Sri Lanka Trip Report
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February 7-12 2005

Objective: Review tsunami damage to paddy fields and develop recommendations for their rehabilitation.

Itinerary:

Date	Locality	Contacts
7 Feb	Kandy Batalagoda	DG Dept. Of Agriculture & other staff Staff Rice Research & Development Institute
8 Feb	Uhana Kalmunai, Ninthaur	Agrarian Services Center Farmers & Agrarian Services Center
9 Feb	Pothuwil	Farmers
10 Feb	Ambalanthota Welipatanwela	Agrarian Services Center & Rice Research Station Farmers
11 Feb	Colombo	Ex D. CARP, IWMI, Secretary MOA, Sarvodaya

This report includes observations and recommendations on 6 themes:

1. **Rice**
2. **Water quality**
3. **Farmers**
4. **Non-rice (including fishing)**
5. **Information supply**
6. **Labor shortages**

Thanks
We would like to thank Dr SL Weerasena (DG DOA), Mr Shantha Emitiyagoda (DD Ext), the other members of DOA and the many farmers who gave their valuable time to show us their fields and to share with us their observations and experiences.

Sri Lankan villages and families of the coastal regions have been devastated by the 2004 tsunami. This report lists observations and simple recommendations to help restore rice-based livelihoods.

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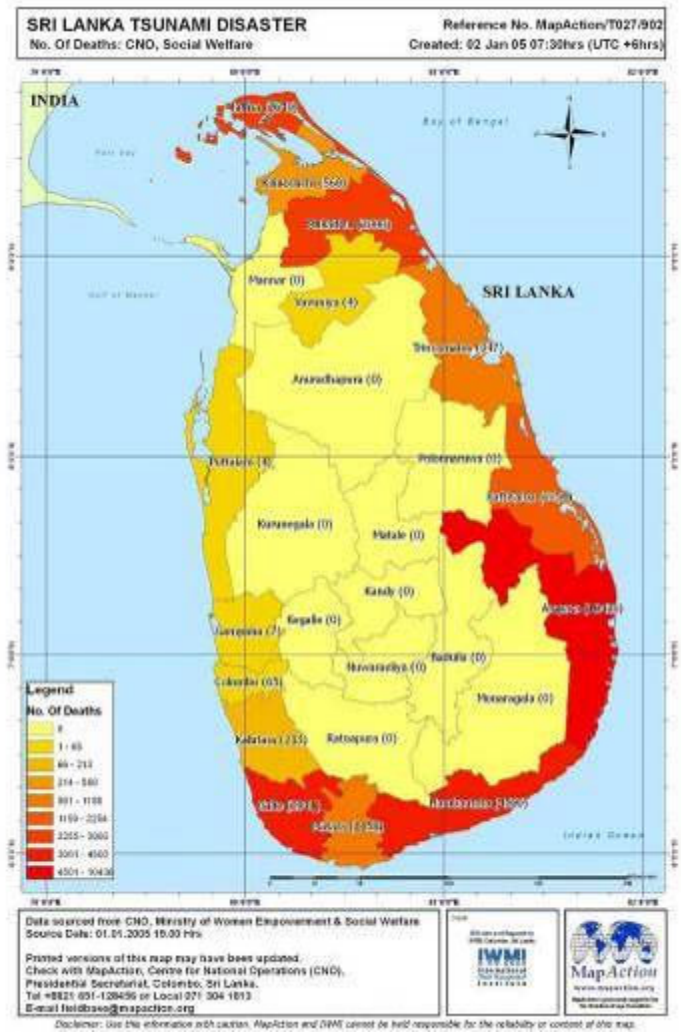
Area affected

Staff of the Department of Agriculture (DOA) briefed us on the tsunami affected areas (See map). They detailed their initial findings on the extent of land and crops affected.



Number of Deaths: CNO Social Welfare (Source www.iwmi.org)

At this point of the coast, the tsunami wave topped these palm trees (around 11 m high) and spread 900 m inland. Person at base of tree shows relative height.

