



Scaling Up Research Based Agricultural Technologies and Achieving Impact

Objectives:

- The “Big Picture” – Describe key elements in scaling up a research based agricultural technology.
- Briefly discuss the detailed lessons learned, mainly from scale up of hermetic grain storage:
 - Intellectual property management
 - Supply chain development
 - Market development and media
 - Public-private partnerships
 - Gender

Some Definitions:

- *Scale* – To justify an international research investment the technology must benefit millions.
- *Outcome* – An outcome is a step along the way to impact. Outcomes might include: research reports, scientific publications, workshops, pilot testing, etc. Synonyms include “achievements”, “results”, and “accomplishments”.
- *Impact* – Benefits experienced by large numbers of people. This might be in income, food security, health, standard of living or other metric.

Big Picture – Keys to Scale Up:

- *Solve Their Problem* – Not your problem, or society's problem, or the world's problem.
- *Fit Their Budget* – Ideally, without on-going subsidy, because no one is ready to pay that subsidy in the long term.
- *Involve the For-Profit Business* – Most new technology will require inputs and the only sustainable source is for-profit business.
- *Be Ready to Go Beyond the Researcher Role*

In the hermetic grain storage case – What was the problem?

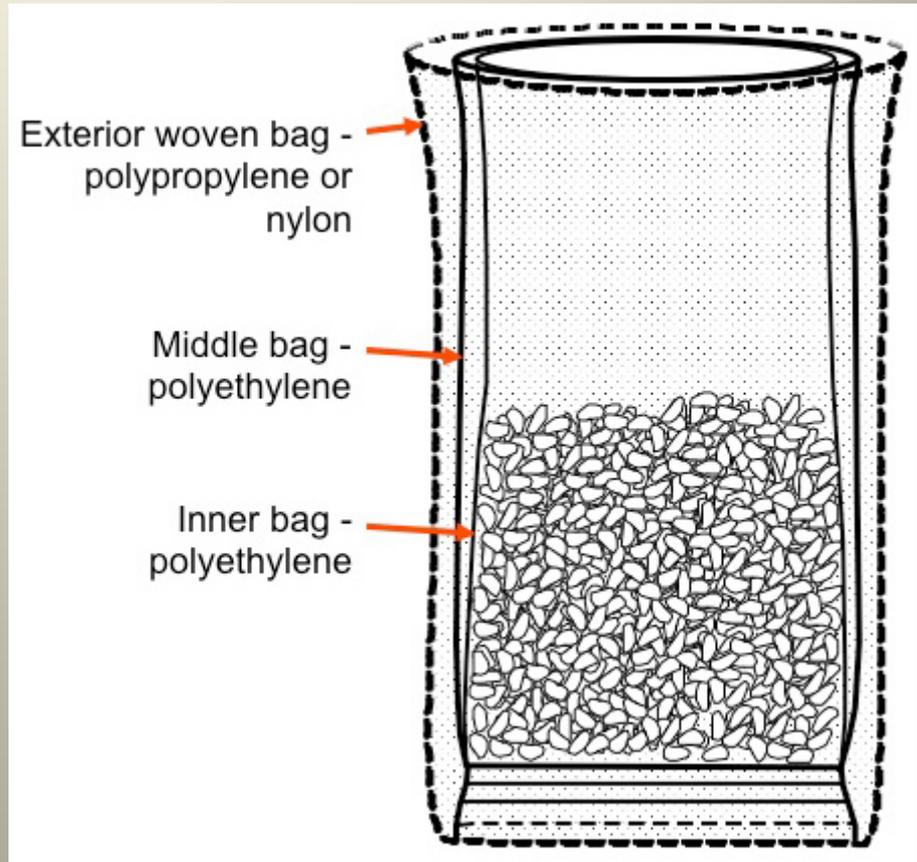


Cowpeas at harvest are good quality, but the prices are low.

A few months after harvest price are higher, but unprotected cowpeas are heavily damaged



Purdue Improved Crop Storage (PICS) bags led the scale up of hermetic grain storage



Cowpea storage in triple layer plastic bags was developed by a team of Purdue and Cameroonian researchers led by Larry Murdock in the late 1990s funded by the USAID Bean/Cowpea CRSP.

