Comment accélérer la domestication du Tsiperifery à Madagascar?

Innovation participative et accompagnement du changement

Jérôme Queste, Jean-Michel Leong PockTsy, Mathieu Weil, Francine Ramahavalisoa, Norotiana Rasambo, Harizoly Razafimandimby

Ce document a été réalisé dans le cadre du projet INTERREG-V Qualinnov qui est cofinancé par l'Union européenne et la Région Réunion.

Sciences, Natures,Sociétés

- Comment les activités de recherches contribuent-elles à « changer le monde »?

- Evolution du paradigme de l'innovation pour l'agroalimentaire
  - 1970's (révolution verte) Transfert de technologie
  - 1990's (libéralisation) Services d'appui privés / subventions
  - 2010's (agroécologie) ???

- Répondre à des enjeux **de société** complexes
  - Changement climatique, biodiversité, inégalités sociales, paysages, risques sanitaires, gaspillage

Repenser les interactions entre scientifiques, opérateurs économiques, acteurs publics et sociétés

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Résultats du programme Impress au Cirad

LE TEMPS DE L'INNOVATION

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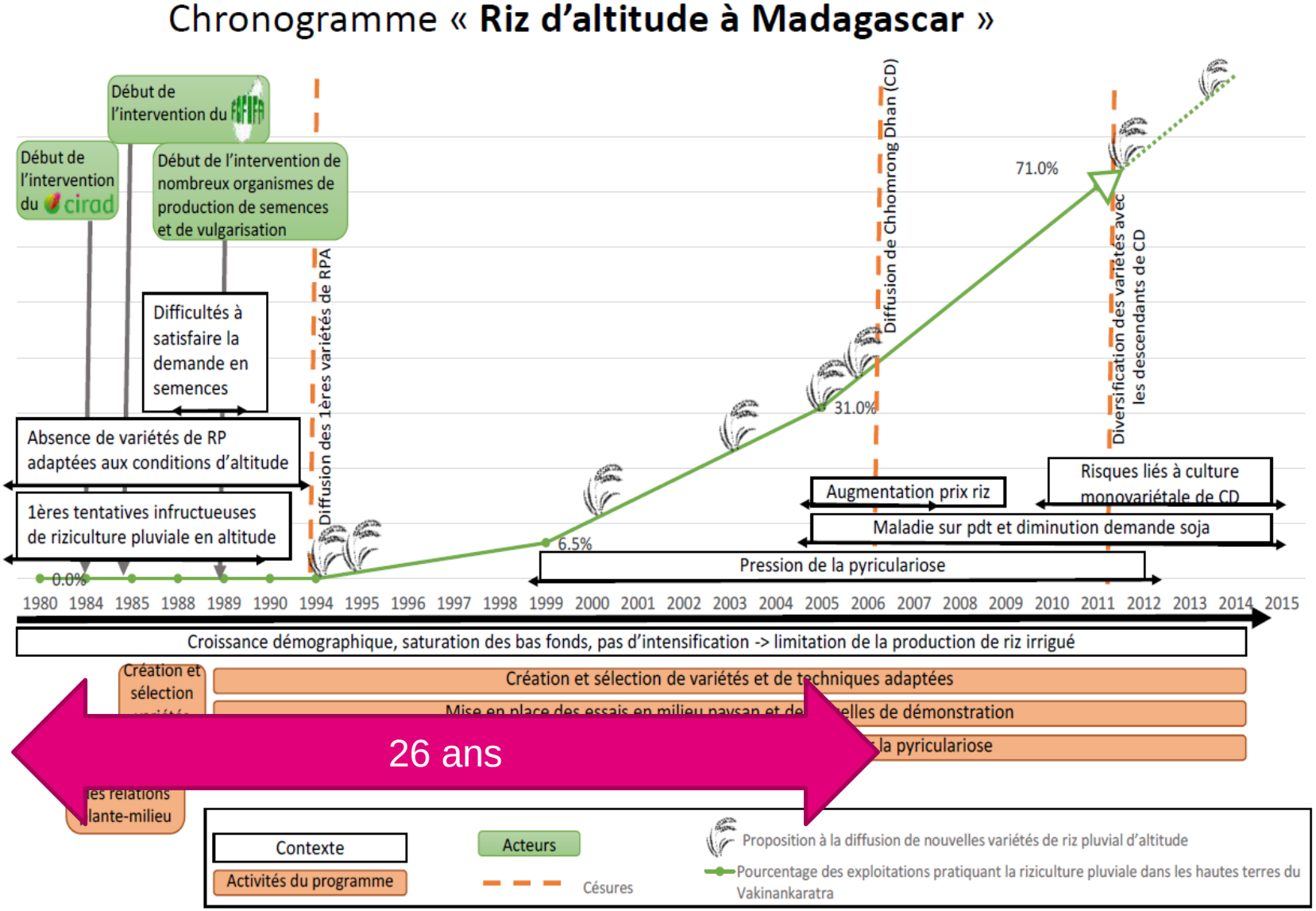
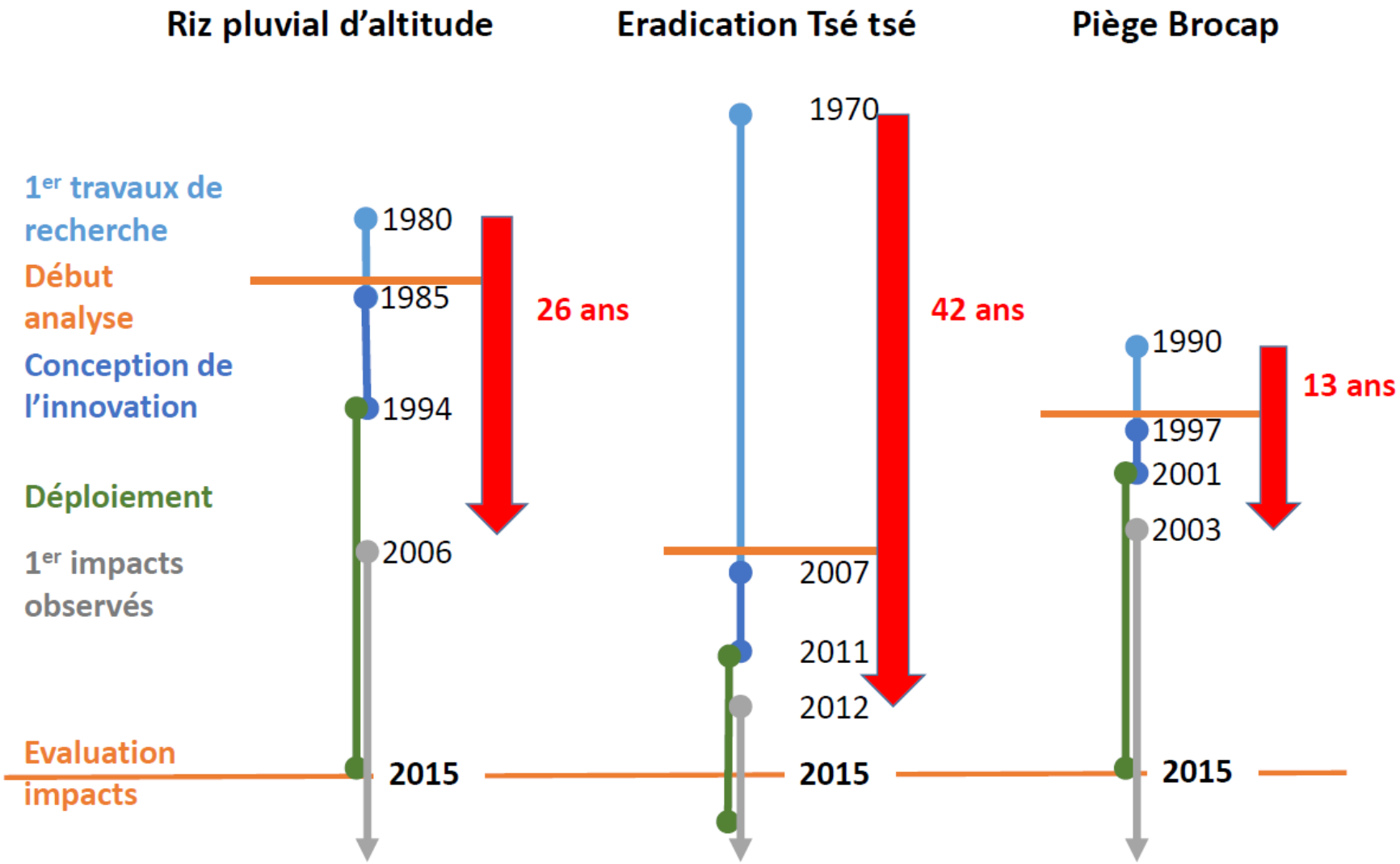
Le temps de l'innovation (1/2)



