

Development of Improved Adaptive Options to Climate Change for Sustainable Livelihoods

Drought prone area Activities

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2008 12 2



Bangladesh



**Nachole &
Shapahar,
Rajshahi
Region (for
drought
area)**

Mostly fallow land after T.aman rice



Farmers Searching for water (12-14 ft deep) in rabi season, Barind area



BMDA dams are dry in Rabi season



Farmer
pumping
drinking
water from
160 ft deep





Fallow area and drought affected crops in Barind area

No chance of addition of crop residue to soil, making the soil rapidly fragile & holding less moisture, hence more Drought

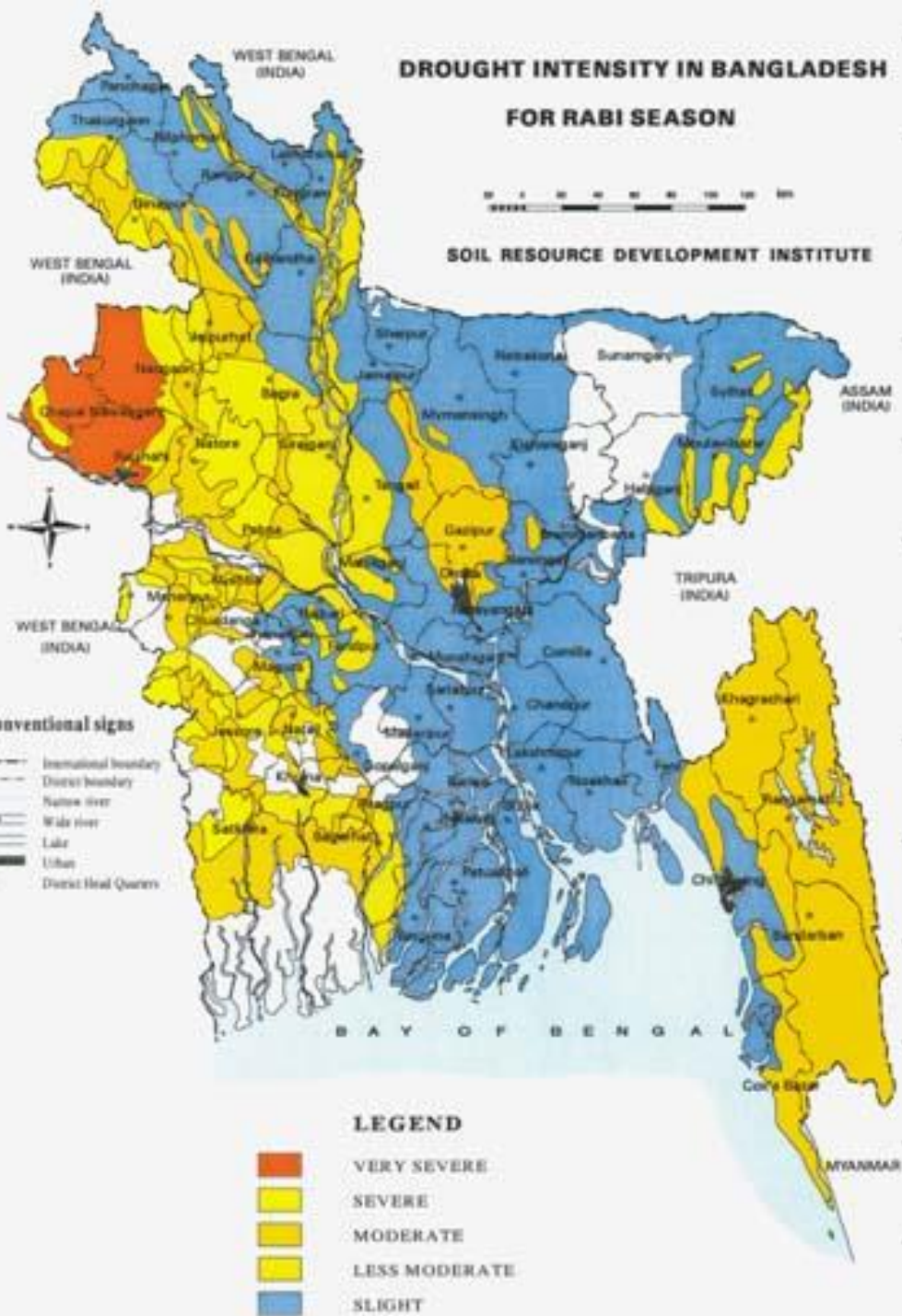


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DROUGHT INTENSITY IN BANGLADESH FOR RABI SEASON

