 2008-2011 Logframe13

inadvertently contributed and which significantly detract from, undermine or obstructs a desirable result. We strove to identify negative outcomes but understandably, they are underreported, at least in the written sources.

For all these reasons, the evaluators considered that the outcomes we harvested, while not exhaustive, are representative of BioNET's achievements in 2007-2010. Now we will examine the outcomes from the perspective of what BioNET set out to achieve in 2007-2010.

Fortify the operational platform (LOOPs)

Here we present our assessment of the 52 outcomes that correspond to the two objectives (Table 3).

1. Strengthening the LOOPs

The 41 outcomes that correspond to the first BioNET objective are divided into four sub-objectives. BioNET in a dozen instances influenced internal and external actors to change their behaviour, relationships, actions, policies or practices in ways that contribute to *building LOOP structures and local support* for BioNET.

Table 3 – Number of outcomes that fortify the LOOPs

Global Programme Categories of "Objectives" in the SDC 2008-2011 Logframe	TOTAL
1. Strengthen the LOOPs so they can increase the quality, quantity and sustainability of locally-optimised taxonomic responses to user needs for LOOP member countries and LOOP client institutions.	**41**
1a – Build formal loop structures and obtain local support	12
1b – Maintain and increase BioNET participation and ownership	17
1c – Recruiting of BioNET 'members'	4
1d – Build relationships with other organizations and networks	8
2. Develop the capacity, business models and operational support of LOOPs needed to respond in a timely manner to market needs.	**11**

The nature of these outcomes ranged from Cuba [Outcome 173] and Mauritania [113] endorsing BioNET in 2009 and 2010 to local institutions in Benin [98], Tunisia [112] and South Korea [198] stepping up to second staff to serve as LOOP coordinators or offering to serve as coordinating institutions for the LOOP. In Japan [1] and China [2] steps are being taken by institutions interested in taxonomy to become more involved in BioNET, and the Pacific Regional Environment Programme is proposing to allocate time to collaborative activities with BioNET [185].

[173] In 2009, The Cuban Government formally endorsed BioNET, becoming the 104th country to do so.

In cooperation with interim-BioNET Cuba Coordinator Julio Mena-Portales of the Institute of Ecology and Systematics, Richard Smith responded in writing to questions from the Cuban authorities in 2008.

Not all was positive, however, and the Global Secretariat reports in 2010 that in spite of

its efforts, momentum in some LOOPs has faltered. MESOAMERINET has not been established despite a formulation workshop and submission of a proposal to governments of the region; SACNET, EASIANET and PACINET lack a regional coordinating institute/coordinator, and twelve national coordinator positions remain vacant [3]. In the Southern Cone of South America, in spite of the lack of a coordinating institution, one taxonomist has taken on the ad hoc responsibility herself to promote LATINET [123].

Almost half again as many outcomes *bolstered participation and ownership* in the LOOPs. Here is where the amalgam of Global Secretariat and local initiatives blossomed. The achievements were diverse but three clusters of outcomes reflect their scope and weight:

1. The East Africa BioNET (EAFRINET) demonstrates the dynamism that comes from the £353,600 earmarked for the UVIMA project. Started in November 2008, the 2.5 year UVIMA (Swahili acronym for taxonomy for development in East Africa) project strives to consolidate and mobilize existing taxonomic information for generating tools and products relevant to the environmental, food and poverty crises in Africa. Some 8% of all BioNET outcomes in 2007-2010 are directly related to UVIMA. Amongst UVIMA's many outcomes, a set correspond to outcomes that have strengthened EAFRINET as a delivery platform for the meeting of end-user taxonomic needs.

   For example, the Global Secretariat has used UVIMA funds to provide management and technical support for EAFRINET regional and national coordinators who as a result are noticeably more committed and active, taking initiatives such as agreeing annual plans and recruiting alternates to support the LOOP. [9] Also, UVIMA funds have sparked a decision by the National Museums of Kenya, the regional coordinating institution, to co-finance the construction of an office for the network and several meetings aimed at network strengthening in 2009 and 2010 [137].

[196] The Asia-Pacific Biodiversity Observation Network decided to include the 21 Pacific Island Countries and Territories in this largely Asian dominated network in 2009 and supported the participation of a young local scientist to attend meetings.

Partnering with like-minded networks, institutions and individuals helps in raising the profile of taxonomy and the Network. PACINET is the only Pacific based body that coordinates the collecting, collating and disseminating of biodiversity data for the Pacific Islands.

2. In South America, the ad hoc coordinator who operates without a government mandate for BioNET and much less a project budget, achieved a variety of outcomes that potentially will lead to BioNET recognition by governments in the Southern Cone. Dozens of taxonomists from Argentina, Brazil, Chile, Colombia, Cuba, Peru and Uruguay met for the first time to discuss creating a regional network and agree a strategy to engage governments [121]. And in Argentina,

[4] In the survey and LOOP Workshop 2009 – both first of a kind activities - BioNET coordinators for the first time supplied collective positive feed back to the support the BioNET Secretariat provides to the LOOPs, with a large majority of the 19 LOOP survey respondents agreeing that: (a) the Global Programme is highly relevant to their work and that their LOOP benefits from the support of the Secretariat; (b) BioNET's global and regional networking and information sharing is widely valued by BioNET coordinators.

The 2009 survey and LOOP workshop were organized by the BioNET Secretariat.

the national association of taxonomists was founded [126].

3. In addition to the regional support for these outcomes, the BioNET Global Secretariat contributed to a number of additional outcomes that fostered LOOP participation and ownership. The Secretariat created the "LOOP corner" on the website [7] and stimulated a 39% increase in the new subscribers to the BioNET bulletin since 2007 bringing the total to over 2000 today [10]. LOOP coordinators and Secretariat met for the first time in mid-2009, when the LOOPs formally recognised the vital role of the Secretariat [4], agreed a common "roadmap" to guide the work of the network [5], an outcome that was substantiated by Kamal Bawa, Director, Ashoka Trust for Research in Ecology and the Environment. Finally, the Secretariat promoted LOOP representation on the BioNET Board.

Relatively few outcomes were reported concerning the *recruitment of BioNET members*, but eight were registered in *building relationships with other organisations and networks*. BioNET leaders were invited to engage with a number of leading taxonomic actors, including the Scientific Advisory Committee of the European Distributed Institute of Taxonomy (EDIT) [13], the Consortium of European Taxonomic Facilities (CETAF) [14], the German organization Full Biodiversity Monitoring Transect Analysis in Africa (BIOTA) [152] and the Asia-Pacific Biodiversity Observation Network [196]. In addition, a number of equally key taxonomic institutions have contributed[14] to and disseminated[15] BioNET initiatives [15].

2. Develop LOOPs capacity to respond to demand

While the eleven outcomes that correspond primarily to this objective are positive signs of new capacities in different aspects of the network, they do not reveal a pattern of development of LOOP capacity within BioNET, except for SAFRINET to which half the outcomes refer. That is, that the African LOOPs show interest in P&ME [97] is a positive step forward but is not evidence that the LOOPs as a whole are planning, monitoring and evaluating their work using a common set of principles. Similarly, that EAFRINET developed a strategic plan [161] and PACINET a business plan [188] are significant achievements but not the same as the LOOPs as a whole producing strategic plans.

[16] The BioNET Board agreed in August 2009 to allocate resources to the recruitment of Regional Partnership Officer, John Mauremootoo which allows the Secretariat to very significantly strengthen LOOP liaison, networking and outreach, improve the support for prioritization and enhancement of taxonomic product delivery, strengthen support for project development and implementation, increase the regional and global presence of LOOPs and support development and enhance the implementation of LOOP governance and the development and implementation of M&E.

BioNET Secretariat and the LOOPs articulated the need for this position in the business plan 2007-11 and at the LOOP workshop 2009.

Of them all, arguably the most important

14 For example, the Natural History Museum of Denmark, ArtDatabanken/Swedish Species Information Centre, African Insect Science for Food and Health (ICIPE), Natural History Museum, London, Royal Belgian Institute of Natural Sciences contributed material to the BioNET presentation "Taxonomy – Understanding the world around you".

15 And these institutions disseminated the presentation: UNEP, EDIT, International Institute for Species Exploration IISE, Royal Belgian Institute of Natural Sciences, and the Tel Aviv University Natural History Museum.

for strengthening the capacity, business models and operational support of the LOOPs was the BioNET Board's decision in August 2009 to allocate resources to the recruitment of Regional Partnership Officer (RPO) and John Mauremootoo was hired [16].

Two LOOP coordinators – Mohamed Elyes Kchouk of NAFRINET and Muaka Toko of WAFRINET fully substantiated this outcome (see Annex 6 – Substantiation of ten outcomes selected by the evaluators). Muaka Toko proposes, "funding be sourced for the recruitment of the other two RPOs with the hope to boost the activities of BioNET as a whole."

Related to this outcome was one of the few negative outcomes registered:

> *[17] In order to make work planning more efficient and learn from experiences and lessons in other LOOPs, the BioNET Secretariat provided the newly developed work plan model prepared by PACINET to two LOOPs; however they did not use or adapt the PACINET work plan and a subsequently revised and harmonized work plan template has not yet been introduced to the LOOPs.*

The explanation given by the Global Secretariat for this non-action was that the Secretariat needs not only to provide LOOPs with model planning documents but also work with them to produce plans adapted to each region. One RPO cannot adequately support all ten LOOPs and there is not yet funding available to hire the other two. This budget restriction did not completely cripple the LOOPs, however. The first full time PACINET Coordinator Gilianne Brodie wrote the first ever business/strategic plan for the LOOP and published the LOOP's first work plan, inspiring the BioNET Secretariat to incorporate elements of it into a "model work plan" for adaption by other LOOPs [188].

Resource mobilization for taxonomy

[80] During the May 2008, 9th Conference of the Parties the Convention on Biological Diversity decided to renew BioNET's mandate as the leader of an initiative that aims to establish a special fund for the GTI.

In May, 2008 BioNET's secretariat had made a proposal to the Coordination Mechanism to establish a global partnership for Taxonomy to establish and maintain a trust fund.

Although only four outcomes were registered, each one was classified as important for the *establishment of the Global Taxonomy Partnership (GTP)*[16] *and the implementation of the Global Taxonomy Initiative* of the CDB. In May 2008, BioNET's mandate as leader of the initiative to establish a special fund for the GTI was renewed by the Convention on Biological Diversity [80]. This was followed by the National Museum of Natural History in Paris hosting a workshop in Paris in June 2009 at which an array of important taxonomy, policy and communications actors made multiple commitments to the GTI Special Fund / GTP initiative [81].

16 Coalition of stakeholders in the Global Taxonomy Initiative working towards more sustainable funding for the GTI. See Evaluation Question 3 for a full explanation of the GTI.

Table 4 – Outcomes that improve governance, monitoring and evaluation in BioNET

Global Programme Categories of "Objectives" in the SDC 2008-2011 Logframe	TOTAL
11. Establish the Global Taxonomy Partnership (GTP) to support BioNET's mission and implementation of the Global Taxonomy Initiative.	4
12. Adapt BioNET's governance to be representative of core customer interests and allow flexible responses to emerging opportunities.	4
13. Enhance M&E to allow strategic management decisions and increase participation and ownership	3

BioNET governance and monitoring and evaluation (M&E)

The four outcomes that evidence progress towards the goal of BioNET's *governance to be representative of core customer interests* were somewhat less dramatic but relatively as important. A former chair of the GBIF Science Committee and CETAF joined BioNET's Advisory Group [84] as the Board decided to expand its membership [85], including for the first time two LOOP representatives as members [86]. Regarding this outcome, the views of the BioNET chair, Chris Lyal, are important:

[86] In June 2010 the BioNET Board welcomed two LOOP representatives as members, the first time LOOPs have been represented on the Board.

