



FOFIFA

NATIONAL CENTRE FOR APPLIED RESEARCH
FOR RURAL DEVELOPMENT

**Impact of climate change on the achievement of the objectives
rice production in Madagascar and
Solutions adopted to mitigate the risk**

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**FOFIFA/CENRADERU IS UNDER THE DUAL SUPERVISION
OF THE MINISTRY OF AGRICULTURE AND LIVESTOCK AND
OF THE MINISTRY OF HIGHER EDUCATION AND
SCIENTIFIC RESEARCH**

Double mission:



In terms of research:

Implement the general research policy for rural development (definition, promotion, guidance, coordination, capitalization of all research activities)

Develop basic thematic research to anticipate problems



In terms of development:

Implement the framework documents of the general policy and the strategies of the Ministry of Agriculture and Livestock



In short, to generate technologies and innovations to increase the agricultural production with a view to achieving food self-sufficiency and increasing the incomes of producers in Madagascar





- Climate change has significant effects on rice production in Madagascar.
- Global warming could have serious consequences for rice production.
- Rice production is vulnerable to drought, cyclones and therefore to the various climatic events in the face of climate change
- Rice cultivation is among the most vulnerable crop types to the effects of climate change.



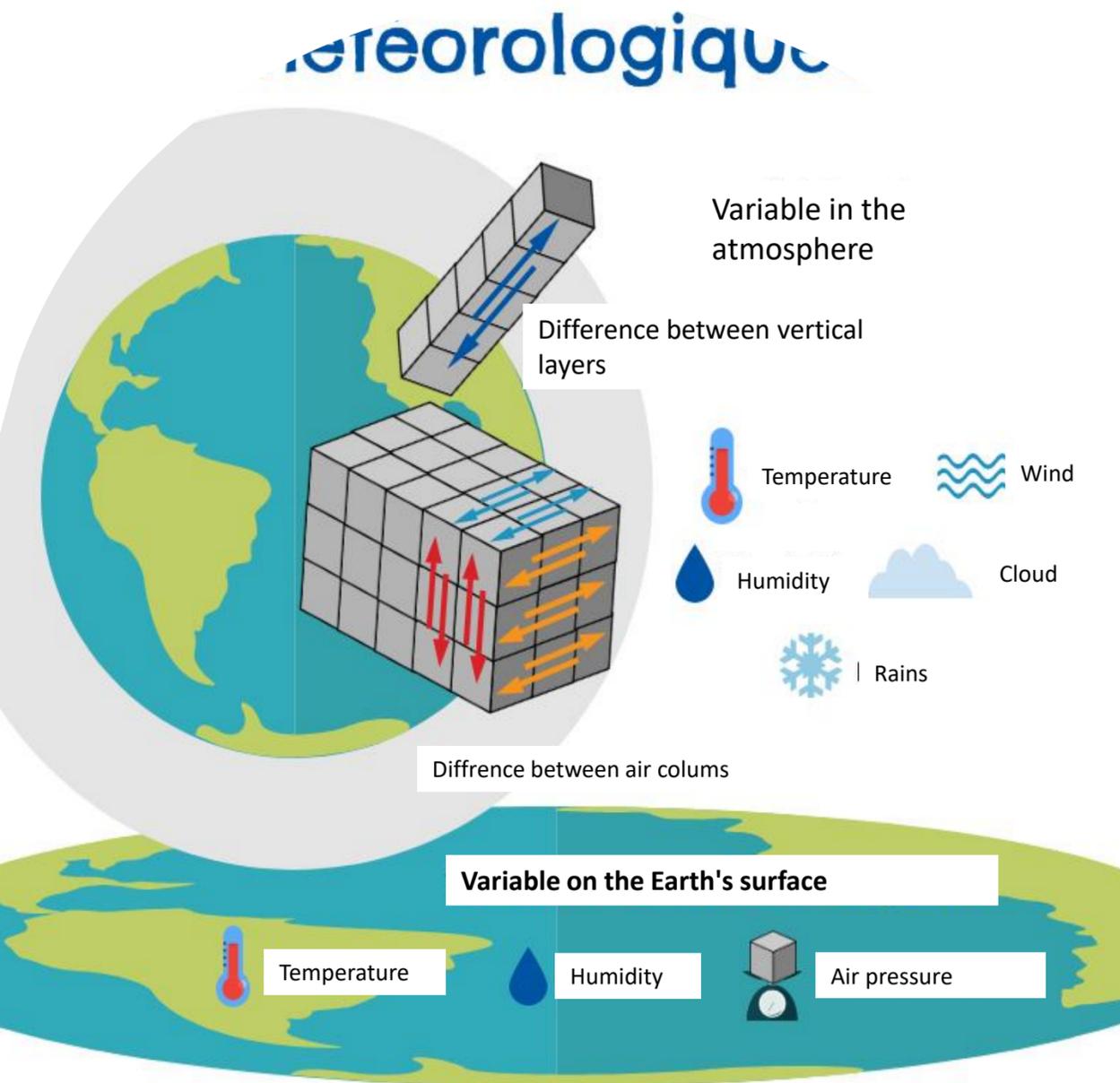
RICE FARMERS' STRATEGIES

