VALIDATION REPORT

OUTCOME STORIES FOR CIAT-CCAFS

PROJECTS IN COLOMBIA DURING 2014

Ricardo Wilson-Grau, 30 January 2014

Biographical Note on the Author of the Report

Ricardo Wilson-Grau is an independent evaluator and organizational development consultant supporting social change organizations, and in particular international networks and development donors. He resides in Brazil but works internationally. A graduate *magna cum laude* of the Universidad de Puerto Rico, he holds an MA in the political economy of development from Goddard College, Plainfield, VT, USA. Ricardo has worked in international development since the 1960s, including as a surveyor and community development worker in Colombia, field director for the American Friends Service Committee in Guatemala, director of the Latin American Programme of experiential Friends World College, journalist and managing director of Inforpress Centroamericana in Guatemala, senior manager with Greenpeace International in Amsterdam, and foreign aid advisor with Novib, the Dutch Oxfam. Since 2003, he has concentrated his work on the monitoring and evaluation of over two dozen international social change networks and the programmes of ActionAid, CARE, Doen Foundation, Hivos, IDRC, Ford, Oxfam Novib, PSO, the Open Society Institute, UN Trust Fund to End Violence Against Women, and the World Bank Institute. With colleagues, he developed the "Outcome Harvesting" tool that now has harvested thousands of outcomes of three hundred plus NGOs, CBOs, government agencies, multilaterals, research institutes and networks around the world. His organizational development work is primarily in adapting Outcome Mapping to the planning, monitoring and evaluation needs of networks.

I. Introduction

In November 2014, I engaged with five Colombian government staff to validate two Outcome Stories prepared by CIAT staff describing governmental changes that CIAT science had influenced. The first Story described how the Ministry of Agriculture and Rural Development (MADR)[1] and the Ministry of Environment and Sustainable Development (MADS) prioritized mitigation actions for the agriculture and livestock sector. CIAT's contribution was its scientific collaboration in 2013 and 2014 with the Colombian government to identify appropriate mitigation measures for the agricultural sector and establish the evidence base for the Colombian Low Emission Development Strategy (LEDS). The second Story described how the Colombian National Planning Department (DNP) developed detailed sector level adaptation plans in part as a result of CIAT researchers' measurement of the economic impacts of climate change in the water, biodiversity and livestock sector.

The purpose of the validation was to both verify and enrich the understanding of the influence of CIAT research in decision-making at the policy level.

II. Methodology

We used the CCAFS definition of an outcome:

> Medium-term changes in the practice of policy makers (or those influencing the policy process, e.g. policy advisors and advocacy agencies), national development agencies, national meteorological agencies, service providers to farmers including non-governmental agencies, and sometimes farmers themselves that occur through the adoption, use or influence of the research product.

This definition is compatible with that used in Outcome Harvesting,[2] a tool for identifying, formulating, verifying, analyzing and interpreting outcomes even when they have not been predefined. Thus, in each "outcome Story" is implied, if not explicit, a series of outcomes that together represent the processes of change that led MADR, MADS and DNP to take actions, influenced by CIAT science and which represent significant progress towards mitigation or adaptation to climate change.

Furthermore, an *indicator of outcomes* (see section III.3) is partial information about a significant change in another climate change stakeholder — who changed, what did they change, when and where. That is, unlike outcome statements, which are specific and measurable descriptions of demonstrated changes that can be verified, indicators are signs of potential outcomes.

We also adapted the Outcome Harvesting concept of *substantiation* — engagement with independent, knowledgeable third parties (i.e., not the protagonists of CIAT science with a

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[1] For abbreviations, see Glossary at the end.

[2] An August 2013 discussion paper from the UNDP evaluation office selected Outcome Harvesting as one of eleven promising innovations in monitoring and evaluation practice. A December 2013 USAID discussion note on Complexity-Aware Monitoring (and evaluation) chose Outcome Harvesting as one of five approaches especially well-suited for evaluation practitioners operating in dynamic, uncertain situations who need tools to monitor and evaluate the change and results they are achieving through interventions where relations of cause and effect are not fully understood. After ten World Bank Institute teams piloted a customised version of Outcome Harvesting last year, in June 2014 the WB published a booklet of the cases and now lists the tool amongst its resources for monitoring and evaluation.

vested interest in CIAT's achievement of outcomes) to confirm the veracity and enrich the understanding of CIAT science's contribution to the changes described in the two Outcome Stories.

The process was simple. I engaged through virtual and in-person interviews with five key informants in MADR, MADS and DNP recommended by CIAT staff in Colombia and obtained their opinion about:

- The evidence of CIAT science's policy influence as described in the two Outcome Stories.
- Their reasoning for taking the actions represented by the two stories.
- The potential they see for further changes in 2015.