0 20 40 60 80 100 120 140 Kilometers

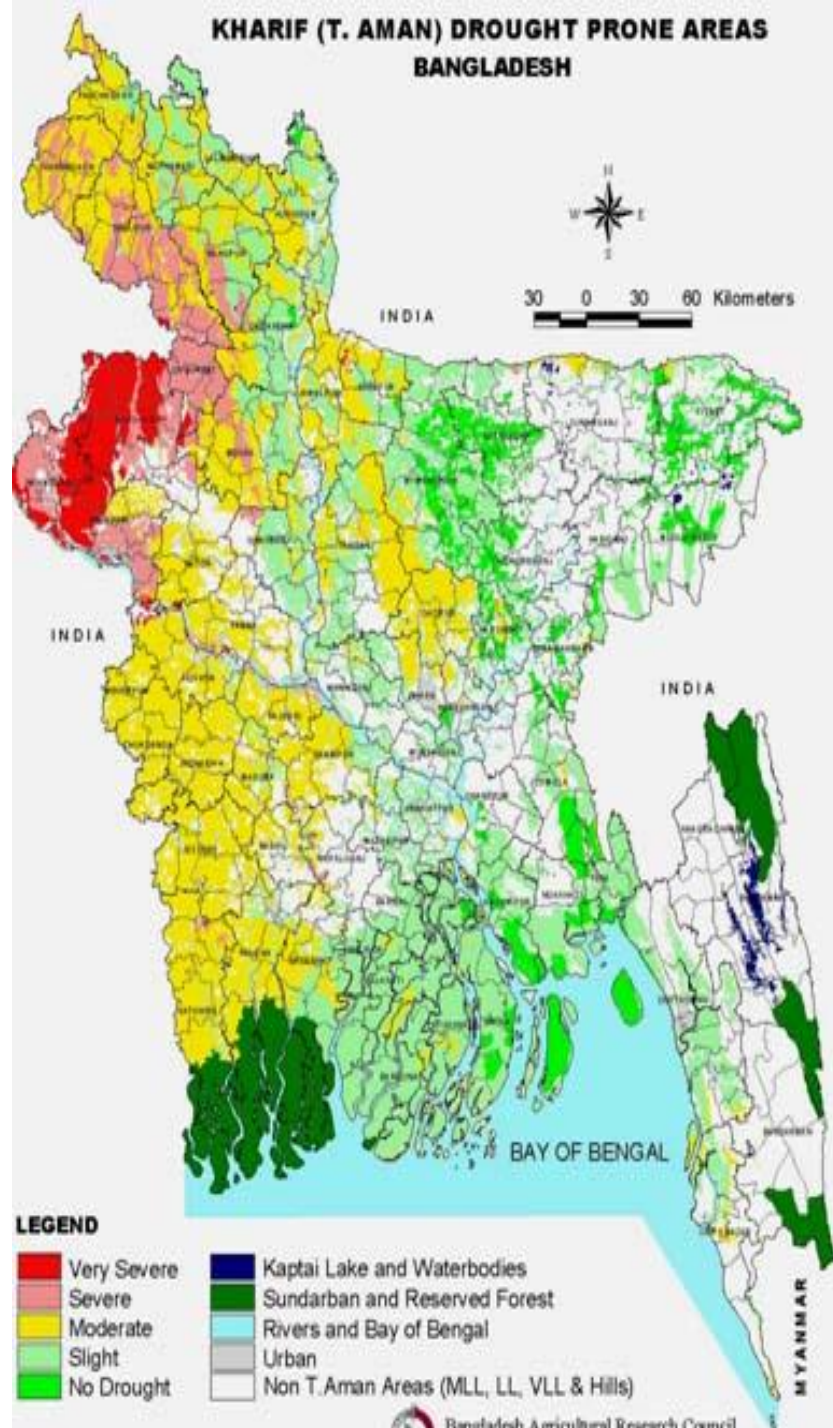
SOIL RESOURCE DEVELOPMENT INSTITUTE

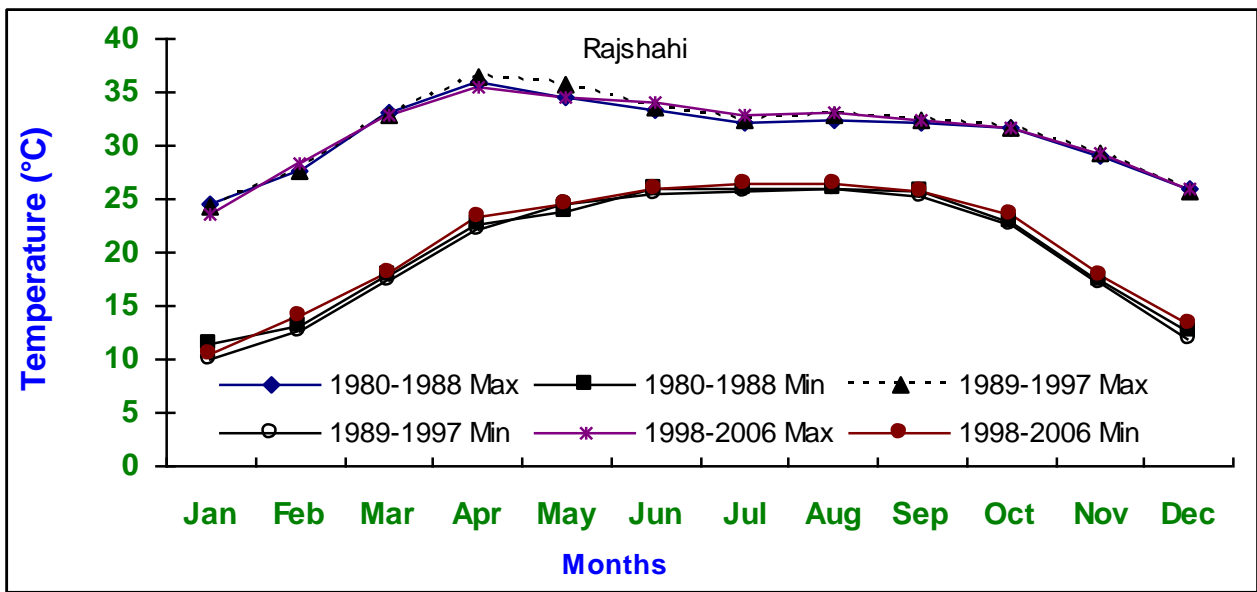


KHARIF (T. AMAN) DROUGHT PRONE AREAS BANGLADESH



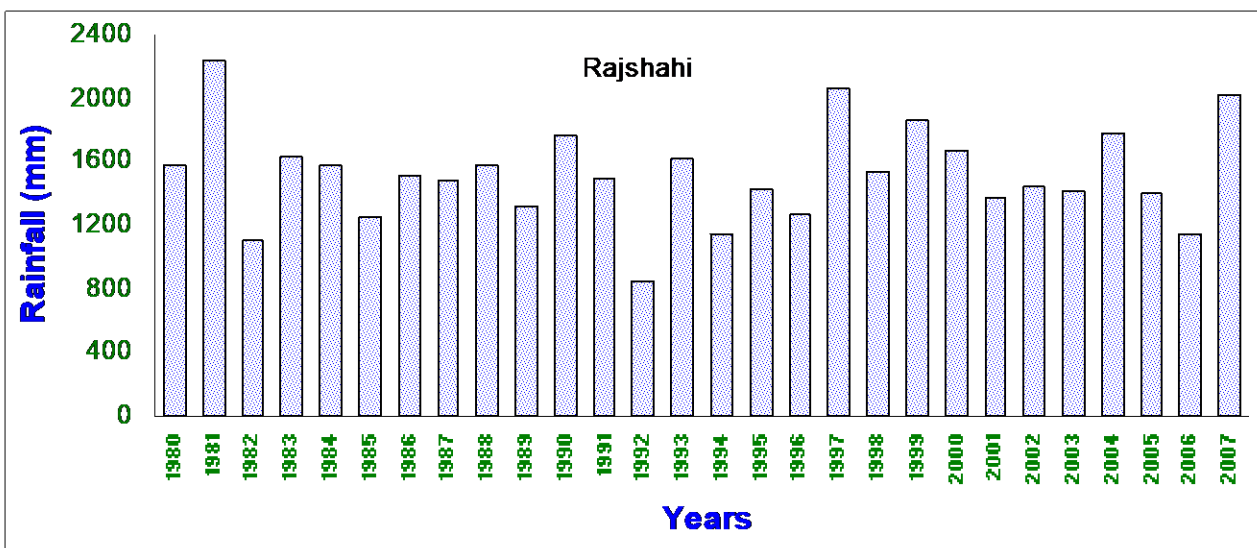
30 0 30 60 Kilometers





Average temperature increases +0.30 °C

Fig. 1. Mean monthly maximum and minimum temperature in Rajshahi during 1980-2006