LOOP participants at the 2009 One BioNET LOOP Workshop requested that the Board be expanded to include LOOP representatives; four nominations were received from the LOOPs and LOOP Coordinating Committee members engaged in an internet based voting process.

> *"The original decision by the Board to invite LOOP members in rotation did not anticipate the interest and real commitment by the LOOPs in participation in an election process. We anticipate in a few years we may wish to revisit the terms of the LOOP representation and its 'rotation'….*
>
> *"The presence of LOOP members at the last Board meeting was very helpful both from their contributions (individual and on behalf of other LOOP members) and the clear increased sense of ownership on a wide scale that it provided. The process has clearly increased the LOOP interest and involvement in the Board and the Network as a whole….*
>
> *"The Secretariat's actions have been critical, and demonstrate the importance of having this component of the BioNET model."*

The last objective with 3 outcomes was the *enhancement of Monitoring and Evaluation (M&E)* to allow strategic management decisions and increase participation and ownership. The commitment materialised in the creation of a special section of the website [89], recognition of Outcome Mapping as a valuable tool in BioNET's planning, monitoring and evaluation [90] and workshops with ASEANET and EAFRINET members in 2010 highlighting Outcome Mapping.

Synthesis

1. BioNET has been successful in achieving results in all four areas of work proposed for 2007-2011. Well over half of the outcomes achieved have principally strengthened the network. This is vitally important since a network is not the sum of its parts but a product of their interaction. Nonetheless, BioNET managed the

danger of becoming too inward looking precisely because of the importance of developing the network itself. The internal progress registered by BioNET was achieved without sacrificing focus on the ends for which BioNET is a means, where over 40% of the outcomes were registered (Key Areas B & C, Table 2). That said, BioNET in the period has only been able to raise and therefore work with one-half the funds originally planned.

2. In order to contribute outcomes more effectively in those four areas, BioNET would have to raise more money in order to be able to implement more fully and swiftly its strategy and achieve its ambitious but necessary goals. The prime indicator is that only one rather than three partnership officers are in place as BioNET enters the fifth and last year of its Business Plan. All signs in the outcomes are that the one officer is doing a much appreciated and effective job; nonetheless, it is one third of what BioNET itself believes it needs to "strengthen the LOOPs so they can increase the quality, quantity and sustainability of locally-optimised taxonomic responses to user needs for LOOP member countries and LOOP client institutions", no less!
3. The appointment of two LOOP members to the board is the beginning of creating the democratic governance structure that is so vitally important in a network. One of the critical keys to success in a network is democratic participation, as only makes sense since all the members are autonomous organisations who have voluntarily joined forces in a common cause. If members do not feel and have ownership of BioNET, they will not develop. In addition, if the LOOPs do not develop, BioNET and taxonomy for development will not prosper.

EVALUATION QUESTION #2: TO WHAT EXTENT AND HOW DO THE OUTCOMES OF BIONET REPRESENT A CONTRIBUTION, OR POTENTIAL CONTRIBUTION TO IMPROVED FOOD SECURITY / AGRICULTURAL RESEARCH FOR DEVELOPMENT, AND IN PARTICULAR A POTENTIAL ROLE IN CABI'S PLANTWISE INITIATIVE?[17]

Importance of taxonomy for agricultural research for development

A recent publication identified the 100 most important questions for global agriculture, following a horizon-scanning approach involving leading experts and representatives of major agricultural organizations worldwide (Pretty et al., 2010). The goal of agriculture was interpreted not simply to maximize productivity but to optimize across a multi-faceted landscape including biodiversity, ecosystem services and conservation. In none of these questions did taxonomy feature explicitly as an issue. That is the context in which the issue of the contribution of taxonomy and taxonomic products to agricultural research must be seen, despite the claims on its value to agriculture and biodiversity more generally (Lyal et al., 2008).

Agriculture it has long been claimed must have its foundation in biological systematics (Small, 1993), i.e. in taxonomy. However, there continues to be considerable lack of

17 Mike Jeger was principally responsible for the answers to this question.

appreciation over its contribution and economic value. In the context of plant genetic resources, for example, there is a need for not only continuing investment in the developed countries but also a massive investment in developing countries that has not been forthcoming. The role of the Germplasm Resources Network (GRIN) of the USDA has provided an invaluable resource for agriculture and other plants of economic importance not represented in germplasm collections throughout the world. Such taxonomic information becomes invaluable when assessing the potential of unexploited plant genera for their commercial use.

The need for taxonomic support has been shown for many taxa where there are particular taxonomic problems or ambiguities, as with plant pests, biocontrol organisms and other organisms beneficial for plant health. With arthropods, in most developing countries there is a lack of capacity to identify species and keep up with changing nomenclature, and a failure to preserve and maintain specimens over time. With plant pathogenic organisms, there are inherent problems in diagnosis and detection, making the requirement for culture collections representative of the target organisms, and their genetic diversity, essential. This however presents a problem even in the museums and academic institutions of developed nations where the appreciation of the public and policy makers of their value is limited. In developing countries there is a valuable intermediate role for Plant Clinics in diagnosing arthropod and pathogen problems (Bentley et al., 2009). Diagnosis and identification is only part of the problem and must be followed by surveillance and information exchange if the impact of pest species is to be mitigated. For this reason there is a major need for diagnostic networks to be developed worldwide (Miller et al., 2009). Although the technical ability to diagnose pest problems has undoubtedly improved, their impact in developing countries may still be underestimated. There is still a lack of appreciation of linking diagnosis and pest identification with local farmers' perspectives and in some cases this can be exacerbated where knowledge systems, including classification of pests, bears no resemblance to that of scientific taxonomy.

Finally it should be noted that modern techniques for rapid sequencing and genome analysis of nucleic acids from diseased plants and biosensors for pest detection/plant damage will aid identification of novel disease agents and surveillance, potentially revolutionising the ability to provide early warnings and responses to emerging pest problems, whether of plants or animals. However, such developments depend on an extant taxonomy to provide a comparative base-line.

The contribution of taxonomy to food security and safety

The challenge of feeding 9 billion people was an issue addressed in a recent publication in the prestigious journal Science (Godfray et al., 2010). As with the major questions posed for agriculture, there is little explicit recognition of the importance of taxonomy in meeting this challenge. Food security requires a much wider perspective than consideration of agricultural productivity or sustainability (e.g. the contribution of biodiversity in what some have termed 'ecosystem services'); it requires analysis of the entire food supply chain, domestic policy and multilateral agreements concerning trade. An additional consideration is the question of food safety, whether for human consumption or as feed for livestock. The taxonomic relevance of this lies in the mycotoxins produced by toxigenic fungi in the growing crop. In some cases identification of the causal fungi at the species level is sufficient, but in most cases identification of toxigenic strains within a species or species complex is necessary. The Codex Alimentarius does not deal explicitly with such taxonomic issues.

Taxonomy: an essential issue in Plant Health

Plant health is a generic term that covers biotic and abiotic factors interacting with plant growth, development and, in the case of economic crops, yield. The term also applies to plant communities in agricultural settings, e.g. grazed grasslands, and forests where there are mixed multifunctional species plantings, e.g. for amenity and recreation. The importance of taxonomy lies in the identification of the pest organisms, i.e. pathogenic micro-organisms, arthropods and weeds/invasive plants, that have a deleterious effect on plants in whatever setting. There is also relevance in identifying organisms such as fungal endophytes, pollinators and natural enemies of pests that interact beneficially with plants. The taxonomic challenge in these cases can be greater than with pests.

Taxonomy and the international regulatory framework

International Plant Protection Convention

The International Plant Protection Convention has as its purpose the protection of plant life and health from the introduction and spread of pests (Devorshak, 2002). The IPPC explicitly recognises that countries retain the right to take measures to protect plant health and their environments from risks arising from pests, provided these measures are based on scientific evidence and risk analyses. Hence the measures are dependent upon national abilities to identify pest organisms and the need for strong taxonomic support in plant quarantine regulation. As an intergovernmental organization whose member countries are contracting parties to the IPPC, CABI is well place to provide assistance in implementation of the Convention as are the LOOPs of BioNET, especially with regard to the Regional Plant Protection Organisations of the South, where in general there is much less activity and expertise than in the North (e.g. EPPO/NAPPO).

World Trade Organisation

The creation of the World Trade Organization (WTO) increased the trade in agricultural products, including plants and plant products, and also demonstrated the need for taxonomy and strong taxonomic support (Devorshak, 2002). The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) again states the need to set measures to protect plant life and health in a situation where pests and invasive species more generally are moving globally at an increased rate. Thus there is congruence but also the potential for conflict between the aims of the ICPP and the WTO – plant protection cannot masquerade as trade protection.

Other Intergovernmental Agreements and Frameworks

In every aspect of the Convention on Biological Diversity (CBD) there is a need to consider taxonomy and taxonomic products in support of biodiversity research, exploitation and protection; a framework that is largely absent in agriculture research despite the IPPC and WTO requirements, which only deal with certain aspects of plant health and trade. In the context of the United Nations Framework Convention for Climate Change (UNFCCC) the scenarios predicted under climate change would potentially lead to range changes for agricultural crops, grassland and forests, and importantly for the pests that afflict them. An important consideration is that species that are relatively benign, cryptic or cause only minor damage may become serious pests under climate change, whether in their original or their expanded range. The consequence is that because of the lack of previous recognition there would be a

taxonomic issue to deal with before appropriate measures could be enacted.

Other regulatory bodies

Plant Health regulation (e.g. quarantine harmful organisms, regulated but non-quarantine organisms, approved treatments for imports, derogations) are the responsibility of competent national authorities (where these exist). For the member states of the EU, there is an additional level of regulation that applies. The European Food Safety Authority is the Agency of the European Commission (SANCO) that deals with risk assessments relating to plant health. The national and supra-national policy and governance issues relating to plant health are described in MacLeod et al. (2010). The importance of taxonomy is pervasive throughout plant health regulation. In some cases the organisms on quarantine lists are incorrectly named, in the case of a previously undescribed pathogen, measures cannot be applied before the organism is formally identified.

Taxonomic initiatives in agricultural research for development and food security

BioNET was established in 1993 to respond to the need for taxonomic support and products in developing countries, with a Secretariat in Egham, UK, hosted by CABI and a network of regional LOOPs. The relationship with CABI, although BioNET is quasi-independent (and the LOOPs are completely so), has been critical in its development, certainly with regard to agricultural research for development. The link has also corresponded with a general reduction in the taxonomic activity of CABI in its historical areas of mycology, parasitology, entomology and biological control. The major sponsors of the Secretariat-led BioNET Global Programme have been the SDC, Sweden and the EU. Much of the actual taxonomically-related activity in the LOOPs is funded often through small scale and short term projects, training workshops and publications. As a consequence the range of activities and outcomes has been *ad hoc* and unbalanced without an overall rationale.

