

# Functional dynamics to strengthen an agroecological technological innovation : the case of seedlings from stem fragments (PIF) plantain propagation technology in Cameroon

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# PIF technique : a technological agroecological innovation

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[https://www.youtube.com/watch?v=p\\_zNU2e2UHk&ab\\_channel=CORAF](https://www.youtube.com/watch?v=p_zNU2e2UHk&ab_channel=CORAF)



# Presentation plan

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1. Introduction
2. Materials and methods
3. Results
4. Discussion and conclusion

# 1. Introduction

## 1.1. Context

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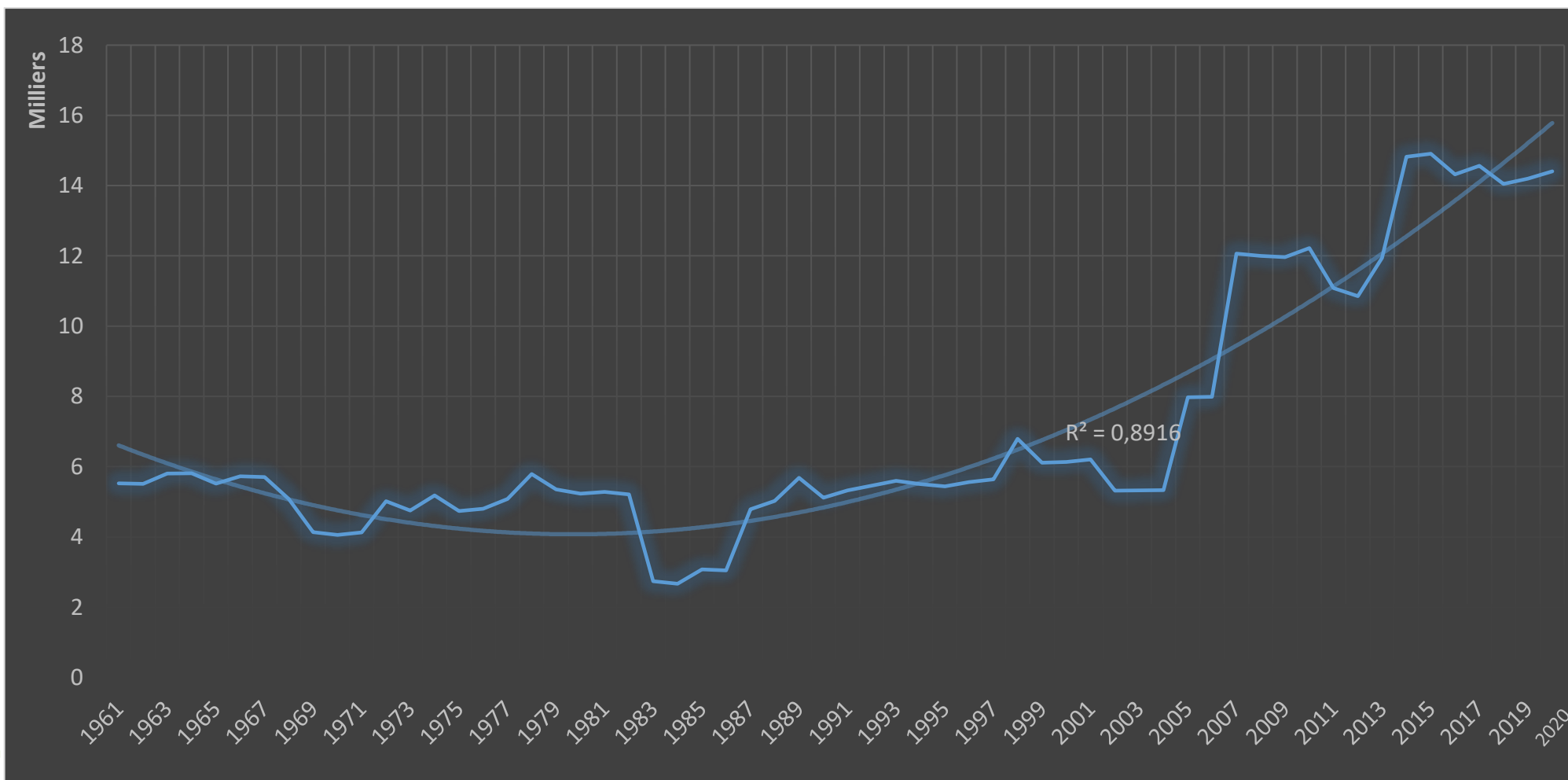
- Cameroon is the 4<sup>th</sup> largest plantain producer in Central and West Africa
- Banana plantain is a priority food source