Furthermore, I identified from the same informants indicators of changes during 2014 in the behavior, relationships, policies or practices of other actors that represent significant progress in mitigation or adaptation to climate change and which also were influenced in some way by CIAT science.

The research was carried out the week of 24 November in Bogotá, Colombia.

There were important **methodological limitations**. First, the exercise was to verify the outcomes and not the CIAT outputs that contributed to them. Concretely, the veracity of the section of the Outcome Stories titled "What is the outcome of the research (i.e. use of research results by non-research partners)?" was the sole focus of this validation.

The uses of the validation agreed with Dr. Genowefa Blundo Canto, CIAT Impact Assessment Officer and commissioner of this exercise, are to report to the Research Program on Climate Change, Agriculture and Food Security (CCAFS), learn from CIAT's activities and strategies in order to improve them, get some expert insight on how to achieve better results and how to validate them, but also obtain indications of other potential outcomes influenced by CIAT's research. Therefore, and second, we agreed that a minimum of 4 and a maximum of 10 people recommended by CIAT staff in Colombia as knowledgeable, independent-of-CIAT informants would provide good enough, credible evidence for those uses.

Third, CIAT staff in Colombia were only able to suggest 6 informants, two per institution; one of the informants (Silvia Calderon of DNP) eventually proposed two more. In the end, 5 of the 8 participated (see Annex I).

Fourth, the validation had to be completed by the middle of December and thus was carried out in an especially busy period of the year for the staff of the two ministries, the DNP and CIAT. Consequently, my engagement with each of the five informants was limited to approximately sixty minutes, either virtually or in a face to face interview. Four (Nestor Hernández of MADR, Olga Lucia Ospina of MADS, and Silvia Calderón and Diana Hernández of DNP) reviewed and approved the final text of the interviews.

III: Answers to the Validation Questions

III.1 CIAT –Outcome Story 2014 – LEDS Colombia

> ***<u>Validation question #1.1</u> To what extent do informants in the Colombian Ministry of Agriculture and the Ministry of Environment agree with Outcome Story I on how they used CIAT science in 2013-2014 to prioritize mitigation actions for the agriculture and livestock sector?***

The three informants were:

- Nestor **Hernández** Iglesias, the person responsible for supervising the implementation of the cooperation agreement between CIAT and MADR
- Nelson Enrique **Lozano** Castro, coordinator of the group for environmental sustainability and climate change, MADR
- Olga Lucia **Ospina** Arango, responsible for mitigation issues in agriculture in the Directorate of Climate Change, MADS

In the draft Outcome Story I, CIAT describes the outcome as:

> In 2014, the government is taking action to prioritize mitigation actions in fruit plantations and silvo-pastoral systems, leading to requests for more information and capturing the interest of policy makers. These actions are being drafted into two national mitigation actions (NAMAs) by LEDS Colombia, MADR and MADS with a process focused on multiple stakeholders engagement.

The informants clarified that it is one NAMA that has been approved in 2014 and not two:

> In 2012, the MADR and MADS, based on the findings and recommendations of studies in which CIAT was involved,* decided to prioritize two NAMAs. The ministries contracted with CIAT to prepare technical studies with primary information on the viability of these NAMAs. In 2014, these CIAT technical studies helped the MADR to draft a NAMA for the reconversion of pastures back into fruit crops, which was approved by the MADS.
>
> ** Evaluación de flujos de inversión y financiamiento para acciones de mitigación y adaptación en el Sector Agropecuario, CIAT & UNDP (2011) and Reduction of Carbon Emissions in Colombia, World Bank and DNP (2012)*

Ospina says that the two ministries have not yet approved the draft NAMA.

Regarding the specific contribution of CIAT science to the NAMA, the draft Outcome Story I states:

> Supporting the decision-making process, CIAT researchers have worked closely with the Colombian government to identify and prioritize [the] most efficient mitigation measures. Specifically, a study led by CIAT with the United Nations Development Program (2011) identified regions with highest potential for silvo-pastoral systems and improved pastures; analyzed how to reduce nitrogen fertilizer use in rice; and modeled suitable locations for avocado and mango cultivation.

The informants were not unanimous in their view of the extent to which the NAMA took up these specific CIAT findings.