Other players providing taxonomic services and products

In terms of providers (and users) of taxonomic services and products related to agricultural research for development, there are some national organisations (e.g. the Centre for Biological Information Technology, Australia), but few if any regional players in developing countries (other than the BioNET LOOPs). As an international organisation, CABI through its scientific sites (Egham and Switzerland) and to a lesser extent its regional centres retains some taxonomic expertise. A major CABI initiative has been the system of Global Plant Clinics, from which in part has developed the Plantwise initiative discussed below. FAO continues to play a role in its involvement with workshops, training courses and documentation. There is a great need in the CG system of International Agricultural Research Centres for taxonomic services and support for plant pests. For example, the International Rice Research Institute in the Philippines has a much reduced resource in the plant pest disciplines, which makes the allocation of resources to taxonomy difficult at a time when new rice pests are emerging or re-emerging.

The Plantwise initiative

At the 2009 CABI Review Summit a Global Plant Health initiative “Plantwise” was proposed and endorsed by Member Countries. This initiative consisted of two components: an extension of the existing Global Plant Clinics and a comprehensive plant health database or knowledge bank. The Plant Clinic component has been

successfully taken up by a number of countries at a rate faster than the CABI business plan. A prototype knowledge bank was presented at the CABI Review Conference in London (15-16 February). Fund raising for this component has been difficult under the present economic climate, and although the time-line for progress of Plantwise has been met, fund raising will be important over the next two years. Full details of progress on the initiative are given in the paper presented by the CABI Chief Executive at the Review Conference.

An internal document by the CABI Chief Scientist on "Strategic entry points for funding taxonomic support to agriculture in developing countries" included consideration of the relationship of Plantwise with BioNET, particularly concerning: the link between diagnosis (the concern of the Plant Clinics) and identification (the concern of BioNET); the need for identification keys, pest checklists, and training; the question of national/regional units for identification and quality control of diagnoses; the contribution of the LOOPS; and access to BioNET expertise and resources. Clearly there is partial overlap that affects respective fundraising activities and CABI priorities. Nevertheless it is also clear that Plantwise would benefit from the taxonomic support that BioNET could provide. The main conclusion in this document is that BioNET's activities in plant health should be integrated into and supported financially by Plantwise, except where there is clear advantage in using the BioNET identity. The meeting referred to in outcome [20] below examined the potential Plantwise/BioNET synergies and the contribution BioNET could make to Plantwise, and in particular the communication issues relating to donors. A discussion document was prepared for the meeting. The synopsis of the meeting set out both short term actions for exploring and developing the synergies, and further actions for incorporating in the next phase of BioNET funding, although the precise hierarchical arrangements have yet to be determined.

Analysis of BioNET outcomes

BioNET outcomes are organised according to the objectives set out in Annex 9 and Annex 10. In relation to Evaluation Question 2, here the outcomes corresponding to objectives 3-5 are analysed in full (

Table **5**).

Table 5 – Accelerate the development of taxonomic resources, tools and technologies

Global Programme Categories of "Objectives" in the SDC 2008-2011 Logframe	Outcomes
3. Mobilise taxonomists to develop taxonomic resources and use them to deliver user-friendly, demand-driven products.	18, 19, 20, 21, 91, 95, 102, 103, 140, 141, 143, and 145
4. Facilitate innovative approaches to taxonomic product development using digital and molecular technologies, resources and tools.	
4a – CBOL	22, 23, 24, 104, 134
4b – CBIT	25, 26, 146
4c – EoL	27
4d – GBIF	28, 144, 147, 154, 169, 170, 177
4e – Other (biodiversity informatics)	29-32, 109, 127, 131, 135, 142, 153, 163, 164, 168, 171

5. Promote optimisation and dissemination of taxonomic products to meet local market needs.	34, 159

Objective 3 – Mobilising taxonomists to develop taxonomic resources and use them to deliver user friendly, demand-driven products.

This objective has two components, assessing and addressing user needs. Assessment of needs was illustrated by the project funded through Defra held in conjunction with the Natural History Museum (NHM) and BioNET (Secretariat and WARFRINET) to assess Ghana's taxonomic needs [18]. The project was based on methodology promoted at the 8th Conference of the Parties to the CBD in 2006. Dissemination took various forms, both in Ghana and regionally, and the recommendations have been reflected in the revised Ghanaian National Biodiversity Strategy and Action Plan (Interview with A. O-Y in Annex 10). The partnership with the NHM also led to the publication (Smith et al., 2008) of an assessment of taxonomic support required for invasive species management [19], co-funded by Defra and the Global Invasive Species Programme (GISP). Claiming to be the first global-level assessment, the results of the project were presented at the 9th Conference of the Parties to the CBD and the International Congress of Entomology in 2008. For sub-Saharan Africa, a needs assessment workshop organised by the BioNET Secretariat and EAFRINET [21] led to the three project proposals being submitted to donors.

In 2009 the new CABI initiative in plant health services started, "Plantwise". This is still in the pre-implementation stage and in September 2010 the potential contributions of BioNET to the initiative were discussed at a strategy meeting ([20] full-blown outcome, Annex 6). The background paper was written by Richard Smith and John Mauremootoo of the BioNET Secretariat. Concerns have been expressed by CABI over the fund raising role of BioNET within the wider Plantwise vision.[18] The significance of BioNET to Plantwise (and vice-versa) is discussed in the Interpretation and Synthesis (of outcomes) section below.

[141] In the course of 2010, African researchers and taxonomists[1] developed user friendly-keys of invasive plants species, pests and pollinators that can meet end-user needs (e.g. farmers, conservation managers, agricultural extensionists and quarantine officers) in Kenya, Uganda and Tanzania.

Regional thematic experts have been invited to undertake tools and products production under the BioNET-Sec and EAFRINET led UVIMA Project in order to develop taxonomic tools and products to influence taxonomists in the region to develop user-friendly keys for other species. As they will realise the ease with which the information readily available in research institutions can be put together in this format.

[34] In 2009, the International Association for the Plant Protection Sciences chose to highlight the contribution of taxonomy the plant protection by publicising BioNET's 'Why Taxonomy Matters' case studies.

Since 2003, BioNET's Secretariat has compiled and edited the "Why Taxonomy Matters" case studies to promote appreciation and understanding of the societal benefits of taxonomy including its relevance to promoting plant health.

Considerable attention has been given to the question of bee and other pollinator species taxonomy, and addressing user needs in Africa [91, 102, 103, 140, 141, 143, and 145]. In one instance needs were addressed in the context of novel approaches involving DNA barcoding [95]

18 Phil Abrahams (Market Development Director, CABI). In substantiating outcome [20] on BioNET's contribution, he made the comment that his response was made on "his understanding of Plantwise's need for some parts of BioNET's services within Plantwise's overall basket of needs from other content partners".

discussed below under Objective 4. Clearly pollinator species are of critical importance in agriculture and horticulture, but the specific needs and requirement need to be clearly defined, e.g. in the bringing together of African researchers and plant, pollinator and pest taxonomic specialists [141], to meet the end-user needs (farmer, agricultural extensionists, and quarantine officers).

Objective 4 – Facilitate innovative approaches to taxonomic development using digital and molecular technologies, resources and tools.

The Consortium of the Barcode of Life (CBOL) is potentially an important initiative facilitating and promoting the use of user-friendly DNA barcoding technologies in taxonomic product development [22-24, 104, 134]. BioNET is recognised as the principal partner in holding regional workshops and five have been held with SDC support and around 65% co-financed from other sources. However implementation of these technologies has been restricted in an agricultural/plant health setting and it is at present unclear how such technologies will be considered or feature in future plant health regulation.[19]

User friendly taxonomic keys and fact sheets are an essential innovative tool for the use of non-taxonomic specialists in plant health as a first step in identifying pest species (arthropods, pathogens, weeds). The Lucid Keys software developed by the Centre for Biological Information Technology (CBIT) of the University of Queensland, Australia, is a world leader in this area and the importance of this link with BioNET cannot be overstated [26 and 146].[20]

[26 and 146] In October 2010, CBIT (the Centre for Biological Information Technology – Queensland Australia) established a collaborative link with BioNET-EAFRINET to produce user-friendly taxonomic keys and fact sheets.

John Mauremootoo of the BioNET Secretariat and Mathew Taylor, Director of CBIT negotiated a collaborative arrangement involving both training in the use of Lucid software and a mentoring package for the subsequent application of the software to produce taxonomic tools and products with CBIT following meetings between Geoff Norton of CBIT and Richard Smith and the subsequent participation of Geoff Norton in the UVIMA Project Planning Meeting in Kenya in July 2009.

BioNET joined the steering committee of the Encyclopedia of Life (EoL) "e-Biosphere" Conference [27]. Informatics is a key innovation in archiving, retrieving, sharing and utilising information in all areas of taxonomic work, including but not peculiar to agriculture/plant health. BioNET's support for the Global Biodiversity Information Facility (GBIF) has enabled informatics to be extended in the developing world: in East Africa [28, where a proposal to SwedBio was successful, 144, 147, 154], Venezuela [169, 170], and the Pacific [177]. Except in East Africa, especially in Kenya, there have been no concrete outcomes other than the provision of advice and proposal discussions. Again the value of

19 Richard Baker (Pest Risk Analyst, FERA). In commenting on the role of DNA barcoding in relation to plant health regulation stated, "I think many in plant health remain a little sceptical about the use of this technology because barcodes often seem, to be based on too few specimens from too few places within the species range to be sure that the profiles (a) truly represent the variation within a species and (b) correctly separate them from congenors."

20 See full outcome formulation in Annex 6. Also, Geoff Norton (Associate Director, CBIT and independent consultant) was involved in outcomes [26] and [146] (see full-blown substantiation by Matthew Taylor, Director CBIT) made additional comments on CBIT links with BioNET: " I have been encouraging BioNET to explore a much more collaborative approach to identification and diagnostic keys with all the character states, images, scores and SPP descriptions, and then modifying this key and adding in species and other content to make them more relevant to local conditions."

informatics is for general taxonomic work rather than being specific for agricultural research. This comment also applies to the other outcomes noted in relation to biodiversity informatics [29-32, 109, 127, 131, 135, 142, 153, 163, 164, 168, 171].

Objective 5 – Promoting optimisation and dissemination of taxonomic products to meet local market needs

The International Association for the Plant Protection Sciences (IAPPS) is an important and influential organisation that provides a link between academic researchers, practitioners, extensionists, and farmers in areas concerning plant health. By choosing to support and highlight the "Why taxonomy matters" case studies, the IAPPS demonstrates the relevance of BioNET for the plant health community in four key areas [34]. The relevance is demonstrated by the value shown by taxonomy in dealing with the armyworm outbreak in Liberia. Other outcomes claimed follow normal routes for pest identifications [159], which would probably have occurred, without BioNET, or have global rather than local implications [34].

Other Objectives have outcomes relevant to Evaluation Question 2.

A selected number of these are now presented and analysed.

Objectives 1 and 2 – Strengthen and develop the capacity of the LOOPs.