# 1. Introduction

## 1.1. Context

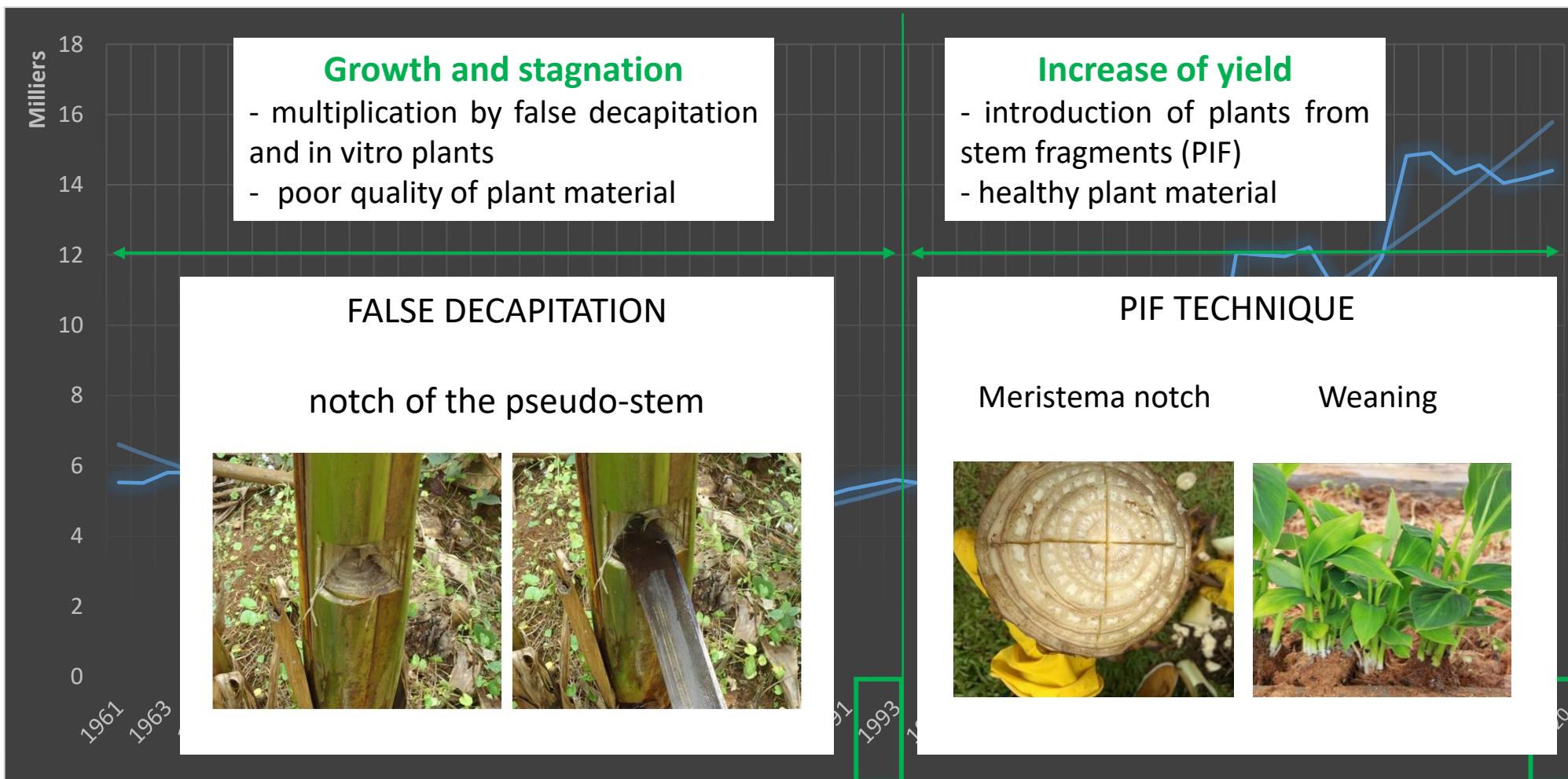
Fig 1 : Evolution of plantain's production yield in Cameroon from 1961 to 2020