Le temps de la recherche (2/2)



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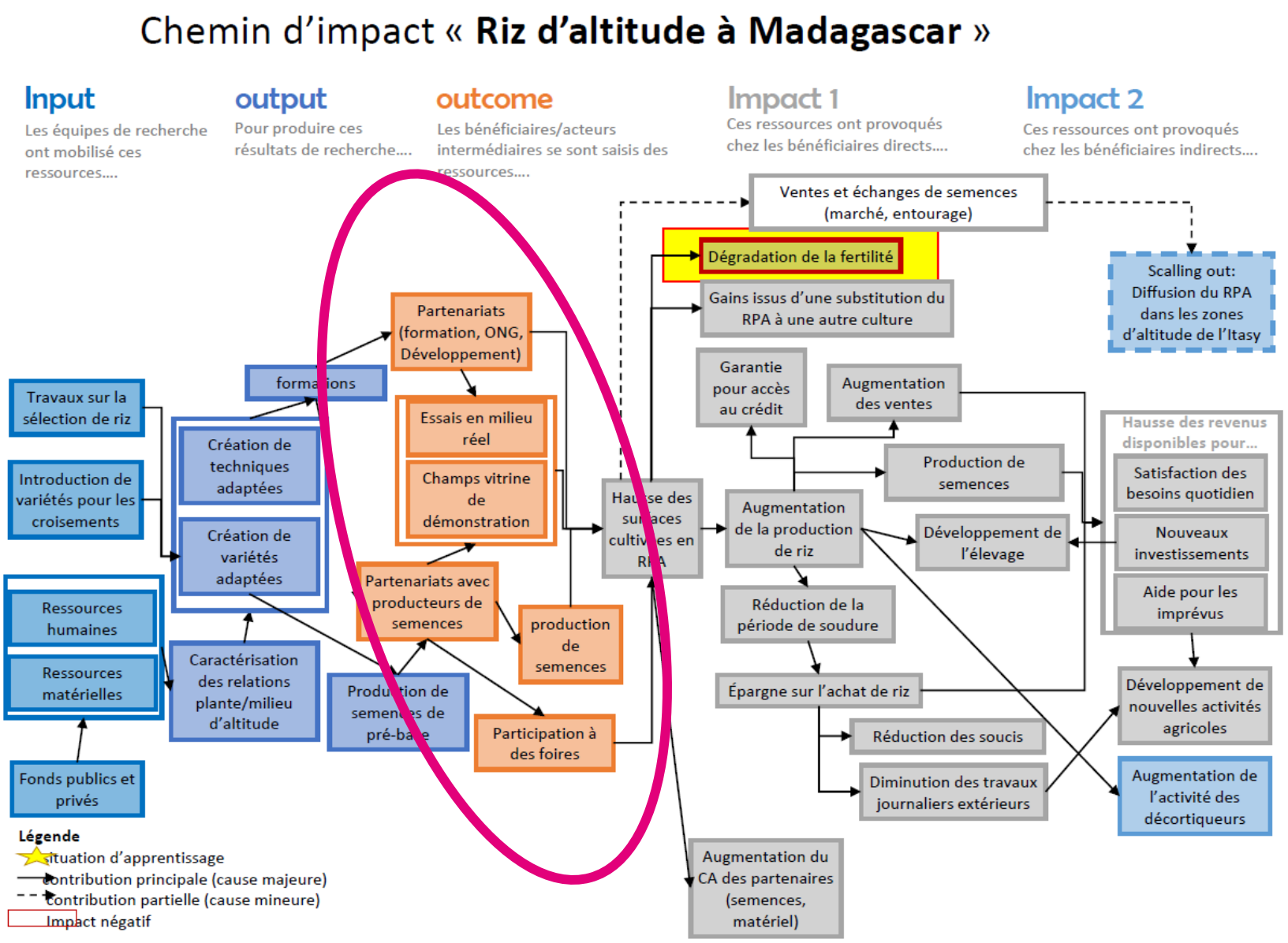
Les interactions et l'innovation



Détour par la bibliographie

COMMENT AMÉLIORER L'EFFICACITÉ DE LA SCIENCE?

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Des systèmes de connaissance (Cash et al. 2003)

Knowledge systems for sustainable development

David W. Cash*†, William C. Clark*, Frank Alcock*, Nancy M. Dickson*, Noelle Eckley‡, David H. Guston§, Jill Jäger¶, and Ronald B. Mitchell‖

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Communicated by Susan Hanson, Clark University, Worcester, MA, March 7, 2003 (received for review February 25, 2003)

The challenge of meeting human development needs while protecting the earth's life support systems confronts scientists, technologists, policy makers, and communities from local to global levels. Many believe that science and technology (S&T) must play a more central role in sustainable development, yet little systematic scholarship exists on how to create institutions that effectively harness S&T for sustainability. This study suggests that efforts to mobilize S&T for sustainability are more likely to be effective when they manage boundaries between knowledge and action in ways that simultaneously enhance the salience, credibility, and legitimacy of the information they produce. Effective systems apply a variety of institutional mechanisms that facilitate communication, translation and mediation across boundaries.

A capacity for mobilizing and using science and technology (S&T) is increasingly recognized as an essential component of strategies for promoting sustainable development (1–3). Efforts to enhance such capacity over the past quarter century range from developing more efficient cook stoves for burning biomass, to nurturing an international system for agricultural research, to applying S&T to the challenges of stratospheric ozone depletion. In this pursuit, there have been few successes and many failures. Such a mixed experience contains lessons in how to improve the effectiveness of linking knowledge to action. Generally lacking, however, has been the systematic scholarship needed to extract those lessons for general use. As a result, society lacks a critical understanding regarding which kinds of programs, institutional arrangements, and, more generally, "knowledge systems" can most effectively harness S&T for sustainability.

Earlier work on the determinants of effective scientific advice in the environmental arena has established three points of departure for the work reported here. The first is based on historical analyses of environmental issues that trace their emergence from initial scientific discoveries to high-level policy agendas. This work suggests that the "effectiveness" of scientific inputs needs to be gauged in terms of impacts on how issues are defined and framed, and on which options for dealing with issues are considered, rather than only in terms of what actions are taken to address environmental problems. The same work shows that perspectives of a decade or more may be necessary to reliably evaluate the impact of science, technology and ideas on issue evolution (4–6).

Our second point of departure is based on evaluations of scientific advice in general, and environmental assessments in particular. It suggests that scientific information is likely to be effective in influencing the evolution of social responses to public issues to the extent that the information is perceived by relevant stakeholders to be not only *credible*, but also *salient* and *legitimate*. In the sense used here, *credibility* involves the scientific adequacy of the technical evidence and arguments. *Salience* deals with the relevance of the assessment to the needs of decision makers. *Legitimacy* reflects the perception that the production of information and technology has been respectful of stakeholders' divergent values and beliefs, unbiased in its conduct, and fair in its treatment of opposing views and interests. Our work shows these attributes are tightly coupled, such that efforts to enhance any one normally incur a cost to the others (7–9).