The International Institute of Tropical Agriculture (IITA) has taken on the important role of regional co-ordinator in W Africa [98], strengthening the links with a CG Centre and facilitating collaboration between national institutes as reflected in e.g. [96]. A "Roadmap" to guide the work of BioNET in promoting taxonomy in relation to food security and other key areas [5] was developed and published in 2009. The BioNET Secretariat (through the UVIMA project) has provided, among other things, support to EAFRINET and the Regional Co-ordinating Centre in Kenya for the development of checklists, keys, and factsheets for pests, pollinators, and invasive plants [137]. ANDINET has assisted CARINET in a project to identify agricultural pests [165] because of the apparent greater number of taxonomists in the Andean region, an example of inter-LOOP cooperation.

The relevant outcomes under Objective 2 relate to bees and pollinators [107, 110, 111,], reflecting the importance of this topic in the outcomes under Objective 3.

Objective 7 – and timely technical input into policy development

Outcomes relating to Invasive alien species are also a concern under SPS measures as well as the CBD as analysed in Evaluation Question 3 (Table 7).

Objective 8 – Promote taxonomy at all levels

Taxonomy has been promoted in both secondary and tertiary education and professionally. In Tanzania, biology teachers have requested and received taxonomic support in identifying agricultural pests as part of the teaching curricula [149]. In Uganda, an entomology lecturer at Makerere University has participated in BioNET activities, although the extent to which this involvement has entered the undergraduate curriculum is not known [155]. In terms of professional promotion the prestigious Entomological Society of America invited an ANDINONET speaker to make a presentation on BioNET at their Annual Meeting in 2008 [53].

Objective 10 – Secure financial support for LOOP-led activities

In the three years to 2010, AusAid funded 13 workshops on taxonomy in relation to capacity building in plant health, specifically with regard to pest and disease diagnosis [133]. Funding was secured through ASEANET, who acted as local organizers and/or resource persons. Success or otherwise of these workshops is not a question to be evaluated under this objective. SAFRINET was successful in obtaining funding to develop systems for providing phytosanitary certificates for citrus exports [105]. The outcome of this project funding is not known (there are for example major disease constraints on exports into the EU) but again this is not evaluated under this objective. SAFRINET was awarded a grant to develop a bee collection database in 2008 [105]. The Oceanic regional PPO endorsed the BioNET Regional Diagnostic Networks initiative (based on the ASEANET strategy) [191]. A concept note was developed with PACINET, but no information on funding was provided. In W Africa the national BioNET co-ordinating institutes in Ghana, Nigeria and Togo, together with the International Institute of Tropical Agriculture [96], drafted concept notes for funding following a DNA barcoding workshop. This selection of outcomes relating to financial support for the LOOPs demonstrated the perhaps inevitably fragmented nature of the funding.

Interpretation and Synthesis

For Evaluation Question 2, the outcomes identified for objectives 3-5 can be synthesised under two categories, that (i) taxonomists better understand end-user needs and the potential for using innovative approaches to addressing needs in agricultural research for development (Objectives 3 and 4); and (ii) taxonomists, through co-operation with technology partners and end-users, develop and disseminate products to address poverty reduction and food security needs (Objective 5).

There is substantial evidence in the substantiated outcomes from the evaluation that taxonomists of various types (from academic systematic researchers to field practitioners) have been confronted with, educated by and as a consequence better understand end-user needs in developing countries. One of the problems with taxonomy in the past has been the view of taxonomists as specialists burrowing away in herbaria/museums with a lack of appreciation of the outside world or the role that pest organisms actually play. To some extent this has been a parody of the actual situation, but the achievement of BioNET has been to demonstrate the importance and relevance of taxonomy in agriculture, from the field problem, to initial diagnosis to identification. What is also re-assuring is that, although the Global Secretariat is a critical element in this success, the LOOPs have shown that national and regional activity can be generated and carried out from their own initiatives, although inevitably this can seem disjointed and unbalanced when seen across the board. The problem to be faced, despite the many attempts by BioNET, CABI and other players, is to convince those responsible for policy and decisions on agricultural research funding that taxonomy as promoted by BioNET is and will be an important underlying component worthy of support.

For this reason, it is particularly important that taxonomists work with other partners to demonstrate that the products developed are disseminated and shown to be of value to end-users. The problem with meta-outcome (ii) is that it is couched in terms that are overstated if not grandiose. Taxonomists will not directly address poverty reduction, food security and climate change. The best that can be achieved is to show that there are taxonomic issues involved in these areas, that involvement with BioNET is a way of

addressing the issues, and that there is a broader coalition they are working with in these key areas. The major partners in this coalition could be the Centres of the Consultative Group (CG) on International Agricultural Research, whose agendas fit exactly these areas, and where pest taxonomic expertise has been much depleted both at the Centres and with their in-country partners. There is an opportunity for much closer working of the LOOPs not only with the national and regional co-ordinating institutions but also with the CG Centres whose mandates cover their regions.

As mentioned above, the role currently played by the Global Secretariat hosted by CABI is a critical element in the continuing success of BioNET. The functioning of LOOPs as part of a network cannot take place without some form of co-ordination hub. Nevertheless, the "Plantwise" initiative currently being planned by CABI represents potentially a step-change in their business. Currently, one of the major issues facing plant health (and indeed animal health) globally is that of pest vigilance and surveillance: how can signals representing a plant health problem be retrieved, filtered and ground-truthed to assess their significance. This is especially problematic for developing countries, and even for developed agricultures. Surveillance is much more than monitoring or conducting surveys and only by completing the sequence from signal to significance can an effective early warning system be devised. By combining an extended system of global plant clinics in strategically-placed countries with the documentation and IT resources and capabilities of CABI, Plantwise could provide a service that has not been catered for by FAO (unlike, arguably, the role played by WHO in global public health). Such a service could also be seen as complementing and enhancing the work of the international Centres. How in the future should the Global Secretariat interact with and within Plantwise and how would this affect the operation of the LOOPs? What would be appropriate in future approaches to donors for funding and/or in terms of relationships with other partners in BioNET? These are critical questions that require urgent attention.

In conclusion, taxonomy plays an important though sometimes unrecognised role in all areas of agricultural research in developing countries. In plant health regulation, it is an essential component. It also makes a significant contribution to broader-based research and practise in food security. BioNET has been the major international player in promoting taxonomy and the dissemination of taxonomic products in the agriculture of developing countries. This is based on the close working relationship with CABI (*sensu stricto*) and the LOOPs, and in agriculture at least could be strengthened by working with and complementing the programmes of the International CG Centres. It is difficult to identify any other organisation or initiative that could undertake this role equally effectively.

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EVALUATION QUESTION #3: TO WHAT EXTENT AND HOW DO THE OUTCOMES OF BIONET REPRESENT A CONTRIBUTION, OR POTENTIAL CONTRIBUTION, TO IMPLEMENTING THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)?[21]

Background

This report is based on the group of expected outcomes that are presented (Annex 10) that come under the chapeau of "*Contribute to an enabling policy environment and communications*". The Objectives relating to Question 3 are four in number (for details see table in Annex 4 – BioNET's Predefined Objectives and Outcomes, 2007-2010, first column):

- 6. Promote the long-term sustainability of the taxonomic sector through enabling policy environment,
- 7. Provide technical input into policy development through the CBD, IPPC and WTO,
- 8. Promote taxonomy to strengthen the implementation of global multilateral agreements and regional processes, and
- 9. Produce a website, e-bulletin, and public relations products on taxonomy

The available collected outcomes for analysis are 32 relating directly to the BioNET Global Secretariat and the BioNET LOOPs as in Table 1, below. Other sources of information are listed below.

Introduction to the CBD and the position of Taxonomy

The Convention on Biological Diversity was launched in 1992 at the UNCED Rio Conference, entered into force in late 1993 and had its first Conference of Parties (COP) in the Bahamas in November/December 1994. Taxonomy was/is not mentioned in the formal Convention Text or in the first COP. There were passing references to the

21 Geoffrey Howard was primarily responsible for this chapter.

importance of taxonomy to biodiversity conservation and its sustainable utilization in SBSTTA 2[22] and COP2 and then serious consideration of the Global Taxonomy Initiative at COP4 in 1998. By COP5 in 2000, the Global Taxonomy Initiative (GTI) of CBD was well-established with a novel Coordination Mechanism that included BioNET amongst its members… and does so to this day.

BioNET was established in 1993 (see Introduction, page 1, above) and was in a good position to take a significant role in discussions around the GTI, its development, technical content and management – together with the CBD Secretariat and the Parties to the Convention. At least since 2000, a representative of BioNET has attended all the COPs and SBSTTA meetings of CBD – and the nine official meetings of the GTI Coordination Mechanism.

CBD Secretariat, CBD processes and BioNET

Prior to the period subject to this evaluation, the CBD Secretariat and its meetings have welcomed the assistance of BioNET and have allocated roles and requested actions in the GTI. For example when the Programme of Work (PoW) for the GTI was first being devised during COP6 in 2002, BioNET was listed as a partner in many of the planned activities (Decision VI/8) and when the details of the planned activities of the GTI PoW were developed at COP8 (in 2006, reported in Decision IX/22), BioNET was listed as a suggested actor in 10 out of 19 Activities and in 21 out of 54 outputs (i.e. more than any other organisation). Further, BioNET was asked to develop a special fund for support to the GTI outside of the CBD (Decision VIII/3) and to work with the Interim Steering Committee of the fund to seek suitable sources of income.

In 2004, a suggestion was made that there should be a Guide to the GTI. A first draft was prepared by one of the BioNET Board Members, which was upgraded in 2006 and eventually published (by the CBD Secretariat) in 2008[23]. While this is not a BioNET publication nor has it a BioNET author, its design, preparation and much of its content originated with the network.

CBD Parties, GTI and BioNET

Also prior to the period subject to this evaluation, during the period of the first four National Reports to the CBD (including the recent 4th Report due before COP10) there was no specific mention of BioNET, primarily because no requests were made by the CBD Secretariat for information from countries about their implementation and use of the GTI. A specific National Report on Implementation of the PoW for the GTI was requested by the CBD to be finalized in 2004 (and actually, in 2005) for consideration during the In-Depth Review of the GTI at COP8, but while this only yielded 25 responses (out of 190+ countries!), BioNET was mentioned by six of them – with a preponderance from Developing Countries.

22 SBSTTA is the Subsidiary Body on Scientific, Technical and Technological Advice of the CBD which meets at least every 1.5 years and sometimes twice in one year – and advises and provides draft recommendations to the COP

23 Secretariat of the CBD, 2008. Guide to the Global Taxonomy initiative. Technical Series No. 30, Montreal, Canada, 156 pp.

Information gathered, analysis and interpretation

BioNET Outcomes collected in answering Evaluation Question 3 (above)

Some 187 BioNET Outcomes were collected and verified during the data collection for the present Review and this section (answering Question 3) concentrated on the 31 outcomes directly relevant in Annex 9 – . The remainder of the outcomes were examined and any with relevance to the four Objectives 6-9, above, were examined and noted (only outcomes 33, 62, 69, 69 and 187 added any new perspectives). The substantiation had already taken place during which one or more independent sources checked each of the suggested outcomes and their response is noted in Annex 6**.**

Other data collected

Information concerning the CBD Global Taxonomy Initiative and related issues as well as contacts from Parties to the convention, other CBD programmes and cross-cutting initiatives and CBD documents were accessed from the CBD website www.cbd.int as well as in person at recent meetings and through many years of interaction with the CBD, GTI and other aspects of the relevant international agreements and international institutions. A summary account of interviews by GH is contained in Annex 11.