# 1. Introduction

## 1.1. Context

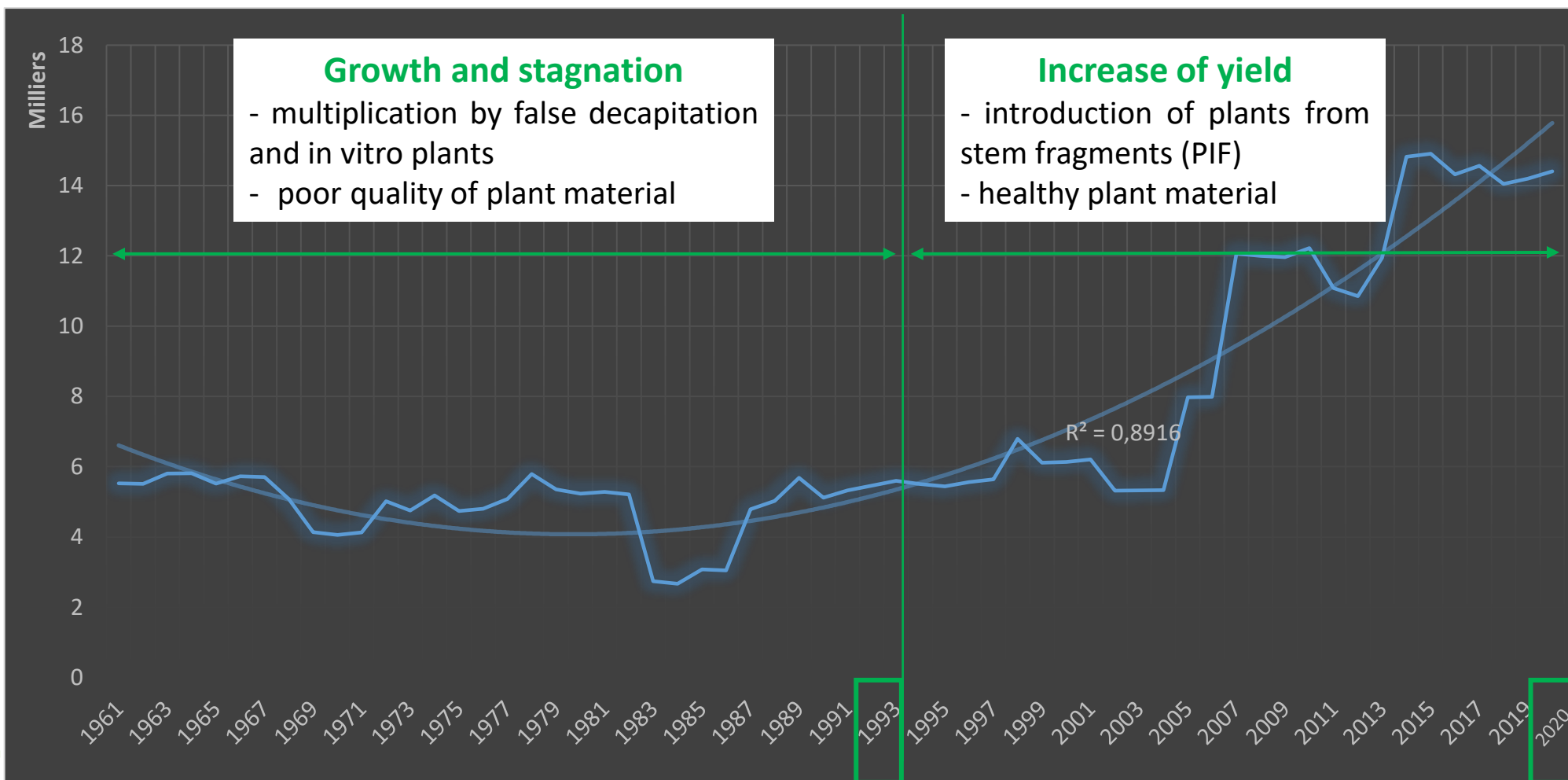
Fig 1 : Evolution of plantain's production yield in Cameroon from 1961 to 2020