PICS Technology is Profitable for Farmers

PICS Storage Margin Examples from Mali. Price is in FCFA and in parenthesis are prices in US dollar (\$1= 500 FCFA)

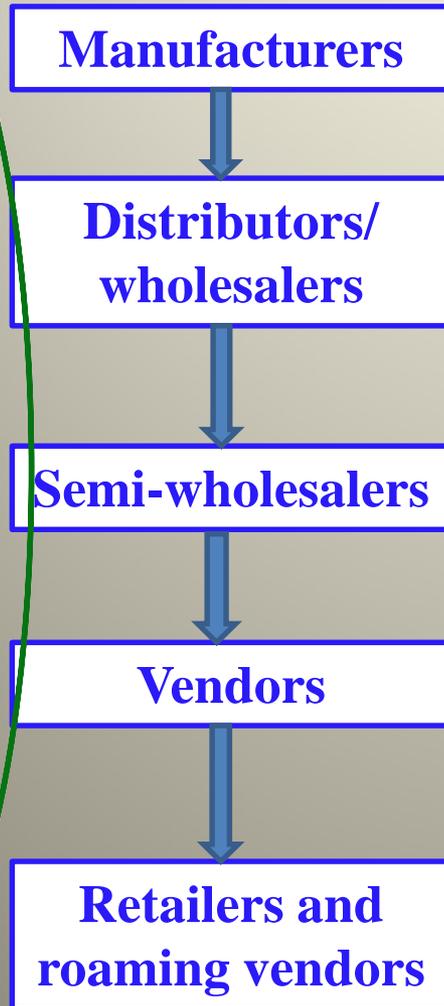
Cowpea Region	Price at closing the bags Oct- Dec 2009	Price at open the bag Mar- Apr 2010	Margin per 100kg using PICS* bags for 6 months
<i>Segou</i>	175 F/kg (\$0.35)	365 F/kg (\$0.73)	19 000 F(\$38)
<i>Mopti</i>	100 F/kg (\$0.20)	225 F/kg (\$0.45)	12 500 F(\$25)
<i>Sikasso</i>	150 F/kg (\$0.30)	350 F/kg (\$0.70)	20 000 F (\$40)
<i>Koulikoro / Kayes</i>	200 F/kg (\$0.40)	330 F/kg (\$0.66)	13 000 F (\$26)

In Mali the retail price of the PICS bag is around 1150 FCFA (\$2.30)

- PICS bags can be reused for more than one year
- Cowpea could be store for one year
- Cowpea can be consumed directly
- Effective even with quantities less than the size of the bag