Finally, a wide range of studies have identified the importance to effective science advising of "boundary work" carried out at the interface between communities of experts and communities of decision makers. This work highlights the prevalence of different norms and expectations in the two communities regarding such crucial concepts as what constitutes reliable evidence, convincing argument, procedural fairness, and appropriate characterization of uncertainty. It points out the difficulty in effective communication between the communities that results from these differences, and stresses the importance for effective advising of explicit development of boundary-spanning institutions or procedures (10–12).

The work reported here integrates, applies, and extends these insights to the study of systems for harnessing science, technology, and, more generally, programs linking knowledge to action for sustainable development. In particular, we explore the extent to which variance in the effectiveness of such systems can be explained by the ways in which their provisions for boundary work at the interface of science and policy balance the tradeoffs among the credibility, salience, and legitimacy of the information they produce. Section 2 describes our case studies. Section 3 reports our initial findings on the functions performed by relatively effective systems for harnessing S&T to sustainability. Section 4 reports tentative conclusions regarding how performance of those functions is facilitated by explicit efforts to organize and manage the "boundaries" separating the knowledge and action communities. We close in Section 5 by discussing these results and their implications for both research and practice.

Case Studies in Knowledge Systems for Sustainability

The broad research program, of which the study represented here is a part, has relied on a wide range of cases for analysis. For research on the vulnerability of coupled human–environment systems, Turner *et al.* (13) report on in-depth analyses of the Yucatan peninsula in Mexico, the Yaqui Valley in Mexico, and the Arctic region. Members of the research team have also mined more than 30 cases derived from consultations in a series of eight international workshops in 2001–2002 sponsored by the Initiative on Science and Technology for Sustainability, the Third World Academy of Sciences, and the International Council for Science. Although relying on this diversity of cases as supporting evidence, this paper draws most heavily on several additional in-depth case studies conducted primarily by the authors of research, observation, assessment, and decision support systems

Abbreviations: S&T, science and technology; R&D, research and development; CGIAR, Consultative Group on International Agricultural Research; ENSO, El Niño/Southern Oscillation; CIMMYT, Centro Internacional de Mejoramiento de Maíz y Trigo; PEAC, Pacific ENSO Applications Center.

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- This study suggests that efforts to mobilize S&T for sustainability are more likely to be effective when they **manage boundaries between knowledge and action** in ways that simultaneously enhance the **salience, credibility, and legitimacy** of the information they produce. Effective systems apply a variety of institutional mechanisms that facilitate communication, translation and mediation across boundaries.

Recherche ⟷ Filières

Connaissance { **Pertinente** / **Crédible** / **Légitime**

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Produire des connaissances actionnable (Clark et al. 2016)

COLLOQUIUM PERSPECTIVE

Crafting usable knowledge for sustainable development

William C. Clark[a,1], Lorrae van Kerkhoff[b], Louis Lebel[c], and Gilberto C. Gallopin[d]

Edited by B. L. Turner, Arizona State University, Tempe, AZ, and approved March 18, 2016 (received for review January 27, 2016)

This paper distills core lessons about how researchers (scientists, engineers, planners, etc.) interested in promoting sustainable development can increase the likelihood of producing usable knowledge. We draw the lessons from both practical experience in diverse contexts around the world and from scholarly advances in understanding the relationships between science and society. Many of these lessons will be familiar to those with experience in crafting knowledge to support action for sustainable development. However, few are included in the formal training of researchers. As a result, when scientists and engineers first venture out of the laboratory or library with the goal of linking their knowledge with action, the outcome has often been ineffectiveness and disillusionment. We therefore articulate here a core set of lessons that we believe should become part of the basic training for researchers interested in crafting usable knowledge for sustainable development. These lessons entail at least four things researchers should know, and four things they should do. The knowing lessons involve understanding the coproduction relationships through which knowledge making and decision making shape one another in social–environmental systems. We highlight the lessons that emerge from examining those coproduction relationships through the ICAP lens, viewing them from the perspectives of Innovation systems, Complex systems, Adaptive systems, and Political systems. The doing lessons involve improving the capacity of the research community to put its understanding of coproduction into practice. We highlight steps through which researchers can help build capacities for stakeholder collaboration, social learning, knowledge governance, and researcher training.

sustainable development | knowledge systems | capacity | coproduction | science–policy interface

This paper seeks to promote better mobilization of knowledge for the pursuit of sustainable development. Our starting point is the original vision of sustainability (we use "sustainability" and "sustainable development" interchangeably throughout this paper) set forth by the World Commission on Environment and Development in 1987 and recently reaffirmed and refined by the United Nations (UN) General Assembly's formal adoption of *The 2030 Agenda for Sustainable Development*. Here we follow recent scholarship (1, 2) in encompassing the multiple UN goals under a broader conceptualization that sees sustainable development as the promotion of inclusive human well-being; this is to say, well-being that is shared equitably within and across generations and is built on the enlightened and integrated stewardship of the planet's environmental, economic, and social assets.