Mean yearly total rainfall 1075±325 mm (decreases -4.41%)

Fig. 2. Yearly total rainfall in Rajshahi during 1980-2007



BMDA trying to bring river (Padma) water for irrigation, but for small area



Re-excavation of natural canal (Khari) for supplementary irrigation in Kharif-II and early rabi season



Government owned big pond for livelihood of local people,
but insufficient for dry season rice irrigation



Boro rice (rabi season) cultivation even in top part of elevation, requiring large quantity of underground water



Late harvesting of T.aman rice is a problem for timely plantation of dry land Rabi crops

Focal Group Discussion

on
Improved Adaptive Capacity to Climate Change for Sustainable
Livelihoods in the Agriculture Sector (BGD/01/004/01/99)

Venue: Sapahar, Naogoon, Date: 4 June 2008

led by: Food and Agriculture Organization of the United Nations (FAO)

Organized by: On-Farm Research Division

Bangladesh Agricultural Research Institute
Barind station, Rajshahi



2008 6 4



FGD Findings, Shapahar and Nachole

- **Problems-**
- Acute water scarcity in Rabi and kharif-I season and water table goes below 100 ft
- **Due to siltation, depth of pond has reduced , hence, storing of surface water has also decreased**
- In dry season, pond water is being sold @ Tk. 80,000/ac for crop cultivation
- Pod borer is major problem for chickpea cultivation
- Late release of land from T.aman rice due to cultivation of long duration rice Swarna which delays the planting of rabi crops
- **Drying of harvested T.aman on the crop field create problem for preserving soil moisture, because of this practice soil moisture quickly goes out and rabi crop could not be established**
- Farmers prefers comparatively fine rice, so that they cultivate long duration T.aman rice (Swarna) which delay/hamper planting of rabi crop
- **Short duration T.aman rice (BRRI dhan 32, 33, 39) gave low yield in comparison to Swarna. The above BRRI dhans gave 4-5 maund/bigha less yield than Swarna.**
- Due to unavailability of surface water natural fish has almost disappeared
- Scarcity of fodder/green grass due to drought causes poor health of livestock
- **Because of fuel crisis, farmers are using cowdung as fuel which hampers use of cowdung in crop field.**

- **Prospects-**
- **T. aman (Swarna), chickpea, linseed, barley and black gram can be cultivated in rainfed condition.** On the other hand, water melon, khira, aroid, sweet gourd, mustard, potato (local), onion, garlic, cabbage, cauliflower and bitter gourd can also be cultivated with the help of pond and 'khari" (natural small canal) water.
- For preservation of surface water excavation and re-excavation of ponds and kharies should be done.
- **Case fish culture is possible in khari/pond**
- **Drought tolerant crop like mankachu, moulovikachu, drumstick and sponge gourd should be cultivated in homestead**
- **Neem, palm tree and date palm tree (khejur) should be planted for biodiversity and extra income. Those trees are drought tolerant.**
- **Mango and jujube fruit saplings should be planted in homestead and adjacent fields, as those are also drought tolerant, bring a good ensured return**
- **Ram and goose raring should be increased, as these two can survive by grazing i.e raring cost is very small**
- For increasing soil fertility, compost should be made in each homestead.
- **For Barind a new pulse crop like mungbean may be cultivated in kharif-1 season using small pond water and after pod harvesting brown manuring should be done for maintaining soil organic matter.**
- **Rain water harvest may be initiated for drinking/household use and irrigation**
- Creation of market facilities vegetables and watermelon to city is important for getting reasonable price
- Farmers training should be given on different crop, livestock and fisheries technologies`

Programs for Kharif-II-2008 and Rabi, 2008-09 (for both Sapahar and Nachole)

