GOOD AGRICULTURAL PRACTICES
OF QUALITY RAINFED LOWLAND RICE

Extension and advisory support
Overview

This picture block is made to facilitate the training sessions of rice producers on Good Agricultural Practices of rainfed season lowland rice.

Its structure as pictures on the front and text on the back helps the facilitator to convey the key messages for the improvement of current practices.

The facilitator should internalize the contents of the picture block so as to unwind a participatory and chronologically the different scenes from preparation of the land, establishing the nursery, transplanting, field maintenance, to harvesting and paddy storage.

Questions and answers on the back of the picture block serves as a guide to the facilitator and will in any case be subject to a continuous reading during the training session.

The implementation of Good Agricultural practices for rainfed season rice ensures good quality rice output and a lot of money to the producer.

About CARI

On behalf of the German Ministry of Economic Cooperation and Development and the Bill an Melinda Gates Foundation the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is implementing the Competitive African Rice Initiative (CARI) with the aim to significantly improve the livelihoods of rice farmers in selected African countries by increasing the competitiveness of domestic rice supply to meet increasing regional demand.

CARI is implemented in Nigeria, Ghana, Burkina Faso and Tanzania with the aim of reaching 120,000 African male and female rice producers. One of the main objectives of CARI is to increase the productivity and quality of paddy rice based on the development of sustainable and competitive rice production systems.

Authors, Contributors and Thanks

- Dr. Stefan Kachelriess, Evince Yegbemey, Yusuf Fouad, Matthew Adetunji and the technical team of CARI
- Dr. Philip Idinoba (AfricaRice)
- Kayode Ogunwale, (Images)
- All programs and partner institutions who contributed as well as the farmers who helped to improve the material
Other training materials available
The below training material and their content are linked to the GAP training

Doing good business with quality irrigated dry season lowland rice

Doing good business with quality rainfed lowland rice

Farmer Business School
Training notebook & workbook
Production system
Rice, Cow pea, Egusi
Nigeria
June 2015

GROSS
Evaluation
M1: Is farming a business?
M2: Do you know the units to know your income?
M3: Manage your farm for enough food
M4: Money out money in: Know whether you do a good business
M5: Decide your basic income
M6: Sustain opportunities to diversify your farm enterprises
M7: Manage your money throughout the year
M8: How to get good financial services
M9: Make more money with quality rice
M10: Benefits from membership in farmer organisations
M11: Good business with Good Agricultural Practices
M12: Becoming an entrepreneur in practice

Good Practices for Parboiled Rice

Healthy nutrition of rural smallholder families

Extension and Advisory Support

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1. Planning the Key to Success

My name is Aminat. I am a rice farmer from Nigeria. My objective is to have a lot of quality rice for my family and to earn a lot of money. To achieve that, I use the Good Agricultural Practices. My husband Yakubu helps me on the rice farm.

Q1: What do you think Aminat is thinking of?
   A: Aminat is thinking of making more money via feasible plans in production and marketing.

Q2: What is the most important factor to consider as a rice farmer before sowing?
   A: A rice farmer should understand the market trend and know how, where and whom to sell rice to before sowing.

Q3: What is Aminat doing about market before sowing?
   A: she prepares her sales with rice buyers

Q4: What is Aminat and her husband holding?
   A: Aminat and her husband are holding a bag of Rice.

Q5: What will make Aminat and her husband successful in their yearly productions?
   A: They will succeed if they always plan their activities with the cropping calendar and the growth cycle of their rice variety.
2. Know Buyers and Prices of Rice

Q1: Look at Aminat the rice farmer: What are the likely thoughts of Aminat?
   A: How to make more money from rice. Where to sell? Whom to sell to?
   (Farmers could also raise other likely thoughts; this should be guided by the extension agent)

Q2: Do you think Aminat require a group of rice farmers before she could sell? Give reason(s).
   A: Yes. If Aminat joins a group of rice farmers, she would be able to sell the paddy at a good price.
   (But members of the group are always ready to cooperate with each other and to plan together)

Q3: What are the types of rice farmer groups in your community?
   A: (GAP participants are to answer the question and with the aid of the extension agent)

Q4: Have you joined any of the groups?
   A: (GAP participants are to answer the question and with aid of the extension agent)

Q5: Why did you join or why didn’t you join?
   A: (GAP participants are to answer the questions and with aid of the extension agent)

Q6: Do you think Aminat did a contract with buyers of rice?
   A: Yes, Aminat did a contract with buyers of rice as seen from the picture

Q7: When is the right time to have contract with buyers of rice?
   A: At the beginning of the season.