Great improvements have taken place in many people's well-being over recent generations. However, contemporary development is not sustainable development. It leaves too many of today's people behind (3). Also, it achieves today's increasingly inequitable gains by degrading many of the essential assets on which the prospects for tomorrow's prosperity depend. Promoting a transition toward more sustainable development paths is an urgent task that will require unprecedented contributions from political leaders, business entrepreneurs, and civil society actors working together across scales. However, it will also require mobilizing more and better knowledge of ways to secure and sustain inclusive improvements in human well-being. Much of the needed knowledge already exists, but new discoveries, inventions, and practices are also needed.

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This paper results from the Arthur M. Sackler Colloquium of the National Academy of Sciences, "Linking Knowledge with Action for Sustainable Development" held April 3–4, 2008, at the National Academy of Sciences in Washington, DC. The complete program and audio files of most presentations are available on the NAS website at: www.nasonline.org/SACKLER_sustainable_development.

Author contributions: W.C.C., L.v.K., L.L., and G.C.G. designed research, performed research, and wrote the paper.

The authors declare no conflict of interest.

This article is a PNAS Direct Submission.

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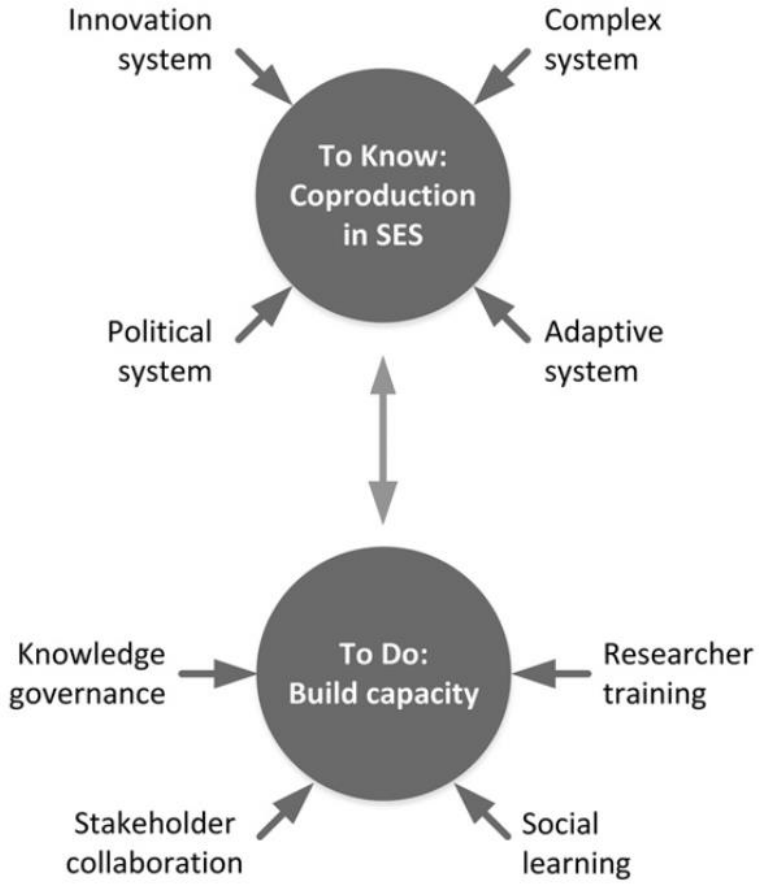

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Description du dispositif de recherche participative DomeTsip

COMMENT FAIRE EN PRATIQUE?

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Au niveau national

- 2009-2015: recherches préliminaires
- 2013, 2015, 2016: Tables rondes multi-acteurs
  - Chercheurs
  - Exportateurs
  - Ministères

Domestication

Qualité

Forces	Faiblesses
1 - Produit final est bien positionné sur son marché 2 –Critères marketing en vogue : bio, équitable, durable, cueillette sauvage. 4 – Début de concertation multi-acteurs 5 – Absence de normes spécifiques (CCCO) 6 – Marché confidentiel	1 – Plante, fruit transformation encore méconnus 2 – Mode de cueillette destructif 3 – Acteurs de la filière non professionnels 4 – Filière non structurée 5 – Absence de cadre réglementaire 6 – Variabilité des goûts (espèces, terroirs, tuteurs ?) 7 – Techniques de conservation non maîtrisées 8 – Filière, petite et récente peu visible des bailleurs et des pouvoirs publics 9 – Ventilation de la rente inéquitable
Opportunités	**Menaces**
1 – Existence d'autres usages potentiels comme les H.E. et les usages pharmaceutiques 2 – Domestication possible 3 – Endémique de Madagascar 4 – Usage traditionnel 5 – Facile à travailler 6 – Diversité de goûts constatée 7 – Aire de répartition géographique Nationale	1 – Déforestation 2 – Cueillette et collecte difficiles à contrôler et à tracer 3 –Changement climatique 4 – Effet de mode (?) 5 – Normes sanitaires européennes (New Food) 6 – Instabilité politique à Madagascar

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Le modèle FTT « Follow The Technology » (Douthwaithe 2001)

ECOLOGY AND SOCIETY

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ES HOME > VOL. 5, NO. 2 > ART. 13

The following is the established format for referencing this article:
Douthwaite, B., N. C. de Haan, V. Manyong, and D. Keatinge. 2001. Blending "hard" and "soft" science: the "follow-the-technology" approach to catalyzing and evaluating technology change. Conservation Ecology 5(2): 13. [online] URL: http://www.consecol.org/vol5/iss2/art13/

A version of this article in which text, figures, tables, and appendices are separate files may be found by following this link.