PICS Bag For Profit Supply Chain

-Media efforts with Radio and TV
- PICS consultant



Work with local manufacturers and entrepreneurs

Over 1000 PICS vendors in West and Central Africa by 2012



Going Beyond the Researcher Role

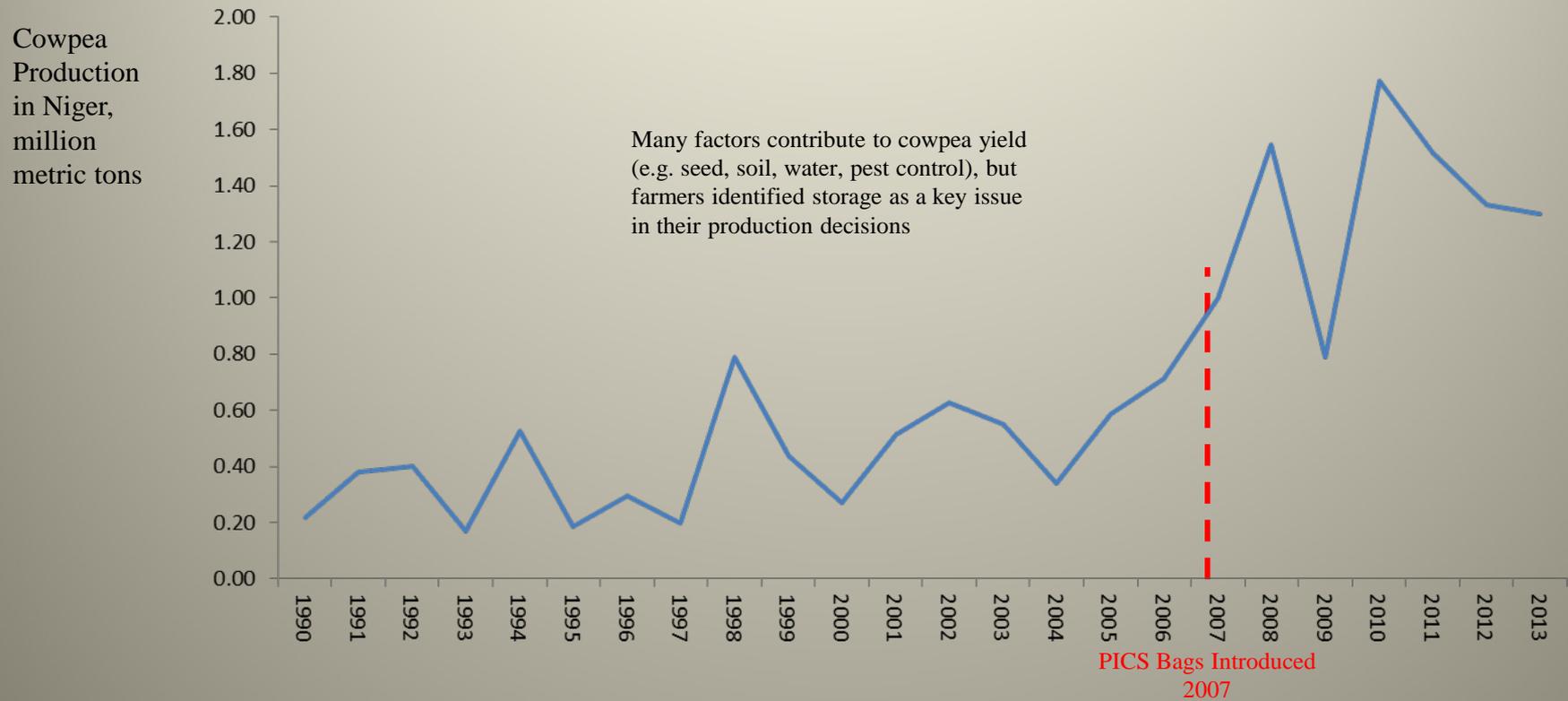
- PICS team members were ag scientists who immersed themselves in the specifics of plastics manufacturing
- PICS team members worked with anyone interested in better grain storage: African SMEs, faith based NGOs, US military....
- PICS team members worked in conflict and post-conflict countries (e.g. Afghanistan, DRC, Tchad, Nigeria...)



Photo: Dieudonné. Baributsa

Purdue team visits Shindand Plastics, Herat, Afghanistan, Oct. 2011

Scaling Up Can Move the Needle on National Priorities:



Hermetic bag storage helped resolve a bottleneck in cowpea production in Niger and resulted in quadrupling production with higher farm income and improved food security.

Long Lasting Impact

- The PICS bag supply chain is sustainable. Manufacturers continue to make and sell bags even in difficult situations when donors and NGOs pull out (e.g. Mali in 2012) because it is profitable.
- PICS has many imitators attracted by profits.
- PICS has motivated many companies to invest in research and development to make even better grain storage bags for African farmers.