Concretely, to what extent did the NAMA adopt these CIAT findings?	*Fully*	*Partially*	*Not at all*
1. The identification of regions with highest potential for silvo-pastoral systems and improved pastures.	NL	NH, OO	
2. The analysis of how to reduce nitrogen fertilizer use in rice.	NL	OO	NH
3. The modeling of suitable locations for avocado and mango cultivation.	NH	NL, OO	
4. Furthermore, to what extent did the NAMA include the World Bank study's recommendations for the intensification of livestock production through silvo-pastoral systems, improved pastures and fruits to promote better land use and competitiveness?		NH, OO, NL	

KEY: OO = Olga Lucia Ospina Arango, NL = Nelson Enrique Lozano Castro, NH = Nestor Hernández Iglesias

The informants explained some of their "partially" or "not at all" opinions. Concerning the identification of regions with the highest potential for silvo-pastoral systems and improved pastures, Ospina explains that CIAT/UNDP findings are being complemented by those from other sources, including Corpoica (Corporación Colombiana de Investigación Agropecuaria), UPRA (Unidad de Planificación Rural Agropecuaria, MADR) the Universidad Nacional and the Universidad de la Amazonía. Regarding the analysis of how to reduce nitrogen fertilizer use in rice, Hernández explained that the national mitigation action addresses other products. Third, Lozano says that the results of the study on modeling of suitable locations for avocado and mango cultivation have to be reviewed because the impact is not as high as originally thought. Fourthly, Lozano also explains that the intensification of production does not depend on the government. The National Development Plan has included a goal for silvo-pastoral systems but its implementation will depend on the agricultural and livestock producers.

> ***Validation Question #1.2: What do the MADR and MADS informants consider were the changes in knowledge, attitude, skills and practice that explain why the ministries' decision-makers decided to take the action described to mitigate or adapt to climate change?***

The three informants agreed that CIAT supported the **acquisition of new knowledge** and some changes in **attitudes** and others in **skills** on the part of staff and contracted workers of both ministries.

Knowledge: Lozano emphasized that having this knowledge from CIAT science was critical to enabling MADR to propose the action plan. Ospina says that the new knowledge was acquired at all levels of the ministry, from the headquarters in Bogotá to regional and local offices.

Attitudes: Hernández, echoing Lozano's comment, said that the new knowledge enabled the ministry staff to change the way they approached climate change and dare to commit themselves in the area. Lozano added that the program of collaboration with CIAT enabled

the MADR to engage in greater inter-institutional coordination and to position itself closer to the producers' associations[3]. Ospina did not identify any changes in attitudes.

Skills: Hernández insists that rather than changes in skills or attitudes, CIAT influenced a change in knowledge. Lozano notes that the MADR climate change team developed its technical ability: "We are still not experts but now speak with more authority and wield arguments about climate change." Ospina believes one concrete skill that came thanks to CIAT is the ability to identify and structure national mitigation actions.

CIAT's specific means of contributing to those changes was multipronged. All three believe that CIAT's scientific analysis of the MADR staff was a major means for contributing. Hernández and Lozano believe the same for CIAT's training although Ospina believes training only contributed a little to the changes in knowledge, attitudes and skills. Lozano and Ospina believe CIAT presentations made a major contribution but Hernández considers they only contributed a little.

In addition, Hernández mentioned CIAT's work with the three producers' associations — Fedearroz (Federación Nacional de Arroceros), Fenalce (Federación Nacional de Cultivadores de Cereales y Leguminosas) and Fedepalma (National Federation of Oil Palm Growers) — as being an important contributing factor. Lozano is impressed with CIAT's promotion of South-South exchanges and mentioned MADR staff's visit to Senegal as an example. He also mentioned CIAT's facilitation of the relationship of MADS with the Global Environmental Facility (GEF). Ospina says CIAT's information broker role is another important factor.

Equally important, the three informants pointed to **other contributing factors** that enabled the ministries to develop and agree on the NAMA for the reconversion of pastures back into fruit crops. Hernández mentioned the growing awareness in MADR that the agriculture and livestock sector is one of the principal sources of greenhouse gases. Lozano pointed to the growing interest of organized fruit producers associated with the Corporación Biotec, a biotechnology and technological innovation company. Ospina pointed out that her ministry (MADS) has been leading the Colombian strategy for low-carbon development (ECDBC) with priority for the agricultural sector. Furthermore, there are international donors supporting national initiatives such as the Sustainable Livestock Project for which the UK government has provided 15 million pounds sterling. In sum, the outcomes were enabled by increased interest, awareness, knowledge and funding apart from CIAT's contribution.

> ***Validation Question #1.3: What do these key informants within the ministries of agriculture and the environment consider could be possible new outcomes flowing from those mitigation actions in 2015?***

Lozano identified ten new outcomes from three key climate change actors in the coming year that he believes will flow from the NAMA:

1. Fedearroz would take four actions:

- Conduct site-specific agricultural soil analysis for the five major rice growing areas
- Develop a calibrated rice model to estimate the potential effects of climate on three new rice varieties

For traditional and so-called AMTEC[4] rice, measure:

[3] Amongst the nine partners of the CIAT-MADR collaboration agreement ('*convenio'*) are Fedearroz and Fenalce, the national rice and cereal and legumes growers associations. In addition, MADR collaborates with Fedepalma, the palm oil producers' association.