Table 6 – Distribution of BioNET Outcomes directly relevant to development of an enabling policy environment across the four subsections and two origins.

Classification by Global Programme Objectives in the SDC 2008-2011 Logframe	TOTAL
6. Promote the long-term sustainability of the taxonomic sector by helping create an enabling policy environment and by providing unique communication services.	8
7. Provide relevant and timely technical input into policy development, advocating (under CBD) the roles and capacity needs of taxonomy in IAS management and ABS and (under IPPC and WTO) sanitary and phytosanitary measures.	9
8. Promote taxonomy at all levels to strengthen the implementation of global multilateral agreements and regional processes.	10
9. Produce a website, e-Bulletin, and PR products on taxonomy to facilitate outreach and electronic information exchange between potential collaborators.	5

Relationships of BioNET that have generated relevant outcomes to this review were gathered through email exchanges, internet documents, personal interviews, telephone conversations, collected documents and, again, many years of interaction with this topic which has been called – *the Taxonomic Impediment.* This term, coined by the parties to the CBD through the GTI (with input from BioNET) refers to "*the problems of insufficient knowledge of all components of biological diversity, including their classification, description, value and functions and lack of taxonomic capacity – as contained in CBD Decision VI/8*." This part of the Review concentrated on the outcomes and associations that BioNET has with the CBD (in its many forms of Secretariat and management, states parties, functions such as SBSTTAs and COPs and its expanding mandates for the achievement of its three main objectives:

- Conservation of Biodiversity in all its forms
- Sustainable Use of Biodiversity
- Fair and equitable benefits of biodiversity available to all

It is generally recognized that all of these involve the credible use of taxonomy and so

are subject to the Taxonomic Impediment.

BioNET, with its stated objective to assist countries in their implementation of key multilateral agreements (in relation to taxonomy) has centred its activities in this area on the Convention on Biological Diversity and, especially, its Global Taxonomy Initiative – but also other programmes and cross-cutting issues of the CBD and related international conventions. Thus the present part of this current review will examine to what extent BioNET has generated outcomes that influenced the principal nine dimensions that are considered key to the CBD.

1.BioNET and the CBD signatories

Outcomes recorded concerning the likely impact of BioNET on the CD process from the viewpoints of CBD Signatories (or Parties to the Convention) are shown above in Table 7– Row 1. These consist of 16 Outcomes most of which (87.5%) were from the combined Objectives 6, 7, 8 and 9, while two were from outcomes that correspond to other Objectives. collected to answer other evaluation questions. In addition there are several results from interviews and a considerable amount of literature emanating from BioNET LOOPs, members and signatories to the CBD that are available on the internet.

Relying on the outcomes and interviews recorded it is clear that a majority of opinion agrees that BioNET, in its present form, or, at least the presence it has had for the period 2007-2010, is helpful to the CBD signatories in their interactions related to taxonomy with the CBD as well as in their national attempts to address the Taxonomic Impediment (Column 1, Table 7). Three outcomes were not completely convincing to this end (Column 2) but showed some support for BioNET's impact on the CBD from the signatories and other parties; however none was entirely negative. This encouraging positivity implies that the CBD owners (the CBD Parties) and related organizations viewed the impact of BioNET as at least useful and in some cases quite essential to achieving the objectives of the Convention.

The interview (A, with Prof, Oteng-Yeboah) was entirely positive – but this is not surprising as he has been a champion of BioNET in the past as well as a recipient (through the West African LOOP) of assistance from BioNET for his country. Nonetheless, he has been associated with several organs of the CBD since its inception – for this reason we regard his opinion as very valuable. The two uncertain results from interviews (B and C, Column 2) were from delegated national scientific focal points of the GTI who had little or no direct experience of BioNET. However, we were finally able to contact the authoritative CBD National Focal Point[24] in the same country who confirmed that BioNET is well known and appreciated in relation to taxonomy, CBD and GTI (Interview L, Annex 11).

[24] Fifteen National Focal Points for the CBD in 15 developing countries were contacted by email with requests for telephone interviews; short questions were supplied and requests made for delegation of a spokesperson. Alas only one country responded.

Table 7 – Classification of relevance of outcomes and interactions connecting BioNET and the international policy arena, especially relating to CBD and associated conventions and organisations

Key elements of the CBD and international biodiversity policy	Evidence that BioNET contributed to the CBD processes and international policy agendas		
	1.Outcomes** and actions **FULLY** correspond	**2.** Outcomes** and actions **PARTIALLY** correspond	**3.** Outcomes** and actions that do **NOT** correspond
1.CBD States Parties and related national or regional needs or processes	12, 47, 54, 55, 56, 58, 59, 124, 148, 149, 150, 155, +68*** Interview A, L	53, 106; +187*** Interviews B, C	
2. CBD (Secretariat and Functions), Global Taxonomy Initiative and its Coordination Mechanism	12, 34, 36, 37, 41, 42, 43, 44, 47, 48, 49, 50, 51, 52, 54, 55, 56, 58, 124, +69*** Interviews A, E, G, (D)	40, 53; +62***	(Interview D)
3. CBD Invasive Species Theme	47 and docs		
4. CBD Access and Benefit Sharing programme and protocol	Interview Jb		
5. Global Strategy on Plant Conservation	39; Interview E	Interview Jc	
6. CBD Strategic Plan 2011-2020 and Targets	Interview I, Ja		
7. International Plant Protection Convention	Interview F		
8. World Trade Organisation SPS			Interview H
9. UNESCO -	37, 47, 51, 52		
10. Other relevant institutions	38, 45, 49, 151		

** Outcome numbers from Annex 8. *** Outcomes listed in responses to other Questions, but of relevance to Question 3. For Interviews, see Annex 11.

2. BioNET and the CBD Secretariat, the GTI and its Coordination Mechanism

Data related to the outcomes reported for BioNET affecting the CBD Secretariat, the Global Taxonomy Initiative and its Coordination Mechanism (Table 7, Row 2) were more numerous as were the interviews. Some 23 outcomes are listed – most from sections 6-9 of the classified outcomes (Annex 10) and two from other parts of the assessment of outcomes. Twenty outcomes confirmed that BioNET was having important impacts on the CBD and its taxonomic theme, while three were less certain. None was negative.

Concerning interviews, three were positive. None was negative and Interview D is bracketed and placed in both positive and not-positive columns because it contained much positive information but comes from the BioNET Global Secretariat team. That is not to say it is not reliable, but to suggest that this valuable information does not come without a measure of conflict of interest, but was nevertheless necessary to discuss some issues in order to understand perspectives of the BioNET team.

CBD Decision X/39 (from COP10 on the GTI) acknowledges the work of BioNET-International for contributing to the Special Trust Fund for the GTI (para 14) and welcomes the section on taxonomy as part of the statement and recommendation from UNESCO IYB Science Policy Conference… and urges parties and other governments, etc., to support seven recommendations from that conference (para 15) which was largely a result of the work of BioNET in organization of the conference contributions on Taxonomy ([37, 47, 51 and 52], Row 9, Table 7).

The CBD Decision X/39 also requests that the GTI Coordination Mechanism (in collaboration with relevant international organizations) hold capacity-building workshops in all sub-regions and regions (para 7) and assist with capacity building and development of GTI-related indicators for the 2011-2020 Strategic Plan (paras 15 & 18) knowing of BioNET's presence in, and support of, the GTI CM. Other relevant CBD documents are SBSTTA Recommendation XIV/14 in UNEP/CBD/COP/10/1/Add.2 concerning results and lessons learned from regional taxonomic needs assessments and identification of priorities; as well as Decision IX/22 from the previous COP endorsing the outcome-oriented deliverables for GTI – where BioNET was listed as a suggested actor in 10 out of 19 Activities and in 21 out of 54 outcomes (see above).

Other documentation provided includes the following publications from BioNET or its staff and associates: *The value of taxonomy to biodiversity and agriculture* (Lyal et al., 2008), *Business Plan for the Preparatory Phase of the Global Taxonomy Partnership Fund* (Rassmann & Smith, 2011) that reinforce these assertions as well as recent statements on the BioNET website (February, 2011) on the Special Fund for the GTI.

3. BioNET and CBD Invasive Alien Species

The CBD Invasive Alien Species Cross-cutting theme has links with BioNET both through its Global Secretariat team and the LOOPs. Outcome 47 is relevant to illustrate links to activities in the LOOPS on the taxonomy of biological invasions (to which this evaluator has contributed for EAFRINET in Kenya and the EA region) while the HQ team attends the CBD meetings on invasive species which subject has a special paragraph in the CBD Convention Text (Article 8(h)) requiring States Parties to prevent and manage alien species that negatively affect biodiversity in all its forms. Taxonomy is essential to recognition, prevention, border issues and management of invasive alien species – and support on these topics has come from BioNET.

The publication by Smith *et al*., 2008. *Invasive species management – what taxonomic support is needed* published through the Global Invasive Species Programme is a product of BioNET (and was financially supported by DEFRA, UK interests in biological invasions) which is now widely recognised as a BioNET link to the Invasive Species theme of the CBD as well as a globally-useful tool.

BioNET's proposed development of a taxonomic indicator for the 2020 Biodiversity Targets will be useful in Target 9 of the 2011-2020 CBD Strategic Plan that refers to prevention and management of invasive species.

4. BioNET and the Access and Benefit Sharing Protocol

The Access and Benefit Sharing (ABS) theme of the CBD has been working for many years to develop the Nagoya Protocol for Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, which was adopted at the 10th COP in Nagoya, Japan, in 2010

(CBD Decision X/1). There are certainly links between ABS issues and the expertise of BioNET and an intention to contribute to the ABS Protocol (see Interview Jb). An example there is the development of an ABS project with an institution related to EAFRINET that needs detailed taxonomic information to acquire successfully biological control organism acquisition from countries signatory to the Protocol.

However it should be noted that no outcomes were described by the BioNET secretariat for this part of CBD as prescribed in Annex 4.

5. BioNET and the Global Strategy on Plant Conservation (GSPC)

The GSPC was revised during COP10 with new targets for 2020 (Decision x/17) and the first two of these (total list of plant species on earth, Red Listing of plant species) have a significant taxonomic component. BioNET through one of its LOOPs was involved in the reporting of GSPC targets in 2006 and their revision for the 2020 series [39], but has not, so far, become involved for the new series of targets (see Interview Jc).

6. BioNET and the 2011-2020 CBD Strategic Plan

The CBD Strategic Plan 2011-2020 was finalised and approved at COP10 in 2010 (CBD Decision x/2) and has 20 targets to be achieved by the end of that period to significantly reduce the rate of biodiversity loss. BioNET has committed itself to be involved with the 20 targets by developing a taxonomic indicator that would be applied to all targets (but especially target 19, Interviews we and Ja). BioNET was a participant in meetings of the 2010 Biodiversity Targets Indicators preparatory meetings in 2007/8 and has a background that includes indicator development that will be relevant to the 2020 Biodiversity Targets.

7. BioNET and the International Plant Protection Convention (IPPC)

IPPC is a UN Convention (housed by FAO) that prepares and manages standards and regulations for the introduction of organisms (plants, animals, micro-organisms) that may affect the health and life of plants (see Evaluation Question 2, section XX, above). IPPC has had links with BioNET concerning the exact identity of the organisms concerned – as species or lesser taxa and genotypes (see Interview F). This support of IPPC is also mentioned in the article by Lyal, *et al*., 2008 as a logical step to include taxonomic processes in all the standard and policy setting conventions and international organizations that deal with biodiversity.