Intellectual Property Management for Scale Up

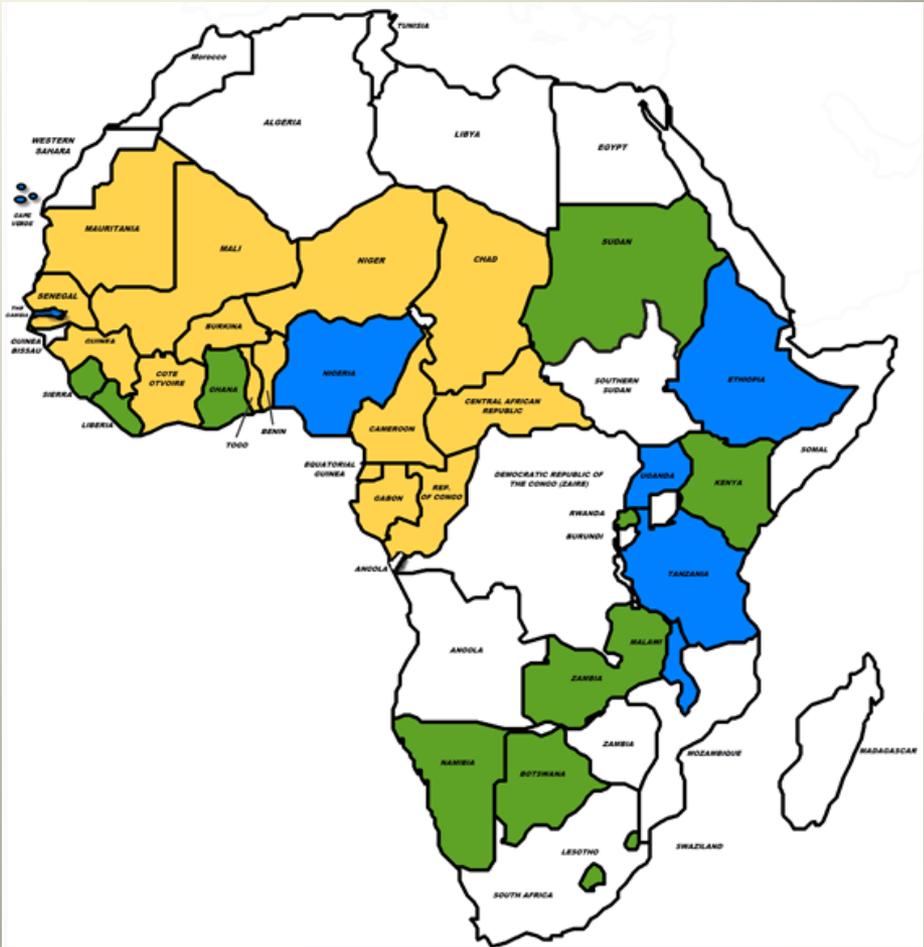
- IP may be needed to motivate private investment in new technologies.
- Patents are widely understood, even they are often not respected in developing countries.
- Trademarks require more explanation in business negotiations, but are a useful tool.
- Developing country businesses will pay IP license fees, but transactions costs are high and the business model depends on technical and management support.

PICS IP Business Model

- PICS is not patented, but the trademark is registered.
- Purdue licenses the PICS trademark and technology to local manufacturers and distributors.
- A license fee is charged to help Purdue provide technical support. That fee may be waived when there is outside donor funding.
- So far the PICS license fee does not generate enough cover Purdue management costs, so licensing is being spun off to PICS Global, a company registered in the UAE.
- Key decisions are:
 - Who will be licensed?
 - Under what conditions?

PICS registered in the US and:

- OAPI countries
- Madrid International Trademark System African countries
- Nigeria
- Ethiopia
- Uganda
- Tanzania
- Malawi



LEGEND	
Property Management Affiliation	
Madrid	Green
OAPI (African Organization for Intellectual Property)	Yellow
NA	Blue