- Homestead vegetable cultivation- 10 household (vegetable patterns will be finally selected after preliminary trial and based on farmers choice and market price)
- **Niche/ecosystem** **Vegetable**
- **Sunny area**
 - -Kangkong (Gima Kolmi),
 -
 - -Indian spinach
 - -Red amaranth
- **Shady area**
 - - Mankachu (aroid)
 - -Moulovi kachu (aroid)
- Tree support
 - Sponge gourd
 - Ash gourd
 - Potato yam
- Trail
 - Bottle gourd
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 - Sweet gourd
 - Country bean
- On house roof
 - Ash gourd
 - Sweet gourd
- **House boundary fence**
 - **Sponge gourd /country bean**
- **House boundary/backyard**
 - **Drumstick-2 plants/ homestead**
 - **Papaya-2-3 plants/homestead**
- Fruit tree
 - Jujube (Apple kul and BAU kul)-2 plants/ homestead

Field crops-2008-09

- Early T.aman (Swarna)-Chickpea (Two block preferably 10 bigha/block for each location)-farmers of the block should be ensured to transplant T.aman rice at the earliest to pave the way for timely release of land for chickpea. **ICM would be used to control pod-borer of chickpea**
- Mixed crop-Chickpea with linseed/barley-1-2 Bigha/location
- Wheat-Mungbean-T.aman (with supplementary irrigation)-1-2 Bigha/location

Other activities

- At least 6 bamboo bunch management (by BFRI technology) should be done (as bamboo is a drought tolerant scarce resource in Barind area, can generate cash at the time of need). As bamboo head is dying by fungal disease which could be improved through use of proper fungicide along with adopting other management in March-April).
- Creation of at least one Drumstick (cv. Baromasi) garden (4-5 decimals)/location
- Compost preparation (by using household and kitchen waste and cowdung) at least in 6-homestead should be done and subsequently apply it in vegetable crop/field crop
- Case culture of fish in khari/pond may be conducted- 6 case/location
- De-worming and vaccination of cattle, goat and ram should be done- 100 animals/location
- 2-3 lines of Napier grass in the outer boundary of homestead (those farmers have cattle)



“জলবায়ু পরিবর্তনের সাথে কৃষি ব্যবস্থার সমন্বয় গান” প্রকল্পের আওতায়
বাস্তবায়নের আঙ্গিনায় বহুব্যাপী সবজী চাষ
কৃষাণীর নাম: শ্রীমতী জোন্না রাণী
গ্রাম: মহলীপুর, মাপাহার, নওগাঁ।
সহযোগিতায়: কৃষি মন্ত্রণালয়, জাতিসংঘের প্রযুক্তি সহায়তা (FAO/ACE II)
অর্থায়নে: জাতিসংঘের খাদ্য ও কৃষি সংস্থা (FAO/ACE II)
বাস্তবায়নে: সার্বজনীন গবেষণা বিভাগ, বিশ্ব জল আই,
ব্রজেন্দ্র বেন্দ্র, রাজশাহী।



2008 12 2



Keeping own seed
of Kangkong (a
highly water
efficient vegetable)



সকলকে শক্তিশালী করতে মাথা কৃষি ব্যবস্থাকারী কর্মসূচী
কমলাচিহ্ন আঁটার বহুব্যাপী স্কীম
কৃষকের নাম: মোহন জয়নুর রহমান
গ্রাম: মন্ডীপুর, মাদারগঞ্জ, নওগাঁ।
সহযোগিতায়: কৃষি মন্ত্রণালয়, আশাপুর, নওগাঁ।
অর্থায়ন: কার্জনগর মাথা ও কৃষি মন্ত্রণালয় (FAO/LACC II)
বাস্তবায়নে: সার্বভৌম গবেষণা বিভাগ, বিজ্ঞান আর আই
বাংলা: কেজি, বাকশাথী।



2008 12 2



Fresh vegetable collection from home garden and cooking for healthy dish



Termite a widespread problem in upland of Barind

Timely wheat plantation has prospect, requires small amount of water for irrigation