8. BioNET and the WTO SPS agreements

The World Trade Organisation Works with three standard-setting international agreements in an umbrella agreement with world trade rules termed **SPS** (Sanitary and Phytosanitary Measures Agreement) which ensures that no restrictions on imports or exports contravene the international trade regulations. The organizations concerned are IPPC, OIE (the World Animal Health Agreement) and FAO Codex Alimentarius (that deals with food). BioNET is hoping to interact more with WTO SPS and its component agreements in future to ensure accuracy of species and lower taxa identities in the WTO and SPS discussions and rulings.

However it should be noted that no outcomes were described by the BioNET secretariat

for this part of CBD as prescribed in Annex 4.

9. BioNET and UNESCO

UNESCO is another international organization that has some links to international policy on biodiversity through several of its component parts. The interactions with BioNET arose from its assistance to UNESCO during the International Year of Biodiversity (2010) to organize and run the taxonomy component during the UNESCO IYB conference – the decisions from which were eventually adopted in Decision X/39 of CBD COP10. Four outcomes have recorded the stages of this process (Table 7, Row 9) which describe the relevance to the CBD and, in addition the links to UNESCO further enhance the relevance of BioNET to the international policy area on biodiversity.

10. BioNET and other relevant components of global policy

Four outcomes listed in Table 7, Row 10 refer to links between BioNET and international organizations such as the Ramsar Convention on Wetlands of International Importance [151] and UNEP (UN Environment Programme, [45]) which are both components of the international policy on conservation and use of biodiversity. The British Museum (Natural History, [49]) has been (and continues to be) a corner-stone of global taxonomy information while the UK House of Lords [38] has concern for and debates biodiversity issues of international significance. These outcomes illustrate wide-ranging activities of the BioNET system in promoting the need for taxonomy and institutions that are relevant to that.

Synthesis

During the period under review, 2007 to 2010, BioNET has had significant interactions with many organs of international policy relating to biodiversity conservation and its sustainable use. BioNET has brought about a range of significant outcomes that support its Objective C for that period (to "Contribute to an enabling policy environment and Communications") as stated in the SDC Support Logframe for that period.

By far the majority of those outcomes were related to the CBD (through both its Parties and its Secretariat and other CBD organs) as expected – see Table 7, Rows 1 to 6. This was the intention of BioNET and SDC and so this can be seen as a positive set of contributions to the programme's objectives. There were very few doubtful outcomes or less than fully established relationships compared to the positive, achieved outcomes – further evidence of success in this respect.

Amongst the Programmes of Work under the CBD, the most favoured by attention from BioNET was the Global Taxonomy Initiative – which, again, is no surprise as this is the major area of expertise of BioNET. It is also the least developed theme in the CBD structure and the one most in need of support – both technically, organizationally and financially. BioNET has supported all three of those areas either directly or indirectly (as in its membership of the GTI Coordinating Mechanism throughout). BioNET has also taken up the challenge of designing a financial support mechanism and launching it and seeking donor contributions to assist the GTI. BioNET has had at least some involvement in the two major outputs of the Year of Biodiversity from the CBD: the 2011-2020 Strategic Plan and related 2020 Biodiversity Targets and the new protocol of the CBD – the Protocol on Access and Benefit Sharing. Both of these required taxonomic support that came from BioNET, especially to the former.

In addition to the CBD, BioNET has also connected to other strands of international policy related to biodiversity through the standard-setting agreements such as IPPC and the SPS of WTO as well as UN agencies like UNESCO and UNEP.

Few criticisms or negative (or not fully positive) achievement of outcomes have appeared throughout this part of the review. Some LOOPs and Parties have not received the support they would have liked – but this is understandable considering the many demands upon a very small BioNET Secretariat with limited funding to cover the many regions with LOOPs and the many needs of the GTI and other CBD Programmes as well. The most meaningful criticism heard (and which this reviewer confirms and supports) is that the BioNET Secretariat is too small, too understaffed and with limited income to achieve its own desired levels of the BioNET Programme Objectives and desired Outputs and so Outcomes.

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EVALUATION QUESTION #4 – TO WHAT EXTENT WAS MORE MONEY AND DIVERSIFIED SOURCES ACHIEVED, AND WHAT ARE THE MAJOR REASONS FOR THIS?

The BioNET fundraising effort in 2007-2010 focused on the tenth objective of its agreement with SDC: *Secure adequate and sustainable funding for BioNET to enable its LOOPs, partners and other stakeholders to fully address the Taxonomic Impediment and implement the GTI.* Granting that the underlined part of the objective is overly ambitious (i.e., that related to the GTI Special Fund and GTP initiative, relevant outcomes of which are discussed above in answer to Question 1), we find that the evidence we have accumulated in outcomes enables us to answer both the evaluation question and address BioNET's achievements in mobilising financial resources.[25] That

[25] In the evaluation design, we proposed that the criteria for answering this question would be the "coherence of the Global Secretariat's explanation for the pattern of funding in 2007-2010 compared to 2003-2006." The data we were going to use was the audited financial reports and on-the-record written explanations from informants, who would be Richard Smith and the BioNET board members. Based on the data, we were going to prepare a questionnaire and seek written and verbal explanations for fundraising success and failure, strengths and weaknesses.

is, what we will do in this chapter is based on two primary sources of information: the BioNET income data for 2003-2010 and the outcomes for 2007-2010. BioNET's mobilisation of resources generated 46 outcomes right across the network, including donations in money and in-kind as well as a diversity of resource rich relationships within and outside of the network.[26]

Financial support for secretariat-led activities

Between January 2007 and December 2010, BioNET generated £1.1 million in financial contributions for the secretariat-led Global Programme (Table 8). This together with £445,000 secured before 2007 for activities in the 2007-11 period, adds up to half of the £3.1 million required for the full implementation of the 2007-2011 Global Programme. About £600,000 average per year is a modest sum in the light of the demands on the network. Nonetheless, the plan was hugely ambitious – even discounting the amount available at the start of the business plan, the BioNET board approved a budget requiring a four-fold increase in fresh income over what had been raised in the previous four year period! In sum, overall BioNET was unsuccessful in raising the funds it required but it appears to have set unreasonably high demands upon itself. Equally noteworthy, the Global Secretariat, which plays, as the outcomes demonstrate, an articulating, catalytic role in BioNET, continues to receive non-project earmarked funding solely from SDC.

On the positive side of the balance, BioNET was successful in raising more than double the money than it raised in 2003-2006 and in diversifying its sources of funding, increasing from seven to ten. Thus, BioNET's dependence on funding from SDC, BioNET's historical donor, in the last four years went down from 90% to 60% compared to the previous four-year period. Said another way, for every six Swiss francs granted by SDC, four more francs are leveraged, without taking into account the indirect co-financing not received by the Secretariat. In addition, there are the funds and in-kind resources raised by the LOOPs in 2007-2010, which we will examine below.

In the end, the large number of outcomes we harvested that relate to fundraising, plus the financial data that Richard produced, led us to realize we could answer the evaluation question and address BioNET objective #10 without the questionnaire. And we could do so as planned in the evaluation design by reflecting on the BioNET fundraising track record in 2007-2010 – not just financial but also in terms of the 46 outcomes –, in the light of the unique fundraising challenges faced by networks such as BioNET. This is what we do in this chapter. In addition, in the light of the findings, we end as planned by drawing a synthesis about the strengths and weaknesses revealed by the BioNET successes and failures in raising money to date.

[26] The total number is somewhat larger since the 50 outcomes that we classified as primarily corresponding to fundraising. There are other outcomes, especially for the LOOPs, that involve relatively small amounts of money granted but which we considered to be primarily related to another BioNET objective.

Table 8 – BioNET Global Secretariat fundraising record 2003-2010

Source of funding [outcome number]	**Amount received in GBR ,000 pounds** (Currency conversion by www.OANDA.com using average annual exchange rates)							
	03	**04**	**05**	**06***	**07***	**08****	**09**	**10*****
TOTAL (rounded off)	**19**	**440**	**0**	**69**	**27**	**1,068**	**36**	**3**
FAO	10							
The Swiss Agency for Development and Cooperation (SDC)	9							
[60] SDC: 2004-7 agreement.		440						
SDC: BioNET DNA barcoding regional meetings				34				
SDC: Increasing the participation of developing countries in DNA Barcoding					26			
SDC: 2008-11 agreement						653		
[61] The Swedish International Biodiversity Programme (SwedBio)						331		
[62] The European Union						80		
[63] Department for Environment, Food and Rural Affairs (Defra, UK)				25				
[64] The Total Foundation							18	
[65] UNEP (CBD Secretariat) / Government of Spain							16	
[66] Natural History Museum, London				10				
[67] Ministry of Environment, Japan							2	3
[70] European Distributed Institute for Taxonomy				.5	.8			
Organisation of American States / Interamerican Biodiversity Information Network						1.5		
Global Invasive Species Programme (GISP)						3		

"Co-financing": In addition to the sums above, the following was leveraged from other sources but not received by CABI/BioNET Secretariat:

* CBOL/Sloan Foundation provided co-financing funds of £84,200 in 2006, £28,039 in 2007 and £5,437 in 2010.

** The European Distributed Institute for Taxonomy contributed £5,379 in co-financing funds in 2008.

*** UNESCO co-funded an activity for £18,068 and the US National Sciences Foundation for £6,149.

Not reflected in the tabulation of funds actually raised are the outcomes that reflect the fundraising process. One is especially illustrative:

> [68] From October 2007 – December 2010, Marina von Weissenberg, the CBD Focal Point from Finland's Ministry of Environment, has been seeking financial support for BioNET from Finland's Ministry of Foreign Affairs:

- in October, 2007 Finland's Ministry of Environment requested £180,000 from the Ministry of Foreign affairs on behalf of BioNET;
- in 2009 Finland's Ministry of Environment invited BioNET to re-submit a concept note for 250,000 Euros for consideration by the Ministry of Foreign Affairs;
- in September 2010 Finland's Ministry of Environment invited a further resubmission of a concept note for a project (€400,000) to support invasives management in Africa and Asia through Regional Diagnostic Networks;
- in October 2010, Matti Nummelin, Ministry of Foreign Affairs, asked for the concept and initiated discussions with the southern Africa department
- and in November 2010 agreed to discuss further with Richard Smith.

That is, network fundraising involves writing excellent grant proposals but that is only one step in a process. There is a truism amongst fundraising consultants that money is not given from one institution to another but is the result of a relationship between two people who trust each other and believe in what each is doing. In a network especially, fundraising is a long, slow process of building relationships, and the success of resource mobilisation depends on the web of internal and external relations and a process of cultivating them until they bear fruit.

[79] In 2008, CABI made its Project Development Group and the European Commission Key account manager available to support the BioNET Secretariat with developing project proposals.

The decision was made by CABI following BioNET's 24th meeting of the board on June 16, 2008.

This is obvious in the rest of the outcomes related to the Global Secretariat's fundraising efforts. For example, in 2010 alone, there were the following process outcomes that in themselves are important but perhaps what is most interesting are the relationships that are at their core. Proposals have to be submitted, of course, but more importantly, in each case one or more people from the four-person Global Secretariat met with, collaborated, discussed and called on the potential sources of funding.