Synthesis, part of Special Feature on Integrated Natural Resource Management

Blending "Hard" and "Soft" Science: the "Follow-the-Technology" Approach to Catalyzing and Evaluating Technology Change

Roru Douthwaite, Nicoline C. de Haan, Victor Manyong, and Dyno Keatinge

International Institute of Tropical Agriculture

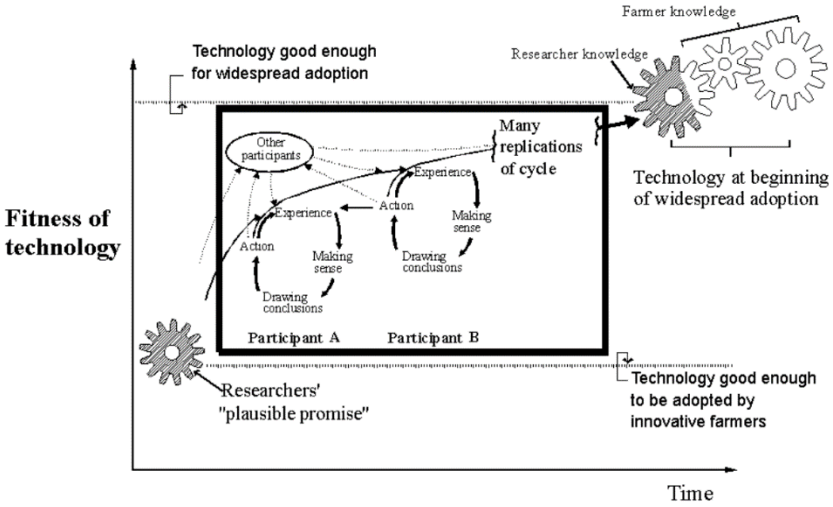
ABSTRACT

The types of technology change catalyzed by research interventions in integrated natural resource management (INRM) are likely to require much more social negotiation and adaptation than are changes related to plant breeding, the dominant discipline within the system of the Consultative Group on International Agricultural Research (CGIAR). Conceptual models for developing and delivering high-yielding varieties have proven inadequate for delivering natural resource management (NRM) technologies that are adopted in farmers' fields. Successful INRM requires tools and approaches that can blend the technical with the social, so that people from different disciplines and social backgrounds can effectively work and communicate with each other. This paper develops the "follow-the-technology" (FTT) approach to catalyzing, managing, and evaluating rural technology change as a framework that both "hard" and "soft" scientists can work with. To deal with complexity, INRM needs ways of working that are adaptive and flexible. The FTT approach uses technology as the entry point into a complex situation to determine what is important. In this way, it narrows the research arena to achievable boundaries. The methodology can also be used to catalyze technology change, both within and outside agriculture. The FTT approach can make it possible to channel the innovative potential of local people that is necessary in INRM to "scale up" from the pilot site to the landscape. The FTT approach is built on an analogy between technology change and Darwinian evolution, specifically between "learning selection" and natural selection. In learning selection, stakeholders experiment with a new technology and carry out the evolutionary roles of novelty generation, selection, and promulgation. The motivation to participate is a "plausible promise" made by the R&D team to solve a real farming problem. Case studies are presented from a spectrum of technologies to show that repeated learning selection cycles can result in an improvement in the performance of the plausible promise through adaptation and a sense of ownership by the stakeholders.

KEY WORDS: actor-oriented approach, follow-the-technology approach, integrated natural resource management, learning selection approach, participatory technology development, social construction of technology.

Published: December 20, 2001

INTRODUCTION



1 - Une promesse plausible déjà crédible mais incomplète

2 - Des expérimentations participatives pour améliorer cette promesse

3 - Suivi, validation et diffusion

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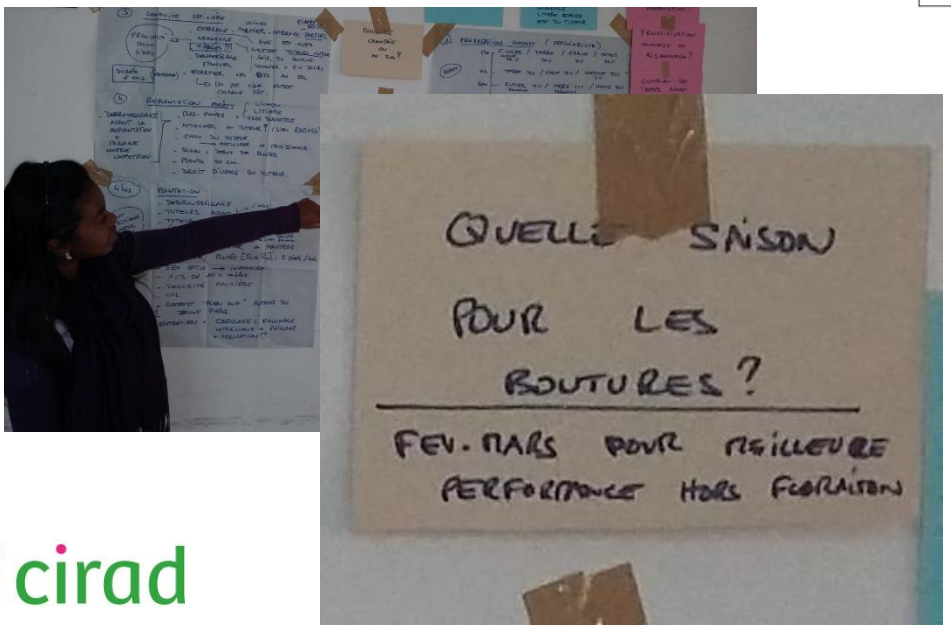
Définition de la « promesse plausible » 5-6 Juin 2017