- Emissions of greenhouse gases
- Carbon footprint

2. Fedegan (Federación Colombiana de Ganaderos) will take three actions:

- Establish cattle's carbon footprint and make recommendations on how to reduce it

For the most important cattle producing zones:

- In the light of the environment in each zone, recommend changes in the cattle system that will permit the most efficient but intensive cattle raising models
- Six month climate prognosis

3. Cenicaña (Centro de Investigación de la Caña de Azúcar de Colombia), in the Department of the Valle de Cauca will measure:

- Emissions of greenhouse gases
- Carbon footprint
- The hydrological footprint

Hernández believes that Fedearroz, Fenalce, Fedepalma, Fedegan (Federación Colombiana de Ganaderos) and Fedepanela (Federación Nacional de Productores de Panela) will take action to incorporate the climate component into its production planning. He also considers that the staff of MADR, MADS, the DNP and IDEAM (Instituto de Hidrología, Meteorología y Estudios Ambientales de Colombia) will take climate change into account.

For her part, Ospina reports that MADS will produce a forestry NAMA. In addition, MADS will regionalize mitigation actions; for example, MADS proposed regionalizing actions in Antioquia for forestry.

In summary

I have validated with three authoritative, independent sources that in 2014 the ministries of agriculture and the environment have made a commitment to prioritize national mitigation actions for the reconversion of pastures back into fruit crops through a formal although still-to-be-published NAMA, a decision to which CIAT science contributed in a significant way through a diversity of activities. Furthermore, according to the informants this NAMA will potentially spark a number of changes in the behavior, activities, policies or practices of half a dozen other major actors in the agricultural and livestock sector of Colombia.

III.2 CIAT – Potential Outcome Story 2014 - General Equilibrium Model

<u>Validation Question #2.1</u> To what extent do informants of the Colombian National Planning Department (DNP) agree with the Outcome Story II of how they used CIAT science to take into account the economic impacts of climate change in the water, biodiversity and livestock sectors in technical and political discussions, and in budget planning?

The two informants were:

- Silvia L. **Calderón** Díaz, coordinator of the study *Impactos Económicos del Cambio Climático en Colombia*[5], DNP

[4] Rice cultivated through massive adoption of technology.
[5] Economic Impacts of Climate Change in Colombia

- Diana **Hernández** Gaona, coordinator of the Plan Nacional de Adaptación al Cambio Climático, DNP

The informants corrected and expanded on the original Outcome Story II and validated that significant actions were taken by the DNP in 2014 with the support of CIAT science.

The original outcomes identified and formulated by CIAT was:

> In 2014, the Colombian National Planning Department (DNP) a) promoted technical and political discussions on climate change and b) included sub-sectoral plans for climate adaptation in the Budget for 2015 based on the study *Impactos Económicos del Cambio Climático en Colombia* del DNP, which in turn was based on CIAT research on livestock, biodiversity and water resources.

The two DNP informants identified and formulated three outcomes:

> In 2013 and 2014, the National Planning Department (DNP), in addition to promoting technical and political discussions on climate change:.
>
> a) Prepared in conjunction with MADR a draft investment proposal on adaptation and mitigation of climate change for the agricultural sector.
>
> b) Included in the National Development Plan 2014-2018 a strategy for climate-smart agriculture and a goal related to this strategy. This strategy was based on, among other sources, the DNP's study *Impactos Económicos del Cambio Climático en Colombia*, which in turn was based on research contracted with CIAT on livestock, biodiversity and water resources.
>
> c) Prepared along with MADS, IDEAM and UNGRD (Unidad Nacional para la Gestión del Riesgo de Desastres) who are the coordinators of the National Plan for Adaptation to Climate Change, the strategy for 2015-2025 that incorporates in its diagnosis and proposals for adaptation CIAT-informed results of the study *Impactos Económicos del Cambio Climático en Colombia*. As of 15 December 2014 this plan had not been formally approved.

In sum, CIAT contributed directly and especially indirectly to more and somewhat different changes than described in the second draft Outcome Story II that I was asked to validate.