Q8: In order to ensure trustworthiness and guarantee sustainability of Aminat’s agribusiness, what will Aminat do with the buyers of rice at the harvest or end of production year?
   A: Aminat will keep the terms of the contract with buyers of rice at the end of the season
3. Choosing the Good Plot of Land

Q₁: Name those images you could identify from the picture?
A: Aminat, grasses, sun, plot of land

Q₂: What is Aminat trying to do?
A: Aminat is observing to select the field to grow rice.

Q₃: What kind of land/field should Aminat choose for growing rice?
A: A land with good drainage and high water retention capacity such as clayey and loamy soils.

Q₄: What kind of land is bad for Aminat’s rice production?
A: A sandy soil

Q₅: Which other type of field is good for rice production?
A: A field that was formally used the year before for rice, groundnut, cowpea or soya beans is very good for the soil fertility.
4. Buy Quality Seed and Fertilizer

Q₁: What can you observe from the picture?
   A: Aminat is in an agro dealers shop

   : Aminat wants to buy seed and fertilizers
   : The shop sells certified seeds and mineral fertilizer

Q₂: What is the best time Aminat should buy seeds and fertilizer before sowing?
   A: At least 2 weeks before sowing.

Q₃: What is the importance of fertilizer to Aminat’s rice plants?
   A: It will help her rice plants to grow and tiller well and to produce big well-filled panicles and heavy grains.

Q₄: What are the quantities and types of fertilizers needed by Aminat for 1 season and 1 hectare?
   A: 200 kg NPK 15:15:15 (4 bags)

   : 100kg Urea (2 bags)
5. Clearing the Land manually

Q₁: What can you say about the people in the picture?
   A: They are clearing the land with hoes and cutlass

Q₂: When should land clearing be done?
   A: At least 6 weeks before transplanting to the main plot
   : At least 3 weeks before one sows the nursery.
   : When the rains have not started

Q₃: How should one treat the debris packed from land clearing?
   A: The debris should be allowed to dry and incorporated into the soil when ploughing as much as possible and the rest packed by the side of the field because it improves soil fertility
   : If the vegetation is infected, the debris should be burnt so as not to make the field contaminated or infected.
6. Cleaning the Land with Herbicides

Q₁: What can you say about this picture?

A: Yakubu is spraying the weeds with herbicides

Q₂: When is the appropriate time to use herbicide on the field?

A: At least 10 days before the first plough of the rice farm.

Q₃: What are the examples of herbicides that make work faster?

A: Veesate, Round up, Wuta-wuta, touch-down (but ingredient is glyphosate)

(The extension agents try to understand other ones not included here and confirm or condemn if its ingredients are not glyphosate).

Q₄: What are the rules for good use of chemicals?

Because Glyphosate can be injurious to our health, Yakubu strictly adheres to the safety rules in chapter 9 of manual.

(Extension officer to recommend best options or alternative to Glyphosate when available)
7. Soil preparation

Q₁: What can you observe from the picture?

A: Aminat uses a tractor service for the 1st plough of her field during land preparation

B: A second person prepares her land manually with a hoe

C: A third person plough and harrow his field with a plow

Q₂: What is the advantage of a good soil preparation?

Ai: Good soil preparation gives a good seed bed.

Aii: It opens the soil up for water and air to easily enter the soil.

Aiii: It helps to incorporate residues into the soil to maintain soil fertility.

Aiv: It destroys hibernating insect and noxious weeds, ETC

Aminat also apply organic manure like cow dung or poultry droppings and worked into the soil at this time, if available to improve soil fertility.
8. Establishing Bunds (Lowland level water management)

Q₁: What is Aminat doing after preparing the Land?

A: She is building bunds and she leaves the field watered by the next rains

Q₂: How does Aminat control the water in the basin?

A: She divides the field in basins (5m x 5m or 5m x 10m), level each basin properly well and build water control bunds around the basins.

Q₃: How does Aminat bring in flood water or remove excess water from her field?

Ai: By constructing small water canals around her farm to re-distribute water around her rice field.

Aii. By agreeing with her neighbours to construct canals that brings in water and take water out from their rice fields.
9. Preparing the Seeds

Q₁: What is Aminat doing in this picture?

A: Aminat is trying to prepare the seeds before sowing.