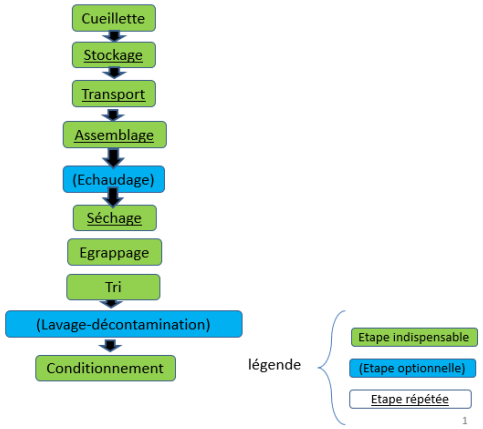
- 8 chercheurs, 5 « professionnels », 5 animateurs
- Méthode HACCP

Fiche technique

1. Elaborée le : 30/10/2017		**Revisée le : /**
2. Identification	Fiche n° : 3	Tenue de la pépinière
3. Produit obtenu :		Boutures enracinées vivantes
4. Equipements requis : • Pépinière, arrosoir, pulvérisateur dorsal		
5. Compétences requises : Pratique de la pépinière, assiduité		
6. Durée de l'opération :		3 mois
7. Description détaillée du processus :		
‣ Arrosage des jeunes plants 2 fois/j (matin et soir) ‣ Arrosage des plants plus grands trois fois par semaine, selon le degré d'humidité de la zone en évitant les excès d'eau ‣ Sarclage des pots régulier ‣ Après 3 à 4 semaines, les pots sont espacés: Largeur d'un pot entre chaque rangée et colonne de pot		
8. Dangers rencontrés et causes d'apparition Dessèchement Parasites Compétition pour la lumière Vol Mélange mâles/femelles Dégâts dus à la volaille		**9. Mesures préventives préconisées** Réglage de l'ombrage et surveillance quotidienne Sarclage régulier Espacement des pieds Surveillance régulière et replantation dès le début des pluies Séparation physique des pieds mâles et femelles Enclos fermé + surveillance quotidienne
10. Indicateurs de performances de la pépinière : Taux de survie > 70%		



Description du du procédé de transformation



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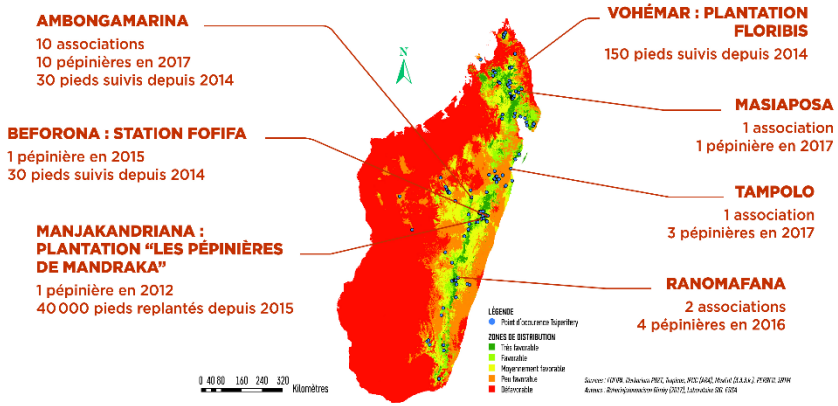
Au niveau local: sites pilotes



- Au sein de chaque site
  - Organisation de producteurs
  - Pépinière collective
  - Séchoir collectif
  - Parcelle de démonstration
  - Replantations individuelles
  - 1 Acheteur
- Recherche
  - 30 pieds « sauvages » suivis
  - Suivi des pépinières
  - Journal de bord

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Formations Juillet – Décembre 2017

- 3 formations « types »
  - Cueillette/identification (3/4)
  - Bouturage/replantation (4/4)
  - Séchage/commercialisation (2018)

- Dynamique collective
  - Un partenaire local
  - Un technicien
  - Une « association »
  - « Expérimentons ensemble »

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Suivi et validation

- Dispositif de suivi
  - 2 chargées de mission
    - Plantes
    - Paysans
    - 2 visites par site par an
  - 1 technicien par site
- Dispositif expérimental
  - Plantation en station
  - Laboratoire analyses sensorielles
  - Partenariat interdisciplinaire (dP F&B)