[76] Viliami T. Fakava and Warea Orapa, SPC, sought and got endorsement in December 2010 for the BioNET Regional Diagnostic Networks initiative from the Oceania regional Plant Protection Organisation executive.

The BioNET Secretariat met with Viliami T. Fakava and Warea Orapa, SPC, a BioNET-PACINET Coordinating Committee member institution, in December 2010 and further developed a concept note, building on the ARDN strategy of BioNET-ASEANET.

[77] In December 2010, CBOL invited the BioNET Secretariat to collaborate and involve the African LOOPs in organizing a first donor meeting with USAID and others to discuss DNA barcoding to support agriculture in Africa.

The BioNET Secretariat and regional coordinators from SAFRINET, EAFRINET and WAFRINET demonstrated the value of BioNET when collaborating with CBOL in delivering DNA barcode awareness raising regional workshops in 2006-9.

[100] In 2010, Dr Scott Miller, the Smithsonian Institution's Principle Investigator for the Sloan Foundation funded project supporting the Consortium for the Barcode of Life (CBOL), accepted a submission by WAFRINET for funding of the Nematode DNA concept.

In April 2010, the discussions and recommendations of participants on two presentations made by WAFRINET-NECI and NACI-Ghana on the current status of WAFRINET at the regional level and in Ghana at the Ghana Taxonomy Need Assessment (TNA) workshop co-led by Dr Chris Lyal, chair of BioNET Board, prompted Chris to call Dr Miller. Subsequently, WAFRINET caught Dr. Miller's attention on its Nematode DNA research submission, prepared with extensive discussion with and advice from nematode experts mediated by the BioNET Secretariat.

[129] In 2010, UNEP-GEF, in support of Regional Diagnostics Networks, solicited BioNET to submit a Project Identification Form in order to develop a full size project, which involves US$12+ million for the project.

Richard Smith and John Mauremootoo met with UNEP-GEF staff in Nairobi, May 2010 to discuss this project idea. BioNET-ASEANET has developed the concept of Regional Diagnostic Networks and is pioneering the ASEAN Regional Diagnostic Network (ARDN), currently operating in a pilot phase. The idea for a pan-LOOP project based on Regional Diagnostics Networks is the result of discussions between BioNET Secretariat and ASEANET personnel.

[130] In November 2010, Takahisa Kusano, advisor to Japan International Cooperation Agency (JICA), reviewed a concept note for Regional Diagnostic Networks (RDN) to support invasives management, a multi-region project that will involve the BioNET Secretariat and CABI.

Richard Smith knew Takahisa Kusano previously and was able to interest him in the RDN concept during discussions at CBD COP10. BioNET-ASEANET has developed the concept of Regional Diagnostic Networks and is pioneering the ASEAN Regional Diagnostic Network (ARDN). The idea for a pan-LOOP project based on Regional Diagnostics Networks is the result of discussions between BioNET Secretariat and ASEANET personnel.

[179] The Global Environment Facility (GEF) secretariat included BioNET as a participant, and has consulted Richard Smith, on a proposal for a comprehensive Invasive Species information system in 2010.

BioNET's involvement in the Global Invasive Species Information Network (GISIN) steering committee led directly to its being included in the project.

The process, of course, may take time, as with the US Department of Agriculture's Collaborative Research Support Program (CRSP) not responding to a proposal for co-funding for the BioNET UVIMA project. Or, it may be delayed and delayed and delayed as occurred with the Ministry of Environment of Austria who has yet to confirm the availability of funds that they had previously indicated may be available. Or the fundraising efforts may not result in final approval, as occurred with NORAD also in 2009. (All three cases are in the "negative" outcome [71].)

In sum, the Global Secretariat doubled the money it raised and registered more positive outcomes than negative ones in its effort to raise more money and from new sources. Furthermore, in the process of mobilising resources, BioNET also influenced significant non-funding actions in a wide array of potential sources that promise to lead to new funding.

Financial support for LOOP-led activities

The core importance of relationships to mobilising resources in a network is perhaps no more obvious than in the 17 outcomes that correspond to securing financial support for LOOP-led activities. Certainly large, multi-year project funding such as the South African Government's award of US$400,000 funding for the Scale Insect Barcoding Initiative (SIBI) reported below [105] is powerful support for BioNET members to accomplish important work. But these large grants are the exception in 2007-2010. For LOOP fundraising, there are three trends visible in Table 9.

Table 9 – Partial list[27] of LOOP resource mobilisation outcomes 2007-2010

Source [outcome number]	**Nature of financial support**
[93] The International Mechanism of Scientific Expertise on Biodiversity (IMoSEB) organized, and provided the (Prof. Amos Akingbohungbe) to attend.	In 2007, funds for a BioNET/WAFRINET representative to attend the African regional consultation on international mechanism of scientific expertise in biodiversity
[94] CORAF (Conference des Responsables de Recherche Agricoles en Afrique de l'Ouest et du Centre) and the French Ministry of Foreign Affairs	During 2007, funded two workshops on vegetable pests in Lome, Togo
[132] U.S. Department of State	In 2007, fully funded the participation of ASEAN members at the ASEAN-NIS invasive species and database development workshop.
[178] Regional organizations who are members of BioNET's Pacific Region LOOP	In 2007, began paying the full time PACINET coordinator position.
[133]Australian Agency for International Development (AusAID)	Between January 2007 to December 2010, funded 13 workshops on a variety of taxonomic subjects
[101] SABIF, the South African node of the Global Biodiversity Information Facility (GBIF)	In 2008, award of a ZAR 87,500 grant to develop a bee collection database as part of the African Pollinator Initiative (API).
[105] South African Government	US$400,000 funding for Scale Insect Barcoding Initiative (SIBI) SIBI 2009-2011 to develop an enhanced system, using DAN barcodes, for providing phytosanitary certification, mainly for citrus exports.
[115] Melon Foundation and Institut Scientifique	In 2009, funds for digitizing of the National Herbarium database in Morocco
[156] SwedBio and SDC	During January, 2009 funded an EAFRINET/UVIMA workshop
[157] The JRS Biodiversity Foundation and the IUCN National Committee of the Netherlands.	During February 2009, funded an East African conservation training course for botanists and zoologists
[116] Tunisian Ministry of Higher Education and Scientific Research, the Centre of Biotechnology of Borj Cedria and National Agronomic Institute of Tunis (INAT)	In 2010, £1,000, £2000 (in-kind) and in cash £1000, and £500 – respectively –for Association Tunisienne de Taxonomie April conference.
[128] AusAID, NZAID and IDRC	In 2010, funds to support ASEANET to establish a regional diagnostic clearing house for specimens equipped with remote microscopy and delivering specimen identifications to users in the agricultural export sector.
[193] USP/SPC/SPREP	US$16,000 salary and in-kind support for Coordinator/Development Officer of PACINET position and over US$1,000 in operating funds
[187] Bernice Bishop Museum	Funding of USD$20,000 to hire a Graduate Assistant to coordinate the compilation of marine invertebrates for Fiji Islands.
[160] Makerere University, the Tropical Pesticide Research Institute, and National Museum of Kenya	Internet, office space, and person-hours worth a total of US $4,000.

One trend was of project grants but of a more limited scope than UVIMA and SIBI. For example, the Melon Foundation and the Institut Scientifique in 2009 provided funds for digitizing the National Herbarium database in Morocco [115]. Another trend was of small grants for BioNET representatives and other scientists to attend events or to

27 This list only includes outcomes that were classified as primarily pertaining to resource mobilisation (objective 10).

sponsor workshops, training courses, conferences or other opportunities for learning and exchange – for example the two workshops on vegetable pests in Lome, Togo during 2007 [94]. The third trend was payment of salaries and other costs for a regional LOOP to operate or to hire staff to carry out LOOP-sponsored initiatives, such as the Bernice Bishop Museum providing USD$20,000 to hire a graduate assistant to coordinate the compilation of marine invertebrates for the Fiji Islands [187].

[[128] In 2010, AusAID, NZAID and IDRC provided funds to support ASEANET to establish a regional diagnostic clearing house for specimens equipped with remote microscopy and delivering specimen identifications to users in the agricultural export sector.

The ASEANET Chairperson and Technical Secretary led the ASEAN Regional Diagnostic Network from concept to pilot phase, as well as the process of liaison with international experts, international donors, regional technical and policy partners to establish a supportive enabling environment.

The pattern of outcomes achieved by the LOOPs are significant in three distinct ways.

First, one of the principal reasons for being and belonging to an international network is to engage and participate with like-minded and similarly committed social actors in projects where a diversity of human and institutional resources can be brought to bear. This is an area in which networks are substantially different from NGOs, government agencies, businesses, academia and other civil society organisations. The participants in networks bring to the common effort human resources but in addition, they bring a much broader array of institutional, physical and financial resources as well. This is why in contrast to many development organisations, networks can generate considerable outputs and outcomes with relatively few additional financial resources. In fact, the BioNET LOOPs do not receive any budget support from the Global Secretariat as is customary in many international networks. Nonetheless, even for a network it is impressive that BioNET generated so many non-funding outcomes (discussed in the previous chapters) with so few additional resources.

[92] In December 2010, the J.R.S. Biodiversity Foundation for the first time accepted a proposal from WAFRINET, specifically for a project concept for the development of a Biological Information System for arthropods in West Africa submitted by WAFRINET through IITA-Benin.

Bernard Agwanda and Patricia Karani of EAFRINET arranged a meeting between Vinand Nantulya, JRS Board member and Muaka Toko of WAFRINET, John Mauremootoo of the BioNET Secretariat and Bernard Agwanda to discuss Muaka's project ideas. Following this meeting Muaka worked with John to develop his project concept.

The second point is that some LOOPs are demonstrating the potential of raising money from non-traditional funding sources. A good example is the JRS Biodiversity Foundation, based in Philadelphia, USA, who is a new grant maker, certainly in Africa.[28] In March 2008, the Foundation contributed to a first time collaboration with BioNET in Africa to develop a project proposal (subsequently submitted successfully to SwedBio for the UVIMA Project) and to hold a series of sensitization training sessions and workshops for decision makers and data holders in East African collections holding institutions [147]. Then in October of the same year, it funded a workshop on Medicinal Plant databases for 40 participants from East Africa [153]. In February 2009, with the IUCN National Committee of the Netherlands, the JRS Foundation funded a regional conservation training course during February 2009 attended by 60 researchers (botanists

28 The J.R.S. Biodiversity Foundation was created in January 2004 when the non-profit publishing company, BIOSIS was sold to Thomson Scientific. The proceeds from that sale were applied to fund an endowment and create a new grant-making foundation

and zoologists) from Kenya, Uganda, and Tanzania [157].[29] These outcomes were obviously precursors to the acceptance by the JRS Foundation of a project proposal from WAFRINET [92] (see the text box).

The third reason why these LOOP outcomes are significant is that they are the product of the interaction of different parts that make up the BioNET network. In this evaluation, one of the constant tensions in formulating outcomes was that often it was difficult to identify who in BioNET was the actor and how they had contributed. Not only was the contribution to a change in a social actor – in this case a source of funding – often partial and indirect but it involved two or three or more people from the BioNET Global Secretariat or the LOOPs. That of course attests fundamentally to the effectiveness of the network.

Therefore, when the outcomes of fundraising on both the Global Programme and LOOP levels are viewed side by side, the picture is of progress towards a larger and more diversified funding base.