Q₂: Why is it good to treat seeds before sowing to the nursery?

A: It is good to treat the seeds to protect them against pests and diseases and to make them grow well.

Q₃: When is it good to treat the seeds before sowing to the nursery?

A: 3 days before sowing to the nursery.

Q₄: Can you list the procedures for preparing the seeds?

A: put the seeds into water for 24 hours
   : remove the bad, floating seeds and other impurities
   : put the seeds into a jute bag
   : put the bag into a warm and shady environment for 48 hours so that they sprout.

NOTE: Before all the above, Aminat has done an important test called “Germination Test” for the seeds. Do you know how to do a germination test? Extension agent explains the steps after a volunteer farmers’ explanation.
10. Establishing the Nursery

**Q₁:** What can you say about Aminat here?

* A: Aminat is working on her nursery bed.

**Q₂:** Why is Aminat establishing a nursery bed?

* A: Aminat does that in order to get strong seedlings and to save seed.

**Q₃:** Can you describe the best place to establish a nursery bed?

* A: A field close to the main paddy field that is sunny, fertile, well drained and which can be watered well. It should not be a place that is prone to being flooded.

**Q₄:** What should be a standard measurement of nursery beds?

* A: For 1 hectare of paddy, 10 nursery beds are required.

: Each nursery is 10m long, 1m broad and 4 to 6cm above the ground level so that the seeds are not taken away by rainwater.

: Each 1m x 10m bed is plant with 2.0 to 2.5kg of seeds
11. Nursery Operations

Q₁: Look at the picture, what is Aminat doing?

A: Aminat is broadcasting the sprouted seeds on the wet nursery bed by throwing them hard on the wet surface.

Q₂: What period do you think Aminat is doing this seeding of her nursery beds?

A: When the rains have started.

Q₃: What are the seed requirements for sowing seeds in the nursery?

A: For 1 nursery bed, use a maximum 2 to 2.5 kg of seeds (weight before germination)

: For 1 hectare, you need 10 nurseries beds of 1m x 10m each and 25kg of dry seeds.

: cover the seeds slightly with soil (half a cm) and 1 cm layer of mulch after broadcasting.

Q₄: What should Aminat do 7 days after sowing?

A: Aminat should flood the nursery to a depth of 2 to 3 cm if there is water. She slowly increases the depth to 5 cm until the day of transplanting. Also, remove the mulch cover 6-7 days after seeding, when the seeds have come up.
12. Use of Power Tiller

Q₁: What is Aminat doing?

A: Aminat is tilling her main rice field after the rains have stopped.

Q₂: Apart from tilling the rice field, what other things should Aminat do before ploughing and harrowing?

A: Aminat should let her rice field be watered or flooded by rain for 2 to 3 days to 2nd plough so that the soil becomes softer.

Q₃: What should Aminat do after flooding?

A: Aminat uses a power tiller to puddle the soil. This is because it saves time and hard work.

Q₄: What should Aminat do to make weeds rot and insects die?

A: Aminat should flood the field at 10 cm depth.

Q₅: What are the measures Aminat should take to enable good rice field and kill germinated weed seeds eventually?

A: Aminat should remove the water from the field after two weeks, and again use the power tiller to plough the field at 10cm depth, then harrow and puddle to kill the germinated weed seeds.
13. Leveling

Q₁: What can you observe from the picture?

A: The first person is using oxen for levelling.

: The second person is using hoe for levelling

: The third person is using flat wooden bar

Q₂: What is the importance of levelling?

A: Levelling helps all my plants to get water, become strong, grow at the same rate and it keeps the weeds little.
14. Fertilizing with NPK 15:15:15

Q₁: What should Aminat do after levelling?

A: Aminat should first of all remove excess water from the field.

Q₂: What can you identify from the picture?

A: Aminat is broadcasting NPK fertilizer

Q₃: What measures of fertilizer should Aminat apply to her rice field?

A: For 1 hectare, she needs 4 bags of 50 kg of NPK 15:15:15
15. Transplanting and Gap-filling

Q1: What can you say of this picture?

A: Aminat is transplanting seedlings into her rice field

Q2: When should Aminat transplant after sowing?

A: Aminat should transplant seedlings 3 weeks and not later than 4 weeks after sowing.

Q3: Why is Aminat using a cord as seen between two pegs? How should it be done?

A: Placing cord between two pegs makes Aminat’s work easier. She should make holes along the cord with a distance of 20cm between each hole.