Rice farmers are adopting different strategies to adapt to climate change, such as:

- ✓ The use of improved seeds and short-cycle varieties (P hoto: V A R I E T Y M E N U (R I C E)
- ✓ the addition of fertilizers to improve soil fertility.
- ✓ These strategies aim to improve agricultural productivity face to drought and/or flooding as well as the proliferation of pests and the appearance of new pests (photo : insects and rice plants attack ed by pests)



CLIMATIC PARAMETERS INFLUENCING RICE PRODUCTION



GRADUAL RISE IN TEMPERATURES

- THE INTENSIFICATION OF DROUGHT
- EARLY RAINING SEASON

LATE RAINS

- DISRUPTION OF THE RAINY SEASONS (LATE START OR EARLY CESSATION OF RAINS)

DELAYED OR SHORTENED IN SOME PARTS OF MADAGASCAR

SHORTENED RAINFALL PERIOD / OR FLOODING

POOR DISTRIBUTION OF RAINFALL

- ✓ INTENSIFIED RAINS OR ACCOMPANIED BY STRONG WINDS OR CYCLONES RESULTING IN FLOODING



THE CONSEQUENCES



DISRUPTION OF THE RICE GROWING SEASON IN MADAGASCAR



ENVIRONMENTAL DEGRADATION AS WELL AS FARMERS' RICE PRODUCTION YIELD



-VICTIMS OF NATURAL DISASTERS, AGRICULTURAL LAND BECOMES UNUSABLE, HENCE THE EXPLOITATION OF FORESTS AND ALSO THE DESTRUCTION OF INFRASTRUCTURE AND THE INTERRUPTION OF RICE SUPPLY CHAINS



ENVIRONMENTAL EROSION AND LAND DEGRADATION THROUGH ABUSIVE LOGGING.



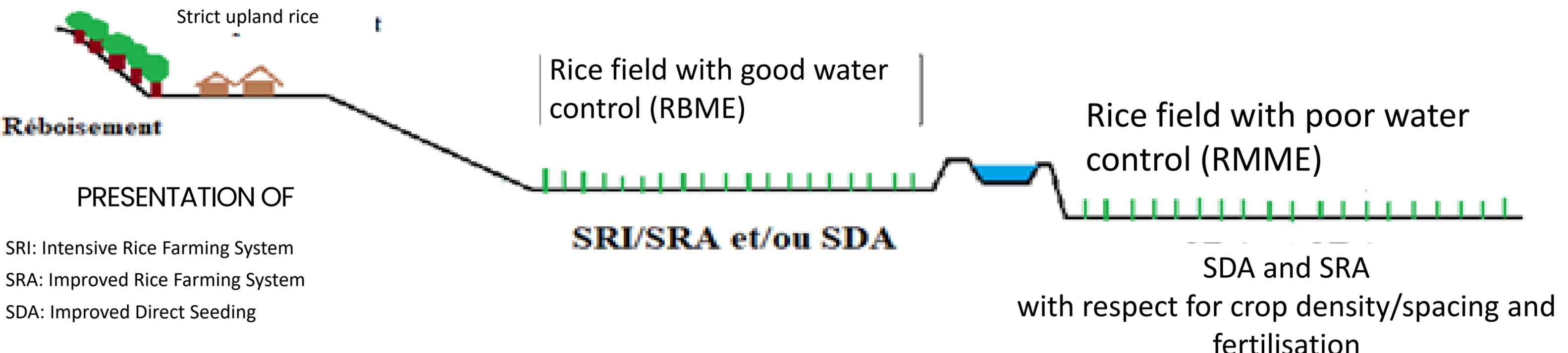
-PROLIFERATION OF CROP PESTS, INSECTS, PESTS AND PESTS CAUSING VARIOUS PLANT DISEASES AND CAUSING LOSSES AND DAMAGE TO RICE CROPS