What CIAT contributed necessarily varied depending on whether it refers to the DNP's strategy for climate-smart agriculture in the National Development Plan 2014-2018 or to the National Plan for Adaptation to Climate Change. Although the Outcome Story II changed, I explored with both informants the nature of CIAT's contribution.[6]

[6] The original Outcome Story cited CIAT research "on the effects of climate change in three sectors: livestock, water resources and biodiversity, specifically native species for bio-commerce and other uses" and "a downscaling method developed by CIAT researchers for assessing impacts of climate change on agriculture at fine scales."

To what extent did the DNP use CIAT science about the effects of climate change on::	Silvia L. Calderon Díaz, coordinator of the study *Impactos Económicos del Cambio Climático en Colombia*, DNP		Diana Hernández Gaona, coordinator of the National Plan for Adaptation to Climate Change, DNP	
	For a) and b)		*For a), b) and **c)***	
	Fully	***Partially***	***Fully***	***Partially***
1.1 Livestock?	**X**		**X**	
1.2 Water resources?	**X**			**X**
1.3 Biodiversity: native species for bio-commerce and other uses?		**X**		**X**
	*To what extent did the study **Impactos Económicos del Cambio Climático en Colombia**…*		*To what extent did the **National Plan for Adaptation to Climate Change (PNACC):***	
1.4 Apply a downscaling method developed by CIAT researchers for assessing impacts of climate change on agriculture at fine scales (with reference to the Ramírez-Jarvis studies)?		**X**	*Does not apply to the PNACC*	
1.5 Promote technical discussions based on the CIAT reserach on the livestock, water resources and biodiversity sectores?	**X**		**X**	
1.6 Promote political discussions based on the CIAT reserach on the livestock, water resources and biodiversity sectores?	**X**			**X**

Both informants agree that for the four outcomes, the DNP utilized CIAT science on climate change but clarify some of the limitations. Both agree the science on livestock was fully used. Calderon says the water resources data and analysis was fully used too but Hernández G. says only partially. They both say CIAT science on biodiversity was used but solely partially.[7]

[7] The classification as 'partial' was in the sense that not all CIAT science on the topic was used.

Calderon also says that the *Impactos study* partially used the downscaling method developed by CIAT researchers for assessing impacts of climate change on agriculture at fine scales, explaining that it was not used for livestock. Hernández G. says the downscaling method was not applicable to the National Plan for Adaptation to Climate Change and therefore not used. Regarding DNP's use of CIAT science to take into account the economic impacts of climate change in technical and political discussions on livestock, biodiversity and water resources, Calderon fully agrees that the DNP did use CIAT science in such discussions.

Hernández G. agrees concerning the technical discussions but only partially agrees that the DNP promoted political discussions on these three topics.

> ***Validation Question #2.2: What do these DNP informants consider were the changes in knowledge, attitude, skills and practice that explain why the DNP's decision-makers decided to take action to mitigate or adapt to climate change?***

Both informants consider that CIAT supported the acquisition of **new knowledge** and to lesser extent of new **skills**. Calderon identified an important **attitudinal change** that was behind the outcomes.

Knowledge: Calderon said that previous to CIAT's contribution, the DNP team did not have economic data on climate change in the water, biodiversity and livestock sectors and now they do.

Hernández G. specified changes for three of the outcomes. Regarding the draft investment proposal (a), she said that for colleagues from the Directorate of Rural Development in the MADR, CIAT information provided clarity regarding the type of policy interventions that must be carried out to adapt the sector.

For the climate-smart agriculture strategy (b), CIAT provided similar clarity for other actors within the DNP and in the MADS, and others who participated in discussions to formulate the National Development Plan 2014-2018.

Thirdly, members of the coordinating committee of the National Plan for Adaptation to Climate Change (c) became clearer about the chain of events that leads to impacts on agricultural and livestock activities as a result of the new conditions projected in the climate change scenarios.

Attitudes: Calderon explained that with economic data in hand, there is evidence with which to justify public policies. Thus, the DNP team was able to take much more seriously the idea that you cannot plan for the agricultural sector without talking about climate.

Skills: Calderon says the DNP team has acquired the technical ability to apply the knowledge about climate impact to the design of public policies. Hernández G., echoing Calderon's logic concerning attitudinal change, says that although the data is estimated, the team is able to use the information concerning the magnitude of potential impact as decision-making criteria.

Both informants agreed that **CIAT's specific means of contributing** was through the scientific analysis and presentations but not through staff training.

They also listed six **other contributing factors** for an enabling environment for the DNP to make the decisions behind the four outcomes.

Silvia Calderon:

> 1) CIAT is important but other contributors included individual consultants (e.g., Francisco Boshell), and institutions such as UNDP, UNEP, GIZ.
>
> 2) The 2010-2011 La Niña also highlighted the importance of climate change.

3) The interest of producer associations to understand how to mitigate and adapt to climate change was a third factor.