Q4: How should Aminat do the planting of the rice seedlings?

A: She plants such that the green part of the plant remains above the ground surface. She puts 2 to 3 plants per hole and leave 20cm between and along the lines.

Q5: What is expected of Aminat to do after a week of transplanting?

A: After 7 days of transplanting, Aminat should refill the gaps of missing plant stands.
16. Buying Good Insecticides and Fungicides

Q₁: What can you infer from the picture?

A: Aminat is buying insecticides and fungicides

Q₂: What cautions should be observed in buying insecticides and fungicides?

A: Only when I see attacks, I buy approved and recommended insecticides and fungicides from authorized dealers.

Q₃: Mention some examples of insecticides and fungicides that are currently recommended.

A: Fungicide - Mancozeb 2kg/ha

Insecticide - Cymbush, Cyper-1, Karate, Deltaforce

(The extension agents try to understand other ones not included here and confirm or condemn if its ingredients are not recommended).
17. Fighting Diseases and Insects

Q₁: Look at the picture, what do you see Yakubu doing?

A: Yakubu is applying insecticide or fungicide on his rice field

Q₂: What are the likely symptoms that made Yakubu to spray his rice field with insecticide and fungicide?

A: Maybe rice blast, showing brown spot or grain discoloration. (reference to posters “Main pests on rice crop” and “Main beneficilals on rice crop”)

Q₃: How does Yakubu protect himself?

A: He wears protective cloth, gloves, glasses, booth and nose covers and he does not spray against the wind.

Q₄: What are the other precautions Yakubu observes before he sprays?

A: Remove excess water before he sprays

: He only sprayed in the morning or evening on an enlightened time without rain or wind.
18. First Manual Weeding

Q₁: What is Aminat doing in this picture?

A: Aminat is weeding of rice field

Q₂: What is the best time for Aminat to weed or rough weeds after transplanting?

A: The best time is 2 to 3 weeks after transplanting.

Q₃: Why is the 1ˢᵗ weeding important?

A: To prevent weeds from taking the food and water of rice plants during tillering and rapid growth.

A: Stops weed from taking the space and sun light of rice plants.
19. Chemical Weeding

Q₁: What is Yakubu doing in this picture?

A: Yakubu is applying herbicides to weeds
   : Yakubu is doing chemical weeding

Q₂: What is the best time for Yakubu to apply herbicides after transplanting?

A: The best time is 3 weeks after transplanting.

Q₃: What are the precautions one ensures before spraying herbicides?

A: Remove water from the field
   : Ensure you wear safety materials.
   : Do chemical weeding only on a clear and not rainy or windy day

Q₄: Name examples of good herbicides for your rice fields.

A: Rycester, orizopus, basagran
20. First Fertilizing with Urea

Q1: Can you say something about this picture?

A: Aminat is broadcasting urea fertilizer

Q2: When is Aminat fertilizing her paddy field after transplanting?

A: Aminat is fertilizing her paddy field with urea 3 weeks after transplanting and just after 2nd weeding.

Q3: Why is it necessary to do first fertilizing with urea?

A: so that rice plants develop many tillers

Q4: What is the measure of urea per hectare in the first fertilizing phase?

A: 1 hectare, use 50kg of urea (1 bag of urea).

Q5: What is required to be done before broadcasting urea on paddy field?

A: Drain excess water to a level of 3 to 5 cm.
21. Second Manual Weeding or Rouging

Q₁: What is Aminat doing in this picture?
   A: Aminat is doing the 2nd weeding or rouging her rice field
   : Aminat is doing manual weeding the 2nd time

Q₂: What is the best time for Aminat to weed after the first one?
   A: The best time is 2 to 3 weeks after the first weeding or 6 weeks after transplanting.

Q₃: Why is the 2nd weeding important?
   A: It prevents weeds from taking the food and water of rice plants during flowering and grains formation
   : Stops weeds from growing flowers and seeds which could make this harvest dirty and will grow to disturbs next season rice plant
22. Second Fertilizing with Urea

Q1: What can you see Aminat doing in this picture?

A: Aminat is doing second fertilizing with urea of her paddy field.

Q2: What time is the best to do second fertilizing with urea?

A: 7 to 8 weeks after transplanting.

Q3: What is the measure of urea per hectare during the second fertilizing with urea?

A: for 1 hectare 1 use 50kg (1 bag).
23. Purify the Variety by removing off type

Q1: What can you see Aminat doing in this picture?