DROP IN YIELD

THE PROPOSED SOLUTIONS





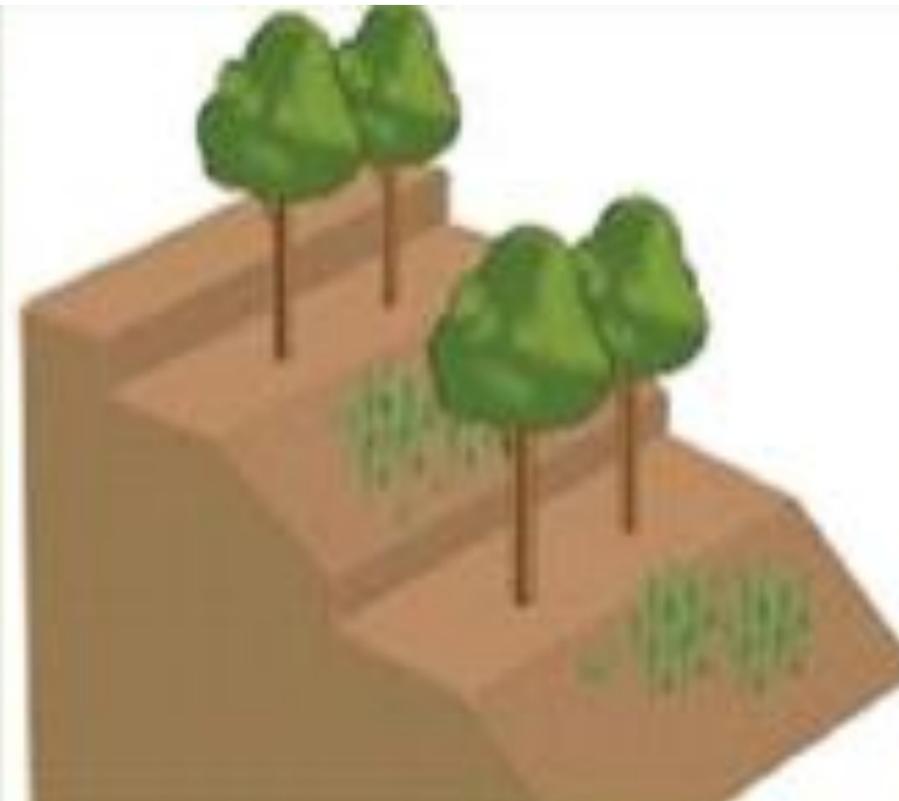
SRI: Intensive Rice Farming System
 SRA: Improved Rice Farming System
 SDA: Improved Direct Seeding

1. Strengthening resilience climate of rice cultivation through investments

Strengthening the climate resilience of rice cultivation through investments

The strategies developed to deal with climate change take into account not only the techniques to be applied at the rice level, but also consider all those relating to the management of the watershed overlooking the rice-growing plains.

- ✓ **Integrated watershed management** over the rice-growing plains
 Reforestation of the summit part of the hills overlooking the rice-growing plain.
- ✓ **Development of the sloping parts of the watershed** (terraced, contour lines, agroforestry or no-till cropping systems).
- ✓ **Development of rice fields in the rice-growing plain**
 In the rice-growing plain, the recommended technical itineraries vary according to the water conditions of rice cultivation in each region.
 - SRI/SRA Techniques for RBMEs.
 - ADS Technique for RMME
 - DMC Technique for Tanety Rice Farming