# 1. Introduction

## 1.1. Context

Fig 1 : Evolution of plantain's production yield in Cameroon from 1961 to 2020





# 1. Introduction

## 1.2. Problem

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- How could the PIF technique sustain itself over the long term ?
  - ✓ ... Securisation of plant material's sanitary quality ?
  - ✓ ... Autonomisation of the nurserymen profession ?
  - ✓ ... Access to the seedlings for plantain producers ?



# 1. Introduction

## 1.3. Conceptual framework

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- **Innovation are processes that** occurs within ...
- **....Agricultural Innovation System** (Hall et al., 2003, Spielman et al., 2008) and actors do activities which are...
- **Innovation Support Services** (Faure et al., 2019, Mathé et al., 2016) and activate ...
- **... Functions** (Bergek, 2008, Hekkert, 2007, Suurs, 2009)

# 1. Introduction

## 1.4. Research question

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**What are the functional mechanisms at the basis of the PIF technique trajectory ?**

## 2. Materials and methods

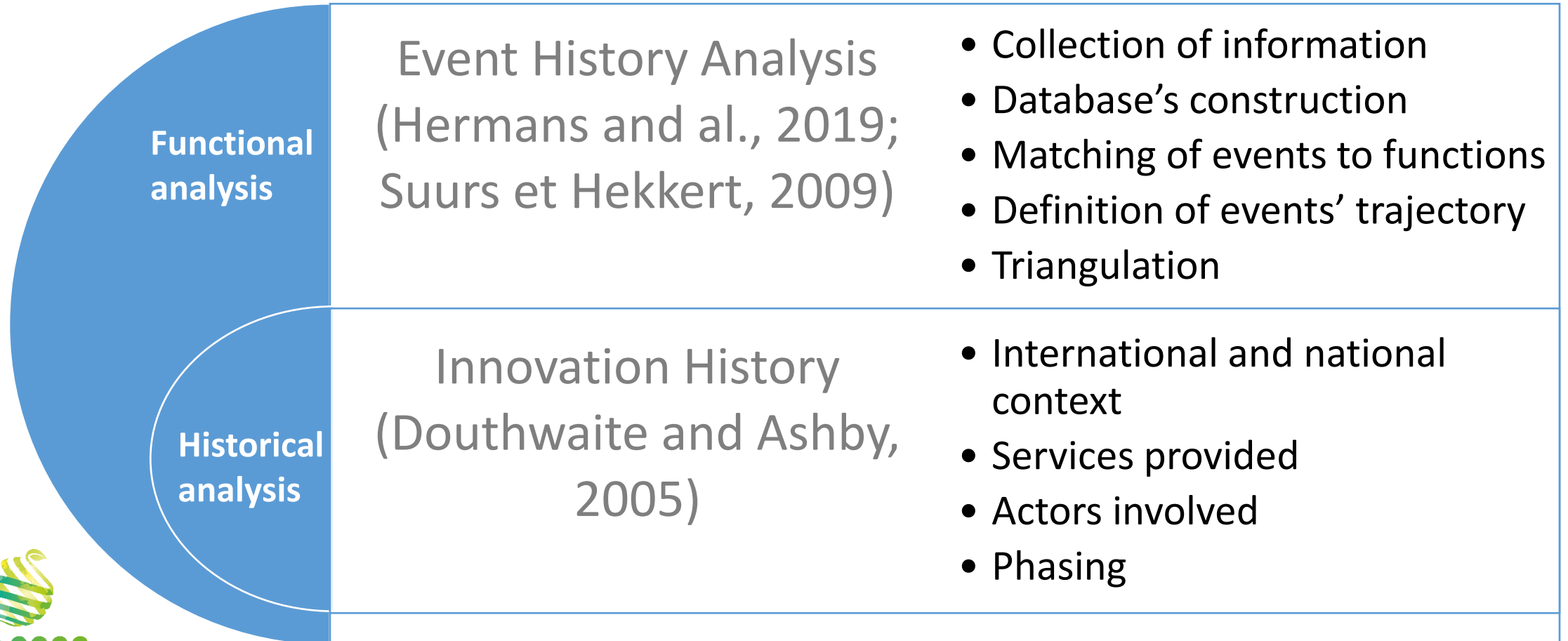
### 2.1. Data collection

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- Snowball sampling
- Key actors involved in the process : international and national research institute, government and state agencies, private companies, nurserymen
- 45 respondents
- 30 service providers and 15 beneficiaries of services