A: Aminat is rouging out all off plant types to keep her variety and paddy field pure.

Q2: What time is the best to remove off types?

A: First at the 11th to 12th week after transplanting (or 14th to 15th week after seeding roou out all off type. When off types are many they can be left to mature but harvested before the main type at about 14th to 15th week or 17th to 18th week after seeding.

Q3: What is the advantage of rouging out or harvesting off types?

A: To purify the variety and reduce contamination of paddy or seeds.
24. Protecting the rice against bird attack

Q1: What can you observe from the picture?
   A: A field without weed and protected with a net.

Q2: When is the best time to chase birds?
   A: When the grains start developing
25. Harvesting and Drying

Q1: What can you observe from this picture?
   A: Aminat and Yakubu are harvesting Rice.

Q2: When is rice field ready for harvesting?
   A: 4 to 6 weeks after flowering
   : 16 weeks after transplanting

Q3: How are Yakubu and Aminat harvesting their rice?
   A: They cut the rice stems with a sickle 15 to 20 cm above the ground
       : They bundle the rice stems and make sure the panicles do not touch the ground
       : Dry the rice 5 to 10 days after harvesting
26. Threshing

Q1: What is Aminat doing in this picture?

A: She is threshing

: She uses a mechanical device

Q2: What is the advantage of using a mechanical device?

A: It makes work faster and less tiring

: I do the threshing on a mat or tarpaulin so that my paddy doesn’t break and does not get dirty

: I can also thresh by beating the rice against a barrel or a log of wood.
27. Winnowing

Q₁: What is Aminat doing here?

A: Aminat separates the empty or immature grains and residues from the well-filled grains.

: For that she uses a mechanical device for winnowing

: She can also use a winnowing fan or a winnowing bowl when it's windy

Q₂: What advantage is involved in using mechanic device for winnowing?

A: It makes work faster and less tiring.
28. Drying

Q₁: What is Aminat doing here?
   A: Aminat is sun-drying the paddy.

Q₂: Why is it necessary to dry the paddy?
   A: To reduce the moisture content before milling.

Q₃: On what is Aminat spreading her paddy rice?
   A: Aminat spreads her paddy rice on mat or tarpaulin with a thin layer of 3 to 4 cm.

Q₄: Why is Aminat not drying her paddy rice on the bare floor?
   A: So that dirt and stones do not enter the paddy.

Q₅: What are the ideal practices while drying paddy in order to achieve best quality?
   A: Turn rice over every hour while drying it.

   : Dry rice for 2 to 3 days until the moisture content is 12 to 13%.

   : Put the paddy into polypropylene bags after drying; I can also use the PICS triple bag

   : Ensure no dirt enters the paddy.
29. Storing the Paddy

Q1: What do you see Yakubu doing?

A: Yakubu is storing the paddy

Q2: What is the best place to store paddy?

A: Store paddy in an airy, cool and well-protected space on a palette where it is protected against insects and animals.

Q3: How does one keep the store safe for storing paddy?

A: The store should be far from where I keep my livestock

: Clean the space well before putting the rice inside.

: Use dried chilli pepper to keep pests away.

: One can also store with activated silica gel powder to dehydrate insects in the bulk.
30. Selling the Paddy

Q₁: What can you identify from this picture?
   A: Aminat is about to sell her rice.
      : A buyer has come to buy from Aminat
      : Aminat places her rice on weighing scale, weighs before selling.

Q₂: Aminat used quality and improved rice variety, and good agricultural practice, what is the expected yield from her farm per hectare.
   A: It is expected that approximately 4.0 tons of rice (4000 kg) from 1 hectare of rice farm.

Q₃: Aminat organizes the selling of rice with her farm group. Why is that necessary?
   A: in order for her to get good price for rice.
31. Child wellbeing

Q1: What do you see in these pictures?

Ai: For 1st picture, Aminat sends her child to school.

Aii: For 2nd and 3rd pictures we see Aminats’ son who goes to school. He can now help/advise his illiterate mother to control the dosage of fertilizers, chemicals and other soil fertilization methods for better rice production.

Q2: What do you think about these pictures?

Ai: As a good rice farmer I send my children to school. I save money and pay their school fees and buy school materials in time.

Aii: The children do not do hard or harmful work on the rice farm. I also do not use children of other people for any hard and dangerous work.

Message: It is not recommended to send children to the field to work and replace labor. To send them to school is the best investment.