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Emergency Market Mapping & Analysis Pakistan Flood Response

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Sindh Final Report



In Collaboration with



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This rapid market assessment is the result of interagency collaboration that took place in flood-affected provinces of Pakistan during September 2010. Agencies who provided planning logistical support and field staff for this assessment include: IOM; Oxfam GB, ACTED; ACF; CARE International; and Save the Children. Other agencies who contributed staff and other resources include: Mercy Corps; World Vision; SDF; WFP; and BRAC. Funding for this assessment came from ECHO and IOM.

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Cover Photo: Alixandra Fazzina

Executive Summary

This report summarizes the findings of an inter-agency assessment team that looked at the impact of the devastating monsoon floods of 2010 on market systems in Sindh, Pakistan. Four market commodities or services were selected for the assessment, each of which is of critical importance to millions of subsistence farmers and landless labourers in Sindh who were identified as our target population.

- The research into the **wheat flour** market system in Sindh indicates that a significant portion of wheat grains stored by rural households is likely to have been lost due to the floods. The immediate impact is that rural families who are usually self-sufficient in wheat flour throughout the year are now reliant on urban-based retail markets. Prices for wheat flour have risen by 17% in Sukkur since the floods, and are likely to increase in the coming months. While there appears to be an adequate short-term supply of wheat grain and flour in government warehouses and mills, the challenge of rehabilitating flood-damaged cropland for the winter wheat crop may prolong wheat shortages and lead to increase consumer prices.
- The large numbers of farmers and landless labourers in Sindh whose most valuable asset is their milk producing livestock (primarily cattle and buffalo) informed the selection of the **livestock fodder** market as the second critical market under investigation. Flood damages to standing crops of green fodder and sugar cane (whose leaves and stalks form a significant crop residue for livestock late in the year) are likely to be high, and will exacerbate the annual “fodder gap” that exists in late winter. Losses of stored wheat straw, a low cost fodder material is also assumed to be significant. While the assessment team found some evidence of de-stocking or selling off their livestock assets, this appeared to be related to a need for cash rather than an absence of livestock fodder and feed.
- **Agricultural labour** was the third market system under review. The damage to standing crops and likelihood that winter season planting will be delayed will reduce employment opportunities for many agricultural labourers in Sindh. Wage rates, especially for piece meal work, are under threat as seasonal employers are hiring more workers to do the same amount of work. The assessment team also found that the lack of employment opportunities, especially for landless labourers and indebted workers, is likely to lead to an increase in rural to urban migration.
- The fourth market system examined was **bamboo and timber poles** as a shelter material. While the flooding had little impact on local and regional plantations where these crops are grown, much of the bamboo and timber poles is intended for the paper pulp industry. Given the slow rate at which the international community is providing emergency shelter support to flood affected families, the available supply is likely to meet a moderate, short-term demand. The biggest impact on the bamboo and timber pole market is likely to occur in March 2011 when the government housing reconstruction programme begins.

Following each section are possible response options that NGOs, IOs, coordination clusters and donors might consider. The overall objective of these response options is to *restore the income* of small farmers & agricultural labourers and *strengthen their role* in agricultural production and recovery. For the shelter materials, the objective is to *support the repair and/or replacement of flood damaged houses* through local market systems, and taking into account disaster resistant construction technologies.

Emergency Context

Flood response context

Of the four major provinces affected by the monsoon floods, Sindh was the worst in numbers of people impacted and displaced. Although less than 300 persons died, over 30% of the more than 7.2 million flood affected people in Sindh have been temporarily displaced. While other flood affected Pakistanis in Punjab, Baluchistan and KPK have returned home and are beginning the rebuilding of their livelihoods and houses, many people in Sindh remain with host families or in organized and informal camps in urban centres and along roadways.¹

Over 7.4 million acres of land were flooded, including 2.7 million acres of cropland. Main agricultural crops such as rice, cotton and sugar cane have been severely affected, with some districts reporting over 80% losses. While the wheat crop had been harvested several months before the floods, it is not known how much of the wheat grain in storage has been lost. As much agricultural land in Sindh remains under water, or is covered with sand and silt deposits from the flooding, planting for next year's wheat crop is likely to be delayed.