## 2. Materials and methods

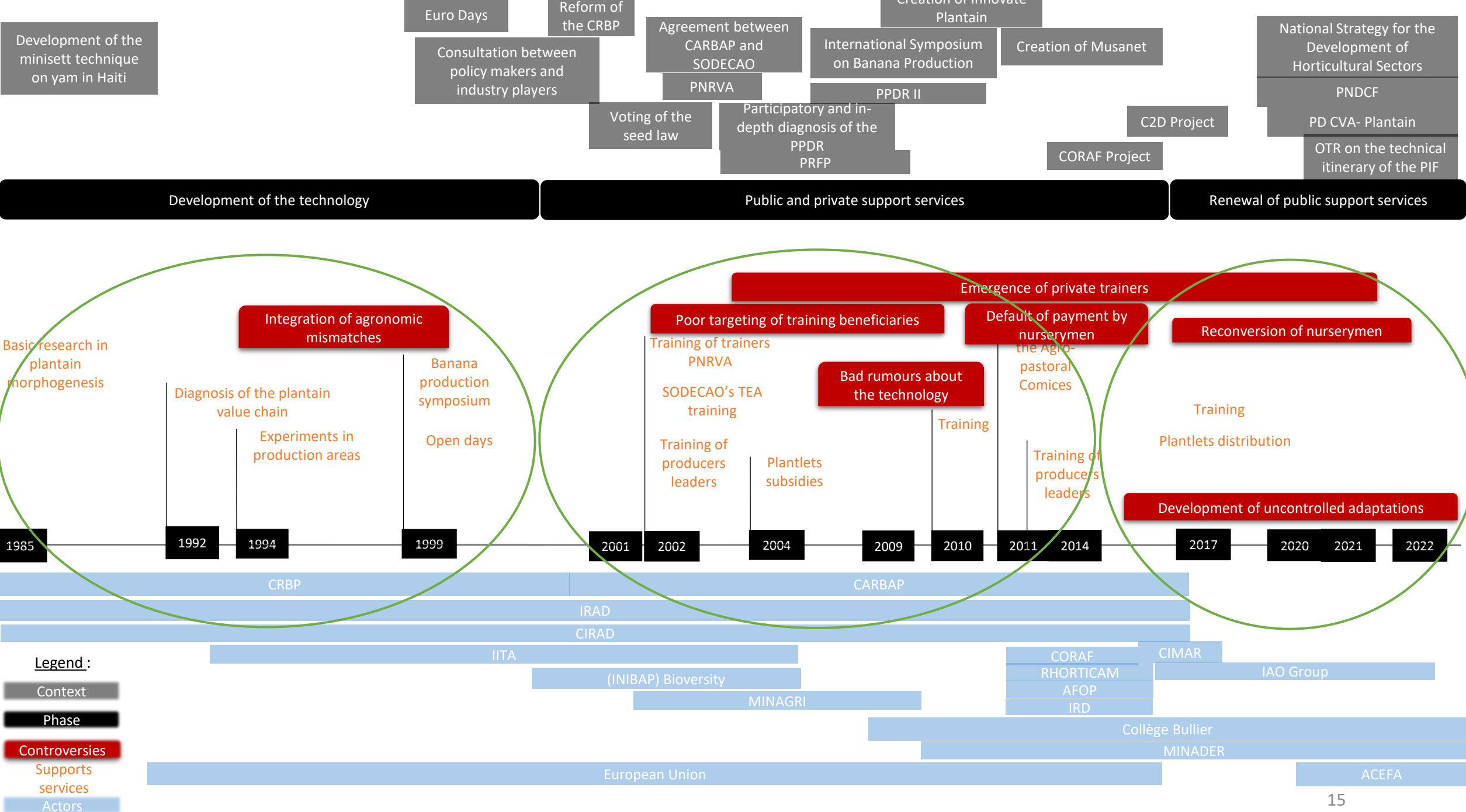
### 2.2. Data analysis



## 3. Results

### 3.1. PIF technique trajectory

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# 3.Results

## 3.2. PIF technique process functional dynamics

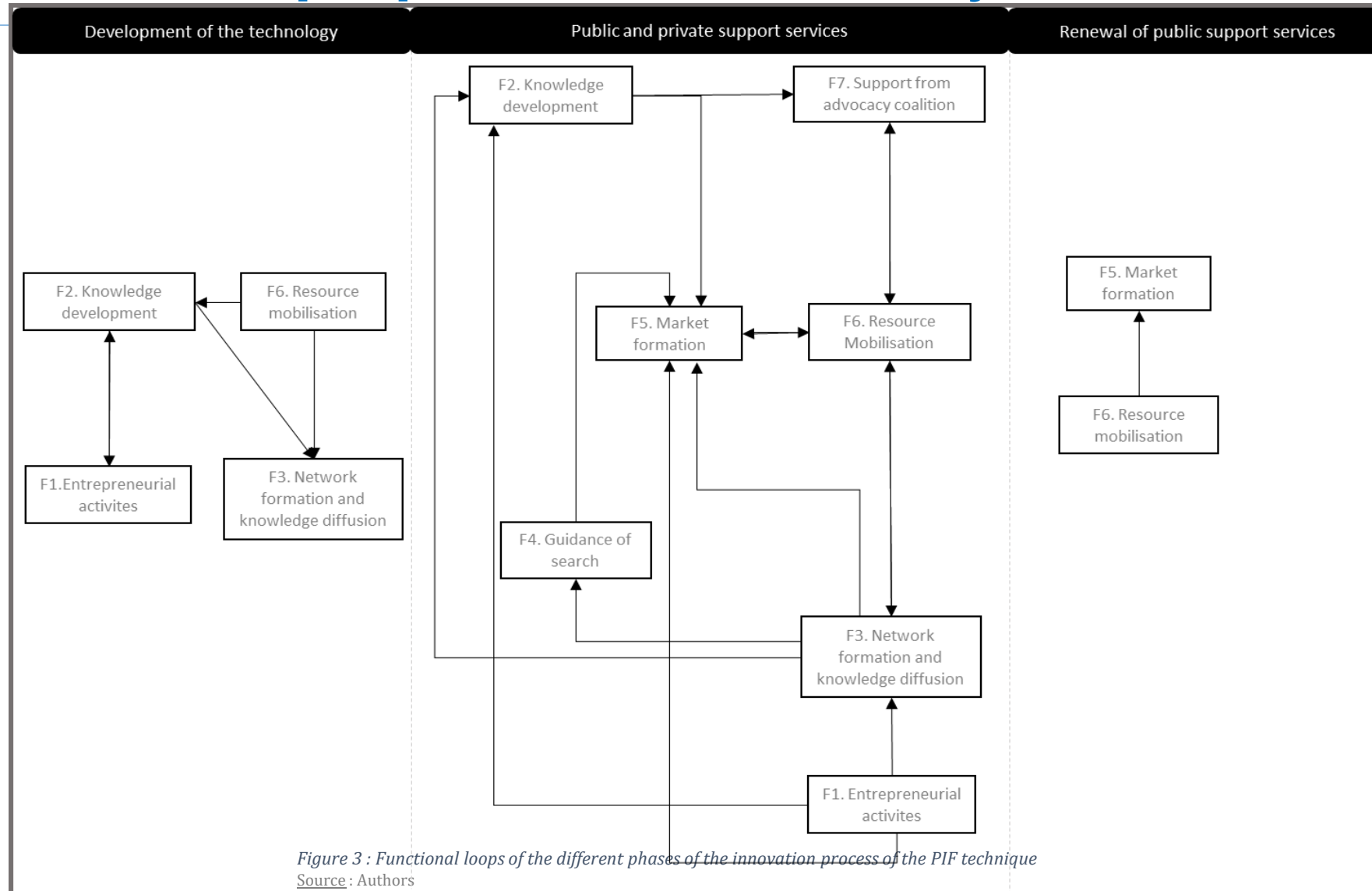


Figure 3 : Functional loops of the different phases of the innovation process of the PIF technique  
Source : Authors



## 4. Discussion

### 4.1. Functional failures (1/2)

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- From phase 1 : Science and Technology Push Motor (Suurs, 2009) lacks guidance of search
  - Weak role of the Research Institute (CARBAP) in the process
- From phase 2 : Market Motor (Suurs, 2009) lacks mobilisation of resources to improve R&D or capitalisation and came without System Building Motor
  - Hindrances in the entrepreneurial autonomy of nurserymen profession from public program
  - Blockage of the setting of a certification for sanitary control