1. Rice

Field observations

The total area of rice land affected in Sri Lanka by the tsunami is relatively small. Initial DOA figures suggest that 1500ha of standing crop was affected and this would likely be at least doubled if fallow land was included. The total number of people affected in rice production is estimated at >15,000. We observed three types of field damage:

1. **Fields already in recuperation - The majority of affected fields we saw had open drains and had received recent rainfall shortly after the salt intrusion. These fields were already showing signs of vegetative recovery (e.g., "dead" rice plants sending out new tillers and/or grass weeds growing). Many of these fields had acceptable EC readings (< 4mS/cm),**
2. **Fields with serious salinity problems - A lesser number of fields that we saw had either complete crop loss or large patches of crop death across the field. These fields were typically observed to have closed drains. The black layer reported in some fields appears to be a layer of rotting vegetative material in those fields that still have very saline surface soils. The top soils of these fields typically had very high unacceptable EC readings (> 4 mS/cm to more than 20 mS/cm) and many showed complete dispersion when placed in water (indicating high levels of Na).**
   Note: **These non-flushed saline fields were obvious from the lack of vegetative growth of any form and by the presence (often) of a surface black layer (of decaying vegetative matter), and**
3. **Fields with sand deposits/debris - A small number of fields close to the shore had serious problems of sand deposition on top of the existing fields.**


Fields that have been flushed or received rainfall and had drains open are already showing signs of recovery.


Fields that did not have drains open continue to have high levels of salinity and no signs of plant growth.


Debris (left) in many and sand in fields close to the ocean (right) were left in farmers rice fields.

Recommendations:

Field rehabilitation

1. **Drainage - Clean drains and drainage canals**
2. **Salt flushing – Flush fields (not yet flushed) prior to cultivation. Fill fields with good water and allow them to stand before draining.**
3. **Stubble - Don't burn crop stubble**
4. **Debris – Burn or remove debris – but not the stubble.**
5. **Use of rice husks - Incorporate (if available) un-burnt rice husks during land preparation (either during or after the first plowing)**
6. **Plough layer – Don't deep cultivate**
7. **Symptoms in crops - If next season crops show symptoms of salinity (e.g., burnt leaf tips), then drain and flush fields with fresh water. It may be useful to have slightly more water than usual in affected fields to dilute any residual salt.**
8. **Water source – Use water from above ground water storage systems wherever possible**
9. **New Salt tolerant varieties – It seems unlikely that new varieties will be needed over and above those already being developed by the DOA. Existing non-saline tolerant varieties will likely suffice in rehabilitated fields.**
10. **EC meters – Provide EC meters for field monitoring of affected fields. These could be placed with staff of the Agrarian Service Centers.**
11. **Sand deposits – In the few fields with sand deposits, level the deposits and manage as above.**
12. **Fact sheet - Develop a fact sheet on the rehabilitation process and make available through the cyber extension and other Agrarian Service Centers.**

Conclusion: Prospects for speedy field rehabilitation appear good, if field drainage and flushing with non-saline water of affected fields can be implemented quickly. Cyber extension centers could be used to provide information on the rehabilitation process (and possibly monitor progress).

2. Water quality

Field observations

It appears that the primary cause of the salinity problems in wells is from the surface entry of saltwater. Of the wells tested, all wells filled by the tsunami wave still exhibited serious problems of salinity (>4 mS/cm). One well that had had greater use, had lower levels. There was somewhat conflicting evidence on the effect of pumping. One pumped well had higher levels of salinity than the surrounding non-pumped wells.

We found no evidence of underground salt water encroachment into non-tsunami affected wells (including wells in the affected areas and those further from the shore line).
We suspect the affected wells have a salt water "bubble" around their intake area caused by surface pressure from the wave. The report by Karen Villholth of IWMI helped explain the situation. She found a salt gradient in wells having received rainfall. Thus it seems likely that many of the "pumped" wells were likely only partially pumped from the top – leaving the more saline water at the base of the well.
Water in canals from the national irrigation system had excellent quality (<0.4 mS/cm).

Wells in many areas such as this well in a village devastated area (left) were filled with seawater from above. They need to be fully pumped and monitored for EC (right) until suitable for drinking and/or irrigation.