Diana Hernández:

4) There is a national context that encourages many governmental and civil society actors, such as the universities, to become involved in discussions on mitigation and adaptation to climate change, in order to understand the issues and participate in the response.

5) The National Development Plan for the period 2010-2014 stipulates the need for the agricultural sector to formulate a sectorial adaptation strategy, while the norm that regulates the Plan's implementation (Law 1450 of 2011 in Article 217) states that national entities should develop adaptation strategies. Consequently, government agencies and universities have been primed to take action on climate change.

6) The National Development Plan provides an umbrella for the actions that led to the National Plan for Adaptation to Climate Change.

Validation Question #2.3: What do these key DNP informants consider are the outcomes — concrete actions — that will or might develop in 2015 based on the technical and political discussions and budget planning?

In the light of the modifications in Outcome Story II, I expanded this question to include all four outcomes, a to d, identified by the two informants.

Silvia Calderon identified two outcomes that she believes will flow in 2015 from DNP's actions in 2014:

1. The DNP is going to undertake regional studies about the impact of climate change.

2. MADR will prioritize zones and productive systems in which to implement the adaptation strategy for the agricultural sector contained in the National Development Plan.

3. MADS will carry out regional vulnerability studies and formulate adaptation plans.

Diana Hernández also identified another two:

3. Agricultural sector actors such as UPRA (Unidad de Planificación Rural Agropecuaria) of the MADR and Finagro (Fondo para el financiamiento del sector agropecuario) will take 'climate-smart agriculture' action as proposed in the National Plan for Adaptation to Climate Change.

4. Private entrepreneurs will prioritize investments in the forestry sector to take advantage of biodiversity resources because this sector is less susceptible to climate change than more conventional agricultural activities.

In summary

I have validated with two authoritative, independent sources that in 2014 the Colombian National Planning Department (DNP) used CIAT science to take into account the economic impacts of climate change in the water, biodiversity and livestock sectors through four distinct actions. The DNP promoted discussions on climate change, co-drafted a proposal for Colombian government to invest on adaptation and mitigation of climate change for the agricultural sector, included a strategy for climate-smart agriculture in the 2014-2018 National Development Plan, and prepared with others a 2015-2025 national strategy for adaptation to climate change. CIAT science, especially on livestock but also to a notable

extent on water resources and biodiversity, contributed to these changes by providing new knowledge, to a lesser degree enhanced skills and at least one important attitudinal change for the DNP decision-makers. The four DNP outcomes promise to lead to four new changes in 2015 in the DNP, in MADR and amongst private investors.

III.3 Do the informants see any indication that other social actors have taken action or changed their policies or practices in 2014 as a result of using CIAT science?

All five informants identified a number of indicators of potential outcomes that they consider in some way CIAT science may have influenced in the course of 2014. This is the list with the respective informant's initials in parentheses.

1. Donors and multilateral agencies including the governments of Norway, Germany and England in the project Visión Amazonía, and USAID, GTZ and the UNDP have decided to direct their investments and resources for the agricultural sector through the Ministry of Agriculture rather than the Ministry of Environment as they were doing previously. (NH) The UNDP in the Nariño Department is implementing a territorial project to analyze the economic impact of climate change. (SC)

2. Other Colombian agencies (including DNP, MADS, Ministry of Foreign Affairs) are recognizing MADR as a 'valid interlocutor' on issues related to climate change and variability and to the formulation of public policy on environmental issues. (NH)

3. Producers associations and research centers including Cenipalma (Research Centre for Oil Palm), Cenicel (Fenelace's research center) and Corpoica have incorporated the climate dynamic (climate change, climate variability, local climate and their interactions) into their programmatic agendas. (NH, SC)

4. The producer associations Fedepapa (Colombian Federation of the Potato Producers) and Fedepalma are taking steps to address climate change. For example, the members of Fedepapa are training all their professionals in this topic. (NL)

5. Corpoica formed a climate change team and incorporated climate change issues into its action plan. (NL)

6. The Ministry of the Environment's Instituto Alexander von Humboldt has used CIAT science for plant conservation research. (OS, SC)

7. The IDEAM, also affiliated with the Ministry of the Environment has taken the initiative to share information with CIAT and incorporated climate change into its own research agenda. (OS, SC)

8. Reportedly, the Universidad Nacional, Federacafé (Federación Nacional de Cafeteros de Colombia) and some environmental NGOs such as (GASA (Gestión Ambiental y Servicios Agropecuarios in Manizales) have taken action influenced by CIAT work but precisely what they have done is uncertain. (OS, SC)

9. Fedearroz; and CIPAV (Fundación Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria), appear to have all taken some undefined action influenced by CIAT. (SC)