## 4. Discussion

### 4.1. Functional failures (2/2)

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- In order to resynchronize the functions of the process :
  - Capitalisation of « experiential » or « informal » knowledge (Alaie, 2020; Berkes et al., 2000; Suurs, 2009).

## 4. Discussion

### 4.2. Gouvernance failures (1/2)

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- From phase 2 : ad hoc collaborations for dissemination and divergence of objectives
  - Hindrances of dissemination towards right targets
  - Limitations to the complementarity of the interventions
  - Incompleteness of the dissemination

## 4. Discussion

### 4.2. Gouvernance failures (1/2)

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- In order to take advantage from collaborative approach :
  - Public-Private Partnerships between research institute, government and private companies
  - Coordination of vision sharing on R&D and dissemination
  - Formal and informal knowledge capitalisation through information systems

## 4. Discussion

### 4.3. Policy implications

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- In the context of developing countries, need of support services to empower the « research actor » in piloting of technological agricultural innovation by activating functions of :
  - Strengthening of the sanitary control
  - Purposeful collaborations to anchor the nurserymen profession
- Orient PIF technique use and plantain production system towards agroecology around the world.

## 4. Discussion

### 4.4. Conclusion

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- Historical and functional analysis lead to highlighting :
  - Trajectory of an agroecological innovation process and mechanism : functional desynchronization and sources of failures
  - Sounds recommendations for policy making : action-oriented and actor-oriented

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**Thank you**  
**Any questions ?**