Supply Chain Development is a Key Challenge in Technology Scale UP

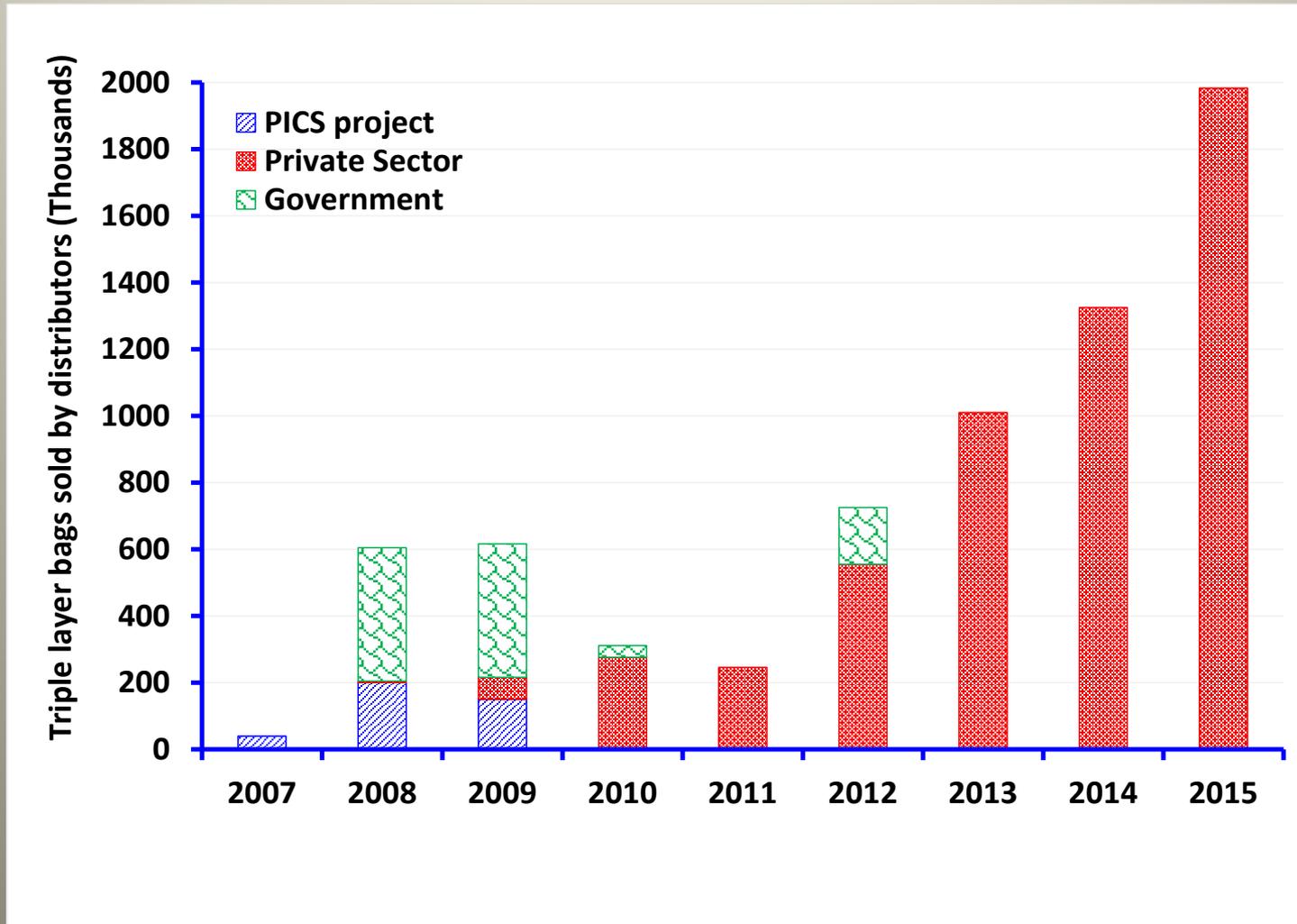
Problems include:

- Manufacturers and distributors are reluctant to invest in a new product
- Vendors have very limited capital
- Legal system not well developed in West and Central Africa
- Farmers complain about the distance to the point of sale

Manufacturing lessons learned in PICS:

- Local manufacturing is best if it can be cost effective
- Balance local manufacturing with the economies of scale
- Better to work with an entrepreneurial manufacturer

PICS Bag Supply Chain Developed from Project to Private Sector



Evolution of the PICS Supply Chain

Despite the challenges, the PICS supply chain is transitioning from project activity to private business:

- Moved from consignment to 20% down-payment
- In 2010, all distributors ordered PICS bags with no project funds involved
- Some distributors are adapting distribution models from other sectors of the economy (e.g. cell phones)
- Allow distributors to set the price of bags during the second year

Lessons Learned

Distribution

- Distribution systems in Africa depend on personal relationships
- Multiple layers are required, in contrast to the trend toward “flat” distribution systems in North America and Europe
- Better to work with literate wholesalers
- Ag input vendors need year around sales
- Risk and credit are linked

Lessons Learned

Demand Development

- It is possible to reach millions of people in Africa with improved technology
- NGOs can be very good technology transfer partners in their intervention areas
- National extension services have been great technology transfer partners for PICS

Lessons Learned

Media

- Direct communication to farmers is essential
- Demonstrations are a great way to reach farmers
- Radio a way to reinforce the message
- Many NGOs reluctant to be involved in commercial of messages
- Cell phone video has great potential for visual communication about inputs.