10. UNEP (PNUMA), in addition to collaborating on the Regata project with CIAT, has taken the initiative on its own to launch the Micro-Finance for Ecosystem-Based Adaptation project. (SC)

11. MADS is working on territorial adaptation plans with an emphasis on the agricultural sector. (SC)

12. The UNGRD (Unidad Nacional para la Gestión del Riesgo de Desastres) is taking action based on the understanding that the different types of climate impact and resulting loss and damage are not all associated with extreme events but also are due to permanent and gradual climate change. (DH)

13. The development banks (Finagro, Findeter, Fonade) have adopted more flexible financing criteria and now invest in knowledge generation, instead of solely tying funds to expected material results. (DH)

14. MADS is integrating scientific studies with decision-making on adaptation to climate change. (DH)

It is important to note that all these are at best potential outcomes. To meet Outcome Harvesting's rigorous criteria for credible, verifiable outcomes, they would have to be formulated in a manner that meets these 'SMART' criteria:

- **S**pecific: The outcome is formulated in sufficient detail so that someone without specialized subject or contextual knowledge will be able to understand and appreciate *who* changed *what*, *when* and *where* it changed, and how CIAT contributed.
- **M**easurable: The description of the outcome contains objective, verifiable quantitative and qualitative information. How much? How many? Precisely when and where did the change happen?
- **A**chieved: The description establishes a plausible relationship and logical link between the outcome and the change agent's — CIAT's — actions that influenced it. In other words, how did CIAT science contribute to the outcome, in whole or part, indirectly or indirectly, intentionally or unexpectedly?
- **R**elevant: The outcome represents a significant step towards the impact that CIAT seeks. Those who identify and formulate the outcome and CIAT's contribution must be well placed to assess both. They should have a special position or experience that gives them the requisite knowledge to describe the outcome and how CIAT contributed.
- **T**imely: First, the outcome must have occurred within the time period being monitored or evaluated — in his case since January 2014 —, although CIAT's contribution may have occurred months, or even years, before.

Once the outcomes are SMARTly formulated, CIAT would decide if some or all need to be validated, which will depend on the credibility required for the intended use of this evidence of CIAT's achievements. Only when CIAT has in hand a set of credible outcomes would it proceed to analyze and interpret them to reveal and explain the processes and patterns of change in mitigation and adaptation to climate change in Colombia to which CIAT science is contributing.

In summary

There are solid indicators of potential outcomes that CIAT science influenced in 2014 in a wide range of other national and international actors in both the public and private sector. In addition, these signs of outcomes suggest that possibly CIAT has contributed to a much richer web of progress in Colombia on adaptation or mitigation in the face of climate change than what CIAT itself was aware.

IV. Conclusions

Based on the authority of the five informants, I have verified that in 2014 CIAT science has influenced decision-making at the policy level in the Colombian Ministry of Agriculture and Rural Development (MADR), the Min Ministry of Environment and Sustainable Development (MADS) and the National Planning Department (DNP). Specifically, and in order of importance for this validation exercise:

1. In 2014, MADR drafted a national mitigation action (NAMA) for the reconversion of pastures back into fruit crops, which was approved by the MADS. CIAT's influence on this decision was primarily through the knowledge it provided decision-makers in the form of technical studies, training of MADR staff and presentations, along with international networking and knowledge brokering.

2. Equally important, this outcome promises to have a wave effect with rice producers, cattle ranchers and other agricultural actors poised to take significant actions in 2015 to mitigate the effects of, or adapt to, climate change.

3. The DNP took four initiatives to adapt and mitigate climate change: promoted discussions on the topic; in conjunction with MADR, drafted an investment proposal; included a strategy for climate-smart agriculture in the National Development Plan 2014-2018; and prepared with other actors a climate adaptation strategy for 2015-2015. CIAT science also contributed to these actions, again primarily by influencing changes in the knowledge of DNP decision-makers and their staff about the economic impacts of climate change on agriculture. The CIAT contribution was delivered through scientific analysis and presentations but not through training of DNP staff.

4. The foreseeable effects of these DNP outcomes in 2015 in Outcome Story II are more ripples than waves, at least in comparison to Outcome Story I. DNP will undertake regional studies of climate change and the MADR and others will take 'climate smart agriculture' actions. The business community can be expected to give more attention to investment in the relatively climate-safe forestry sector.

5. The corrections of the two Outcome Stories plus the large number of other potential outcomes identified by the informants suggest that CIAT's current procedures for monitoring and evaluating its achievements on the level of outcomes is deficient.