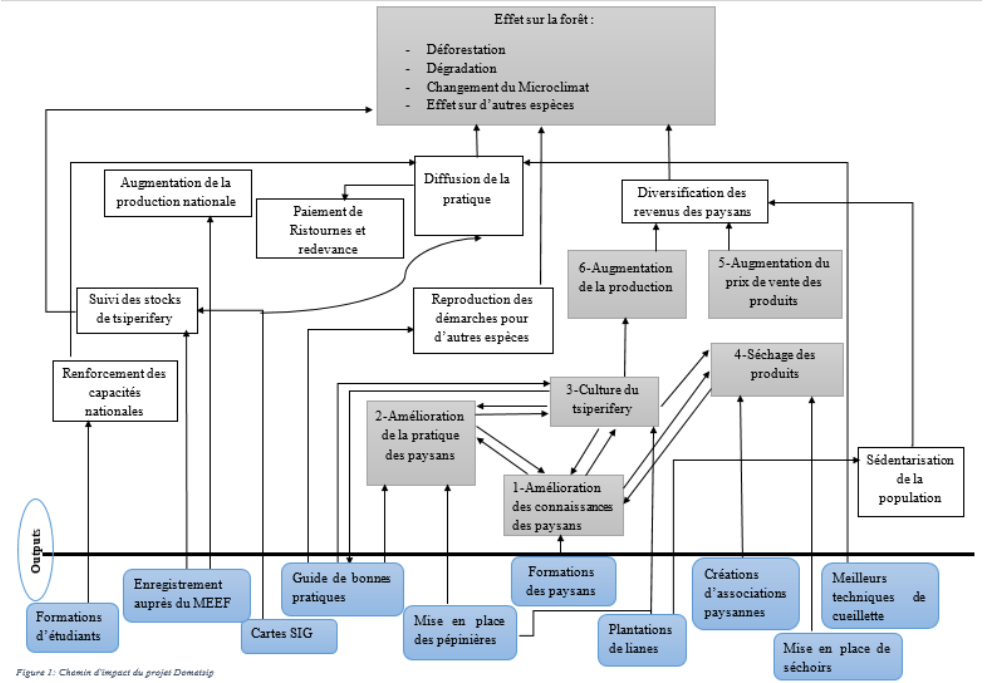

Figure 1: Chemin d'impact du projet Dometsig

Evaluation ex-ante des effets (Chemin de l'impact)
« Program Theory Evaluation »

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Illustrations

- Tampolo (*piper nigrum et Girofle*)
  - 3 lianes par tuteur
  - Semis direct sans pépinière
- Masiaposa (*vanille*)
  - Culture sur treille
  - Goûter les lianes pour déterminer le sexe (femelles plus piquantes)
- Ambongamarina (*charbon/riz/manioc*)
  - Plantation en forêt domaniale => accaparement foncier potentiel

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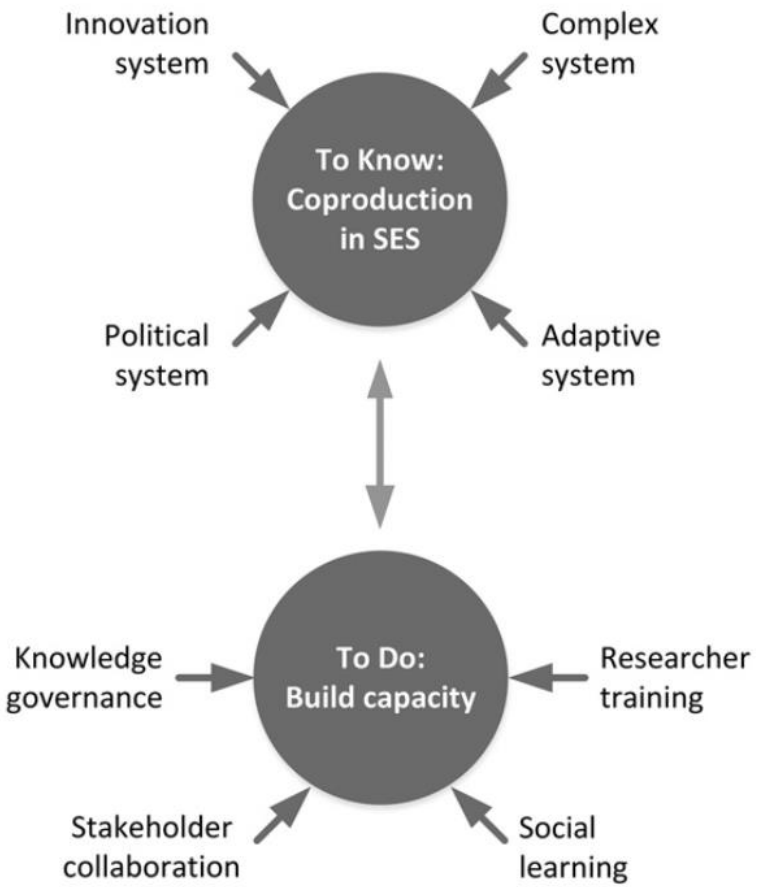
Conclusion intermédiaire



- **Knowledge governance**
  - Diffusion en temps réel des bonnes pratiques à tous les sites
- **Stakeholder collaboration**
  - Co-construction de l'agenda de recherche au niveaux local et national
- **Social learning**
  - Objets collectifs (pépinière, séchoirs, marque collective)
- **Researcher training**
  - 2 thèses, 7 stages, cette présentation

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Perspectives

- 2018
  - Guide de bonnes pratiques V2.0
  - Enregistrement CITES/MEEF
  - Financer la suite du projet
- Octobre 2018: Assises de la filière *Tsiperifery*

  => Nouvelles questions de recherche
- Extension du réseau: Ambanja, Toalagnaro, Ambositra

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Merci de votre attention

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