Radio used to reinforce the PICS.
This is a photo of the station in Dagarama Takaya, Niger.

Posters and pamphlets in local languages – Bambara Poster below:

Sokise kononitan lamaracogo koro "PICS" koro



1 Ka koro PICS san a feereba yamaruyalen fe.



2 Ka sokise lamarata laja kojuman (tijenew be tomo ka bo a la).



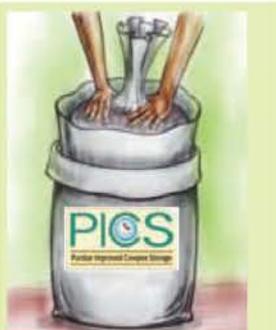
3 Ka koro saba ninnu bo kononitan na k'a laje, koro fila minnu be kononita na ni wo t'u la, walima n'u faralen te. Ni wo be koro la walima n'a faralen don, fen te se ke lamara a koro.



4 Ka sokise do ke kononita koro koro. O b'a don diya koro to fila koro. I b'a yatemine ni fije te koro ju la.



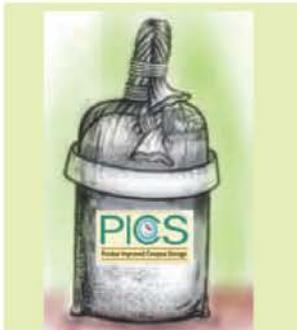
5 Ka koro don kononitan koro ka kononitaaboro lafa kononita sokise la. I be to ka koro yigiyigi ka fije be a koro. I b'a yatemine ni sokise binnan te koro ni kononitan ce.



6 Ka koro fa hake la, dasiriyoro ka koro a la. I be koro da bisi ka jigin fijen be: ka bo a koro.



7 Ka kononita koro da melenge, k'a siri ni juru ye, walima manajuru. I be koro dasiriyoro sanfela fana melenge, k'o kuru kononitan na k'o fana siri ni juru ye walima manajuru.



8 Cemancelaboro fana be dasiri kononitaboro dasiricogo la. Ka laban ka boraba k'o cogo la; n'o ye nilonboro ye.

Koro dasiricogo



Foko:
kononitaboro

Filanan:
Cemancelaboro

Sabanan:
Nilonboro

Contact

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PICS Cell Phone Video Clips

- Showing is better than telling for explaining bag closure.
- Video clips bring the PICS message to those who could not attend a village demonstration.



- Few West African farmers have access to TV, but many have cell phones that will play video clips.
- The video clips go viral, passed from phone to phone with Bluetooth.

Lessons Learned

Role of Gender in Scaling Up

- Information on gender allocation of tasks is key to targeting information and training
- For PICS:
 - Even in areas where women do not often participate in crop production (e.g. Northern Nigeria), they are often responsible for grain storage
 - Separate demonstrations for all women groups were essential in areas where women do not participate in mixed gender public meetings
 - As with all other groups, direct communication is essential for women (i.e. husbands who participated in PICS activities often did not tell their wives)



PICS extension relies on village demonstrations. In some areas separate demonstrations are organized for women's groups

Lessons Learned in Scaling Up

- Keys to scaling up research based ag technology are:
 - Solve their problem
 - Fit their budget
 - Involved the private sector early in the process
 - Be willing to go beyond the researcher role
- Pay attention to:
 - Ownership of intellectual property management
 - Supply chain development
 - Market development reinforced by media
 - Public-private partnerships
 - Gender roles which determine who needs information and training



Questions or Comments to:

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