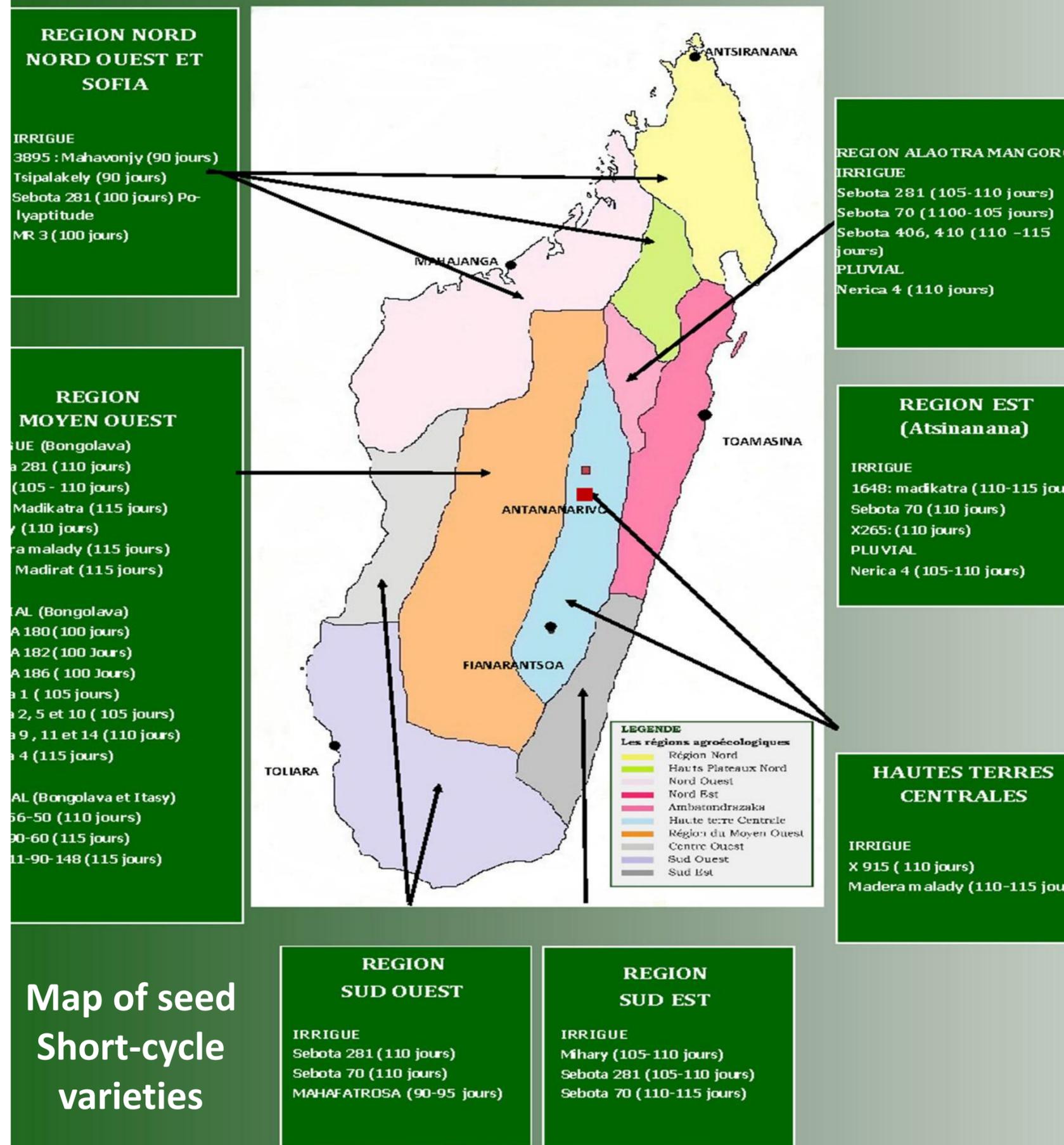
- Consulting weather data
- Practice of the no-till technique in case of irregular rainfall
- DMC Practice for Soil Moisture Conservation
- Reforestation
- Terrace layout
- Construction and use of water retention basins

2. WATER MANAGEMENT

3. Seed varieties Choices

Revised varietal map to mitigate the impact of climate change: **short-cycle varieties**

4. Nursery management - on bed and transplanting date



General varietal map



REGION NORD

Soamalandy Fotsiambo

IRRIGUE
 2787 : Soamalandy
 3914 : Mailaka (X265)
 4354 : FOFIFA 160

PLUVIAL
 3290 : IRAT 112
 3737 : Telorirana

REGION NORD OUEST ET SOFIA

Tsiresindrano Mahavonjy

IRRIGUE
 3190 : Miafimboa (IR 38)
 4127 : Mahadigny (X360)
 X398 : Tsiresindrano
 3885 : Mahavonjy
 X372 : Kellmirefaka (4356)
 1229 : Maolinika
 TOX : 3233 (ASARA)
 4349 : Vary manitra 1
 4342 : Vary manitra 2
 7254 : Fy Vary 32
 7255 : Fy vary 85