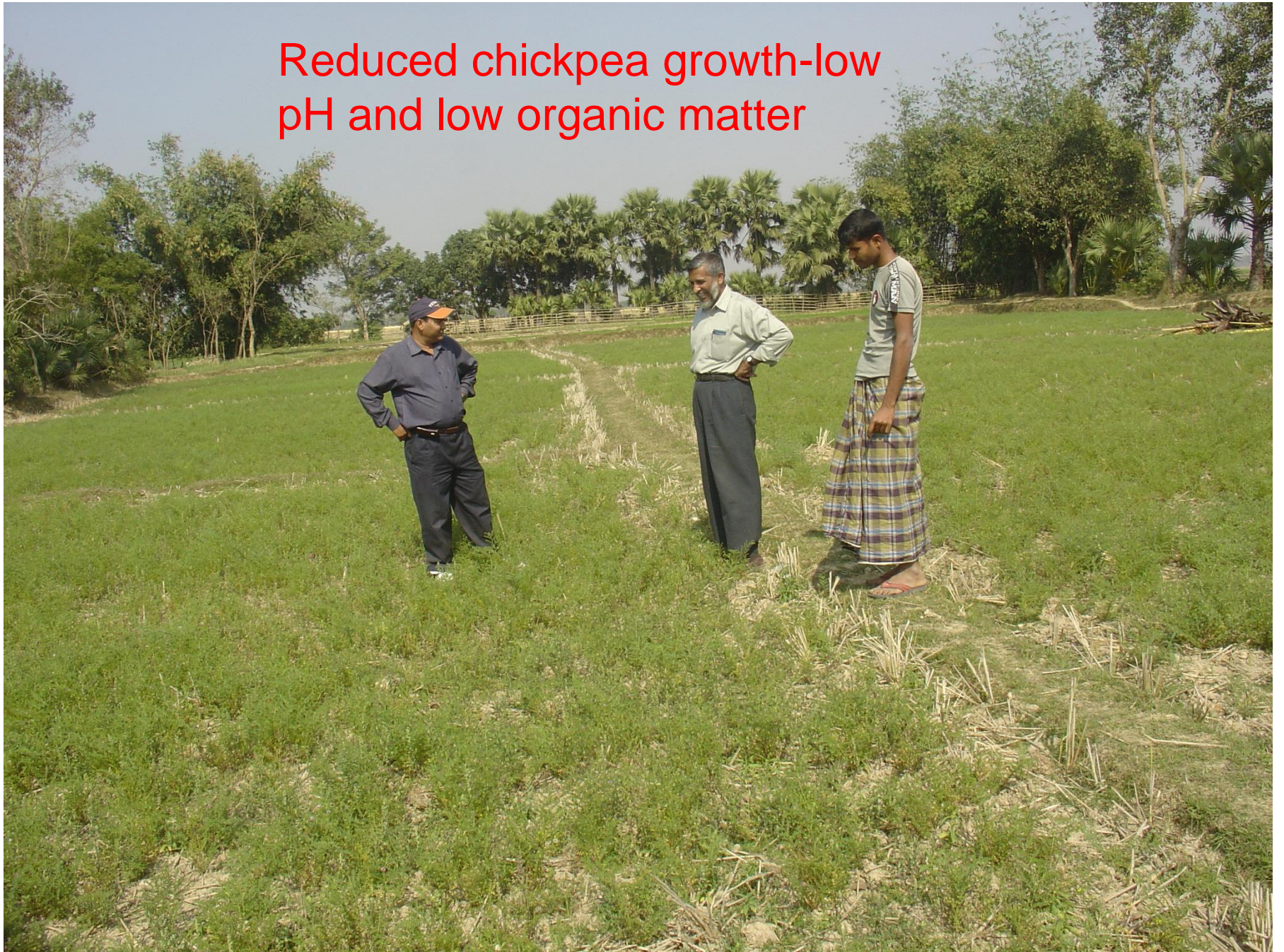
Bringing rainfed fallow land under chickpea+barley cropping-prospective



Chickpea needs field capacity amount soil water for germination only, deep root collect water from deeper




Reduced chickpea growth-low
pH and low organic matter



Good prospect of chickpea + barley as dry land rabi crop



A photograph showing a dense field of green chickpea and barley plants. The plants are growing in a field of Barind soil. The text is overlaid on the right side of the image.

Rained but good growth due to deep root and prolific root system of both chickpea and barley. Up to 105 cm deep root in Barind soil



Looking for Pod borer and BGM. The two big enemies.



Installation of deep-tube well diminishing dry land rabi crops endangering long-term environment



Reserach on Moringa management: *Moringa a drought tolerant and medicinal plants – farmers used it leaves and pod as vegetable*



T₅
FP

Mringa tree
Randomization
for treatment



Flower is coming in Moringa tree

Local Vet. Doctor addressing



Drought affected animals





Vaccination and de-worming of animals and duck for Livelihood improvement



Sautal a tribal women whose livelihood is endangered by climate change & De-forestation



Thank You

Adaptation to drought
for children



2008 8 5