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Glossary of Abbreviations

AMTEC — Agricultural Machinery Testing and Evaluation Center, University of the Philippines

CCAFS — CGIAR Research Program on Climate Change, Agriculture and Food Security

Cenicaña, Centro de Investigación de la Caña de Azúcar de Colombia, Colombian Sugarcane Research Center

Cenicel — Fenelace's research center

Cenipalma — La Corporación Centro de Investigación en Palma de Aceite, Research Centre for Oil Palm

CIAT — Centro Internacional de Agricultura Tropical

CIPAV — Fundación Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria

Clayuca — Consorcio Latinoamericano y del Caribe de Apoyo a la Investigación y al Desarrollo de la Yuca

Corpoica — Corporación Colombiana de Investigación Agropecuaria (Colombian Corporation for Agricultural Research)

Corporación Biotec — A biotechnology and technological innovation company

DH — Diana Hernández Gaona

DNP — Colombian National Planning Department

ECDRC — Estrategia Colombiana de Desarrollo Bajo en Carbono

Fedearroz — Federación Nacional de Arroceros

Fedegan — Federación Colombiana de Ganaderos, Colombian Federation of Cattle Ranchers

Fedepalma — National Federation of Oil Palm Growers

Fedepanela — Federación Nacional de Prodcutores de Panela, National Panela Producers' Federation

Fedepapa — Colombian Federation of the Potato Producers

Federacafé — Federación Nacional de Cafeteros de Colombia

Fenalce — Federación Nacional de Cultivadores de Cereales y Leguminosas

Finagro — Fondo para el financiamiento del sector agropecuario

Findeter — Financiera de Desarrollo Territorial S.A.

Fonade — Fondo Financiero de Proyectos de Desarrollo

Fundación Biofuturo

Fundesot — Fundación para el Desarrollo Sostenible Territorial

GASA — Gestión Ambiental y Servicios Agropecuarios

GEF — Global Environmental Facility

IDEAM — Instituto de Hidrología, Meteorología y Estudios Ambientales de Colombia, Institute of Hydrology, Meteorology and Environmental Studies of Colombia

PNACC — National Plan for Adaptation to Climate Change

MADR — Ministry of Agriculture and Rural Development

MADS — Ministry of Environment and Sustainable Development

NAMA — National Mitigation Action plan

NH — Nestor Hernández Iglesias

NL — Nelson Enrique Lozano Castro

OO — Olga Lucia Ospina Arango

SC — Silvia L. Calderon Díaz

UNEP (PNUMA) — United Nations Environmental Program

UNGRD — Unidad Nacional para la Gestión del Riesgo de Desastres

UPRA — Unidad de Planificación Rural Agropecuaria, MADR

ANNEX I - Biographical sketches of informants

Name: Olga Lucia Ospina Arango
Post and institution: In charge of mitigation issues in Agriculture and Forestry, Colombian Ministry of Environment and Sustainable Development , Department of Climate Change
Email: olospina@minambiente.gov.co
She has known CIAT for years for the research it carries out, but directly from January 2013. She does not have a contractual working relationship with Jeimar Tapasco. They share an interest in the subject of climate change adaptation and mitigation in the agriculture sector.

Name: Silvia L. Calderón Díaz
Post and institution: Coordinator of Studies on the Economic Impacts of Climate Change del, DNP
Email: scalderon@dnp.gov.co
She knows CIAT since January 2013. In 2012-13 DNP hired CIAT and that is how she came to know Andy Jarvis and Jeimar Tapasco. The contractual agreement was on a study about the economic impacts of climate change in the livestock secotr, water resources and native species.

Name: Diana Hernández
Post and institution: Coordinator of the National Adaptation Plan, DNP
Email: dhernandez@dnp.gov.co
She knows CIAT since 2008. In 2012-13 DNP hired CIAT and that is how she came to know Andy Jarvis and Jeimar Tapasco. The contractual agreement was on a study about the economic impacts of climate change in the livestock sector, water resources and native species.

Name: Nelson Enrique Lozano Castro
Post and institution: Coordinator of the Group on Environmental Sustainability and Climate Change, Colombian Ministry of Agriculture and Rural Development
Email: nelson.lozano@minagricultura.gov.co
He knows CIAT since January 2014 and has a working relationship with Jeimar Tapasco as supervisor of the Agreement CIAT-MADR. The subject of their work is climate change, adaptation and mitigation in the agricultural sector.

Name: Néstor Hernández
Post and institution: CIAT Contractor, Supervision and Support to the Group on Environmental Sustainability and Climate change of the MADR
Email: nestor.hernandez@minagricultura.gov.co
He is a CIAT contractor responsible of supporting the supervision of the Agreement CIAT-MADR. His relationship with Jeimar Tapasco lies in this responsibility.