Synthesis

To what extent was more money and diversified sources achieved by BioNET in 2007-2010, and what are the major reasons for this?

Did BioNET secure adequate and sustainable funding for BioNET to enable its LOOPs, partners and other stakeholders to fully address the Taxonomic Impediment and implement the GTI?

1. The BioNET Business Plan and SDC Logframe were overly ambitious. To increase income from £500,000 to £3,000,000 in four years would have been a major achievement by any network, or NGO for that matter. In fact, in this evaluator's 14 years of experience with Oxfam Novib, including a portion of work advising grantees on their financial strategy, he cannot recall an instance of any grantee registering that level of fundraising success.
2. Doubling income in the last four years compared to the previous four is a respectable achievement. That said, although the number of large donors doubled too – from 1 to 2 –, and the total number of sources increased from 7 to 10, BioNET is still challenged to enlarge and diversify its funding base.
3. A large and diverse number of outcomes have been achieved and relationships developed in the process of BioNET resource mobilisation in 2007-2010. The potentially important sources of funding on both the Global Secretariat but also the LOOP levels range far and wide: European Union, UNEP's Global Environment Facility, the Japanese Ministry of the Environment, Finland's Ministry of the Environment, USAID, Sloan Foundation, UNESCO, and the US National Sciences Foundation for the Global Secretariat. These are complemented on the LOOP level by outcomes involving financial support from IMoSEB, CORAF, US Department of State, AUSaid, SABIF, South African government, Melon Foundation, JRS Biodiversity Foundation, IUCN, NZAID, and IDRC.

29 Please note that only one of these three outcomes was classified as primarily corresponding to BioNET objective #10. The other two, although involving fundraising were considered to be principally related to a different objective.

GENERAL CONCLUSIONS AND RECOMMENDED POINTS FOR DISCUSSION

Here we will draw general conclusions about our overall findings in terms of the proposed objectives and implicit or explicit outcomes found in the BioNET Business Plan 2007-2011 and the "Objectives" in the SDC 2008-2011 Logframe. See Annex 4 – BioNET's Predefined Objectives and Outcomes, 2007-2010.

Therefore the guiding question in our conclusions is: To what extent did BioNET achieve the *predefined outcomes* it set to accomplish in 2007-2010?

A − Fortify the operational platform (LOOPs)

From the SDC Logframe and the social actors BioNET aims to influence identified in the Business Plan,[30] we identified three types of internal or external changes in social actors that had been predefined and if achieved would represent progress towards the first two objectives. BioNET achieved significant outcomes in the first two:

a) LOOPs develop new capacities to serve as a delivery platform for technical solutions.

b) LOOPs enhance their effectiveness at responding to enquiries though application of BioNET best practice.

LOOPs clearly have achieved capacity that goes beyond being better able to generate technical solutions or respond to enquiries. To varying degrees, they are protagonists in a network through which they transcend the national field of taxonomy and reach into the regional and often the global.

The third type of predefined outcome relates much more to the second and third areas of BioNET's work:

c) Taxonomic institutions and taxonomists, capacity building and technology partners, and policy makers undergo changes influenced by one or more LOOPs that contribute in some way to poverty reduction, food security and climate change response.

Those areas – accelerating the development of taxonomic resources, tools and technologies and contributing to an enabling policy environment and communications – are addressed below.

B. Accelerate the development of taxonomic resources, tools and technologies

The two predefined outcomes that correspond to the three objectives in this area of work are:

a) Taxonomists better understand end-user needs and the potential for using innovative approaches to addressing locally prioritised needs through taxonomic product development

30 The Business Plan does not mention "outcomes", "results" or "outputs" and only vaguely refers to intended "impact".

b) Taxonomists, through cooperation with technology partners and end-users develop and disseminate products to address poverty reduction, food security and climate change response needs

From our findings in evaluation question 2 and evaluation question 3, we see that taxonomists have been confronted with, educated by, and as a consequence better understand, the end-user needs, in (especially developing) countries influenced by BioNET. LOOPs have, in the main, responded to needs and opportunities to enhance the awareness and use of taxonomy when funding and other support was available; the Global Secretariat has provided technical and financial support when and where possible to the LOOPs.

Taxonomists can only make small contributions to these agendas under present circumstances; the contribution of taxonomists to poverty reduction and food security should not be overstated; they can contribute but only as part of broader agendas. Outcomes in relation to climate change have not been reported.

Although not listed as an expected outcome, the CABI Plantwise Initiative will have significant impact on the direction and activities of BioNET, which needs to be considered in detail for the next planning process for the Network.

C. Contribute to an enabling policy environment and communication

Question 3 addressed the four objectives under this area of BioNET work, which had many positive outcomes for the CBD and varying responses to the expected outcomes for the programme period. These were the two predefined outcomes:

a) Policy makers in the Convention on Biological Diversity and ABS and SPS regulators recognise the taxonomic products needed to implement Multilateral Environmental Agreements and achieve the MDGs

b) Taxonomists made aware of the policy and regulatory needs and have outreach materials to use when communicating the relevance of their work to the implementation of MEAs and achieve the MDGs.

c) The governments and authorities where taxonomic capacity is needed should include taxonomic capacity development programme in response to decision X/2 of the CBD COP, particularly in the process of revising its National Biodiversity Strategies and Action Plans.

In general, BioNET has produced some very significant outcomes for the CBD in terms of taxonomic content, organisation of the GTI and support with funding ideas in a sector of the Convention that receives little support compared to some others. While the MDGs have not received directed attention amongst the outcomes, the basic area of taxonomy at global and regional levels, through the BioNET secretariat and LOOP activities, has flourished in the last four years – given the prevailing financial constraints. Attention to ABS has hardly been mentioned due to the uncertainty before the ABS protocol was agreed in 2010, and the work in the area relevant to the SPS Agreement largely relegated to the future – but certainly not ignored.

The concern for some more practical taxonomy guidance and discussion at the CBD and associated MEAs has been stated and should be discussed in planning for the future as humanitarian needs, livelihood support and food security are globally important – now

and in the future. It should be possible to emphasise these aspects in the GTI of CBD while retaining connections to the more classical taxonomy that, to a certain extent, underpins all applied work in this area. This would include the SPS regulatory frameworks standard setting bodies, such as IPPC and OIE, and Standards and Trade Development Facility under the WTO, as well as the CBD and the other MEAs in working more directly towards the MDGs.

D – Mobilise resources and governance

This area of work had four predefined outcomes:

a) BioNET **donors** provide sufficient funding to allow taxonomic work on key developing country challenges including food security, poverty reduction and climate change adaptation.

b) The BioNET **LOOPs**, partners (entities working with BioNET) and other stakeholders (entities that share some goals with BioNET but are not working with the network) take action on the taxonomic impediment and GTI implementation.

c) The **BioNET Board** puts into place governance structures that serve as a platform for capacity building, cooperation and targeting key taxonomic issues.

d) BioNET's **allies** in influencing the CBD recognise BioNET as a leader in championing the GTI under the CBD.

In spite of doubling its income in 2007-2010 compared to the four years previous, BioNET was unsuccessful in persuading sufficient donors to provide enough funding to carry out the capacity building, advocacy, network building and taxonomic work it had planned. In addition to the increase in funding, we recognise that the Global Secretariat has developed a proactive strategic approach in developing a funding profile, rather than only responding to funding opportunities as these arise.

Nonetheless, in spite of the level of financing, the BioNET LOOPs were able not only to take action but as many of 103 LOOP-influenced outcomes demonstrate, they also contributed to important changes in other stakeholders key to the taxonomic impediment and the GTI.

From our perspective, the principal governance achievement of the BioNET board was seating two representatives of the LOOPs. Continuing to develop in this direction holds the potential for BioNET to empower its members and with that balance the current dominance of the Network by CABI.

Lastly, in our findings – through interviews in particular – it is clear that BioNET's allies recognise the network as the leader in championing the GTI. In fact, the GTI would not have survived without BioNET.

Additional recommended points for discussion

In these conclusions, we have woven in some points that we recommend for discussion. In the TORs and the evaluation design we agreed to see if the findings of the evaluation would enable us to recommend others specifically concerning the possibility that SDC will reorient its future financial support to aspects related to food security only, and

possibly only as a function of BioNET's contribution to CABI Plantwise. If that were to happen, we were asked:

> *"What insights do the evaluation findings provide for the changes that BioNET (Secretariat and LOOPs) should consider in the priority objectives for the network, their current strategies and programmes and what type of support from which type of sources would be needed to further develop the network to meet these priorities?"*

This is our answer: Food security is an all-embracing concept that involves much more that agricultural production, and the research that supports production, including elements such as access to markets, supply chains, dietary preference change and socio-economic circumstances, waste management etc. SDC investment in taxonomy in relation to food security (whether through BioNET or Plantwise) is unlikely to have direct impact, unless linked to some of the other elements above. Indeed, development interventions in general and networks in particular *contribute to* but do not directly have attributable impacts on food security (see page 3).

Insofar as the urgent need for agricultural research is a part of a food security agenda, then taxonomic services and support has a vital role to play because of the major impact of plant pests and diseases on food production. SDC investment in these aspects related to agricultural research will have a direct impact on production. The role of biodiversity in contributing to sustainable production (as recognised in the CBD) is another dimension of agricultural research where taxonomy is critical. **Does SDC have an equal commitment to the sustainability agenda?**

The suggestions for expanding the taxonomic support towards more applied agreements and international standard setting organisations is a practical response to global needs, but **can it be implemented without more funding and more global secretariat staff and facilities?** Or **could that be carried out through suggestions to the LOOPs to take on specific aspects of taxonomy in their different regions and exchange information between them?**

BioNET has an established reputation, expertise and track record in providing taxonomic services and products to end-users - for research in agricultural pest management and in biodiversity more generally. There is no doubt that the CBD GTI has received significant support from BioNET and that it appreciates that support and will continue to request it (directly or indirectly). With SDC funding directions changing, can BioNET expect the same level of support as in the past in order to continue its admirable support to the CBD? **Is SDC committed to the 10 plus year timeline that will be required for BioNET and Plantwise to evolve together in order to complement each other across these related areas?**

BioNET has a greater potential role on the humanistic aspects of livelihoods than those relating just to the biodiversity conservation and/or agricultural research agendas. **Would the restriction of BioNET to the Plantwise initiative remove this potential for impacts on livelihoods?**

ANNEXES

The annexes are in separate documents.

Annex 1 – Components of the BioNET network

Annex 2 – Terms of Reference for the BioNET Outcomes Evaluation 2007-2010

Annex 3 – BioNET's 105 member countries by regional LOOPs

Annex 4 – BioNET's Predefined Objectives and Outcomes, 2007-2010

Annex 5 – Design of the BioNET 2007-2010 outcomes evaluation

Annex 6 – Substantiation of ten outcomes selected by the evaluators

Annex 7 – BioNET documents consulted for outcomes 2007-2010

Annex 8 – BioNET Global Programme outcomes 2007-2010 by Global Secretariat and LOOPs

Annex 9 – BioNET Global Programme Outcomes 2007-2010 in numbers - Classified by Objectives

Annex 10 – BioNET Global Programme Outcomes 2007-2010, classified according to BioNET objectives and sub-objectives

Annex 11 – Summaries of Interviews for the BioNET Review Question No. 3