Recommendations

1. **Pumping – Given the present uncertainty of the well situation, we suggest that initially a couple of tube wells that had been contaminated by seawater be pumped and have the EC monitored for a number of hours. The reason for this is that tube wells will be quicker to pump and evaluate. A submersible pump (rather then the more common centrifugal pump) is preferred in the open wells as it is capable of pumping from greater depths (> 5m). Unless lowered down the well, centrifugal pumps can only draw from approximately 5-6 m depth.**
2. **Well cleaning – If the above is found to reduce EC levels, then pump the open wells for 6-8 hours (or if EC meters are available) until the EC drops below 2 mS/cm. Many people active in well rehabilitation were recommending the addition of chlorine (2-4 l/well) to reduce the possibility of bacterial infection.**
3. **EC meters - Provide EC meters to field staff involved in rehabilitating wells. Meters could also be placed at the Agrarian Service Centers.**

Conclusion: While most wells appear fine – there is conflicting data on the effects of well pumping of the saline affected wells. Pumping and monitoring in a few selected areas will help clarify this situation.

Note: All above ground irrigation water from major irrigation channels was <0.4 mS/cm and thus suitable for irrigation. The non-contaminated wells were < 1.2 mS/cm.

3. Farmers

Observations

During farmer discussion groups, some farmers viewed cash handouts as an alternative to farming.

Recommendation:

1. **Independence not dependence - Ensure that all government and non-government assistance encourages farmers and other affected community members to rebuild their livelihoods and independence and not rely on hand outs (i.e., not build dependence).**

Conclusion: Good intent must build independence not dependence.

Some farmers reported a worsened scarcity of labor for the rice farming.

4. Non-rice (including fishing)

Observations

There is obvious concern about family income and the availability of protein given the destruction of the national fishing capacity and other local non-rice farming activities. Local contacts indicated that even when fish are available, many people are hesitant to eat them due to the fish coming from where many people disappeared.

Recommendation

1. **Water sources (local options) - If non-saline irrigation water is available, then legume and other income generating crops can be grown.**
2. **Bed farming (local options) – bed farming will help the salt affected areas.**
3. **Pulse crops – A national pulse crop strategy could be developed to ensure protein needs are met over the short to medium term.**
4. **Fact sheets – Develop fact sheets on farming alternatives and provide through the Agrarian Service Centers**

Conclusion: There is a rapid need to provide information of alternate crops and their management. Agrarian Service Centers seem well placed to play this role.


Upland crops in affected areas need clean water supplies and can be grown on beds to reduce the effects of salinity.

5. Information supply

Observations

The pilot cyber-extension model seems to be working well with farmers and this seems an appropriate means to reach a greater number of farmers with information they need in a more participatory and user-friendly manner. To strengthen the cyber-extension centers, 5 multi-media projectors were donated under the DOA-IRRI project.

Recommendations:

1. **Fact sheets – need to generate simple fact sheets on paddy and non-paddy crop crops. Topics should include: Field rehabilitation, well rehabilitation,. Salinity tolerance of a range of fruit and vegetable options.**
2. **Laptop computers – supply laptop computers (building off the cyber extension experience) to AI office of the Agrarian Service Centers. Laptops may well be a better option than the PCs as they can be taken to the villages and used with portable multi-media projectors for raining and other information sharing activities.**
3. **EC meters - supply EC meters to AI office of the Agrarian Service Centers.**

Conclusion: Clients of Cyber-extension units appear to benefiting from the greater access of extension workers to information through ICT capacity and from the more participatory approach being used by staff.

Extension and development workers need information in easily understandable and readily accessible forms.

6. Labor shortages

Observations:

We had a number of reports of labor shortages especially for harvesting. Harvesting was being increasingly done by small combines imported from India, China and Japan. During the trip, 150 memmoties (hand hoes) were donated to farmers affected by the tsunami. Some of those interviewed indicated the problem arose from direct losses of laborers and some highlighted that refugees collected food and money when located in the refugee camp. Some felt that this may have encouraged at least a portion of the potential labor force to stay away from the fields.

Conclusion: There is a need for a speedy assessment of the performance of the various combines in terms of harvesting efficiency and machine reliability. When the brief summary report is ready, then this information should be made available through the Cyber extension centers.

Labor saving devices being introduced into the area (such as the small combine harvester above) need to be evaluated and simple performance reports made readily available.

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