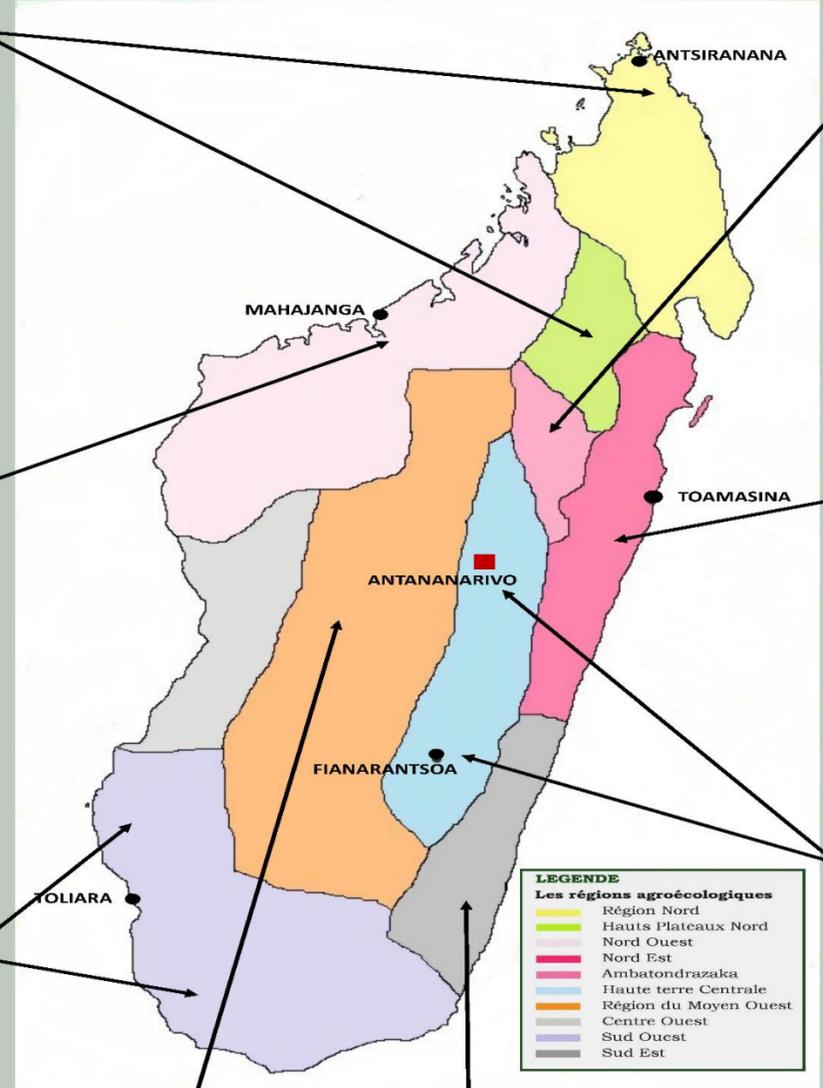
PLUVIAL (Baiboho)
 3895 : Mahavonjy/NDR 80
 3872 : Fotsiambo (B22)
 7279 : Mavitrika

REGION SUD OUEST

Morondava, Morombe, Tuléar

Soamalandy Mailaka

IRRIGUE
 2798 : Marotea
 2787 : Soamalandy
 3184 : Kellimamoa
 3914 : Mailaka
 3985 : Ajà Mizesta
 4156 : Mahafatrosa
 6937 : Soafintsanga
 7186 : FOFIFA 175
 7196 : Vesainky
 7246 : FOFIFA 187
 7247 : FOFIFA 188
 7248 : FOFIFA 189
 7249 : FOFIFA 190



AMBATONDRAZAKA

Mailaka Nerica 4

IRRIGUE
 3914 : Mailaka (X265)
 4012 : Tsemaka
 4145 : Madikatra
 7185 : FOFIFA 174
 7254 : Fy Vary 32,
 7255 : Fy vary 85

PLUVIAL
 3872 : Fotsiambo
 3290 : IRAT 112
 Nerica 3 et 4

REGION NORD EST

Mailaka Nerica 4

IRRIGUE
 3914 : Mailaka (X265)
 4354 : FOFIFA 160

PLUVIAL
 4355 : FOFIFA 161
 Nerica 4

HAUTES TERRES CENTRALES

F184 FOFIFA 173

Haute altitude : 1500m <Alt< 1850m

IRRIGUE
 4354 : FOFIFA 160
 7218 : FOFIFA 183 (Bas fond)
 7219 : FOFIFA 184 (Bas fond)
 7256 : FOFIFA 194 (M'Rile)
 7257 : FOFIFA 195 (Rosie)
 7258 : FOFIFA 196 (Vaniata)
 7254 : Fy Vary 32
 7255 : Fy vary 85

PLUVIAL
 4355 : FOFIFA 161
 4370 : FOFIFA 172 (CR)
 4368 : Chomrong (CR) « Tsipolitra »
 7214 : FOFIFA 180
 7215 : FOFIFA 181
 7221 : FOFIFA 186
 7279 : Mavitrika

Haute altitude : 800m <Alt< 1500m

IRRIGUE
 3912 = X243 = Kellimamokatra
 3914 : Mailaka (X265)
 4181 : Soameva ,
 4182 : Manjamena
 4145 : Madikatra
 X915

PLUVIAL
 4178 : FOFIFA 159
 4362 : FOFIFA 167
 4363 : FOFIFA 168
 4364 : FOFIFA 169
 4367 : FOFIFA 170
 4369 : FOFIFA 171 (CR)
 7184 : FOFIFA 173 (CR)
 7210 : FOFIFA 176
 7211 : FOFIFA 177
 7212 : FOFIFA 178
 7213 : FOFIFA 179
 7216 : FOFIFA 182
 7220 : FOFIFA 185

REGION MOYEN OUEST

Tsiroanomandidy, Mandoto

FOFIFA 160 Telorirana

IRRIGUE
 3914 : Mailaka
 4181 : Soameva
 4354 : FOFIFA 160

PLUVIAL
 3728 : Maharavo
 3729 : Marofia
 3730 : Mavolamba
 3872 : Fotsiambo
 3290 : IRAT 112
 4131 : FOFIFA 154
 4178 : FOFIFA 159
 4355 : FOFIFA 161
 Nerica 3 et 4
 4368 : Chomrong (CR)
 4370 : FOFIFA 172 (CR)
 7184 : FOFIFA 173 (CR)
 Nerica 9 , 11 et 13
 7279 : Mavitrika

REGION SUD EST

F160 NERICA 4

IRRIGUE
 2787 : Soamalandy
 3914 : Mailaka (X265)
 4354 : FOFIFA 160
 Miary : Var sel vict

PLUVIAL
 3290 : IRAT 112
 3737 : Telorirana
 3872 : Fotsiambo
 Nerica 3 et 4



General varietal map

Different objectives included in the map



- Selecting short-cycle varieties
- Building drought or flood tolerance
- Selecting for Resilience to Climate Change: Madikatra
- Improving yield potential and production stability: Nerica series



- To discover resistance to diseases such as yellow variegation of rice or "mavobe" in the traditional variety Bekarosa2ka and Tox 3233, resistance to blast in Chomrongdan,



- Development of the striga-resistant variety in B22 by irradiation with the university and IAEA
- Developing resistance to salinity FOFIFA 187,



- Cold hardiness at FOFIFA 188, 189, 190, with Africa Rice
- Developing FOFIFA 175, 169, 173, 180, 186 cold resistance with DP SPAD
- Developing rainfed zinc-biofortified varieties to improve nutrition in the Mavitra/JIRCAS variety
- To approve and register in the CNEV adapted local varieties discovered by producers:
 - - such as Mangafotra in Ihorombe with DEFIS,
 - - the fragrant rice Madame Rose and the glutinous rice Mougoudjou in Diana with AFAFI Nord.



- Increasing added value by enhancing natural flavouring: FOFIFA Varimanitra Basamti type

5. Fertilization Management

- ✓ Burying of crop residues
- ✓ Adding bottom manure -Compost or other organic fertilizer as park manure
- ✓ Cover manure: urea + compliance with the recommended application period and dose
- ✓ Addition of maintenance fertiliser (NPK) + compliance with the recommended application period and dose
- ✓ Practice of RICE-VEGETABLE rotation on RMME



6. Crop Management and Maintenance



- Grass removal and integrated pest management (phytosanitary treatment)
 - Early weeding (15 days after transplanting or after sowing) to reduce nutrient competition
 - Then two more weeding spaced 15 days apart during the vegetative stage

7. Harvest and post-harvest management



- Target the maturity period before cutting
- Dry well before storing
- Store well in favorable conditions



8. Supporting rice farmers in the practice of innovative techniques to address climate change

- Participation of rice farmers in agricultural training, with extension agents,
- Education and Access to Credit are key factors that determine rice farmers' decisions to adapt to climate change



**THANK YOU FOR YOUR KIND
ATTENTION!**



**NOUS
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