General Economic & Livelihoods context

Sindh is the third largest province of Pakistan in area (54, 700 square miles), bordered by Baluchistan (west), Punjab (north), Arabian Sea (south) and India (East). Sindh is a major centre of economic activity in Pakistan, contributing almost 30% of the total national tax revenue. It has a diversified economy ranging from heavy industry, manufacturing and finance based around Karachi; and agricultural production throughout the province. The most productive agricultural land is located along the Indus River in the centre of the province, and the 8 million acres of irrigated cropland that receive water through irrigation channels from the Indus River. Major crops include rice, wheat, cotton, sugarcane, bananas, mangos and animal fodder crops.

Viewed on a provincial level, Sindh produces a more food and animal feed crops than it consumes. Yet on a district level, only 6 of the 23 districts in Sindh produce a crop surplus – while 9 districts are either extremely deficient or deficient in food self sufficiency. Only 16% of the Sindh population is considered to have acceptable levels of food consumption.

Over 80% of the rural Sindh populations have agricultural based livelihoods. As less than 64% of these rural people own land, working as sharecroppers (haris) is a common practice of the poor. Although bonded labour arrangements are illegal in Pakistan, many poor farmers and labourers are heavily indebted to landlords, some with family debts that pass from generation to generation.

EMMA Methodology

Introduction to EMMA

EMMA (Emergency Market Mapping and Analysis) is a rapid market analysis designed to be used in the short-term aftermath of a sudden-onset crisis. Its rationale is that a better understanding of the most critical markets in an emergency situation enables decision makers (donors, NGOs, government, other humanitarian actors) to consider a broader range of responses. It is not intended to replace emergency needs assessments, more thorough household economic analyses such as the Household Economy Analysis (HEA), or full market assessments, but rather adds to the body of knowledge in the post-crisis period by providing timely information

¹ Sources: UN Pakistan Fact Sheet, *Floods in Pakistan*, 21 September 2010; UN OCHA, *Pakistan Monsoon Floods SitRep 26*, 21 September 2010; Government of Sindh, Provincial Disaster Management Authority: *Damages Due to Rain / Floods 2010*.

about the structure and functioning of key markets in the short term so that immediate programming can be based on market knowledge.

EMMA in Pakistan

The Pakistan EMMA is an ECHO funded multi agency approach to market assessment (Oxfam GB, IRC, ACTED, ACF, and Save the Children) with some additional staff and resource commitments from IOM, WFP (CC & SDF), Relief International, Care (SPO & Awaz), Concern Worldwide, MEDA, Mercy Corps, BRAC and World vision.

The Pakistan EMMA assessment focused on food security related markets, with a small transitional shelter element. It involved a rapid 10-day field assessment² which, analysed the impact of the floods on 4 main types of critical markets (which vary slightly between regions):

KPK	Sindh	Punjab
Wheat seed	Wheat flour	Wheat seed
Small ruminants	Fodder	Fodder
Agriculture labour	Agriculture labour	Agriculture labour
Timber poles (for shelter)	Bamboo poles (for shelter)	

The objective of the market assessment and analysis was to assist agencies in identifying appropriate programme interventions.

Rationale for Selection of Critical Markets in Pakistan

Critical market systems are those that “played, play, or could play a major role in ensuring survival and/or protecting livelihoods of the target population” in an emergency context³

The Pakistan Emergency Food Security Alliance (PESFA) members selected four main groups of critical market systems:

- Staple crops
- Labour
- Geo-specific markets (livestock, fodder, vegetables)
- Shelter materials (bamboo, timber, bricks).

PESFA members then used the following criteria for selecting a shortlist of market systems:

- significance and urgency to protect life and livelihoods,
- Degree of impact of the crisis on the market,
- Fit with the participating agencies’ mandates,
- Seasonality of markets and produce,
- The possible response is consistent with government and donors’ plans,
- The feasibility of the response options.

The second level of selection took place during the EMMA workshop. Participating fieldworkers were asked based on their knowledge of the local context to identify specific market systems that would be important to consider, particularly relating to food security, livelihoods and early recovery. The Islamabad shelter cluster was responsible for the prioritisation of timber/poles, plastics and bricks, with the field team narrowing this down to timber/poles for KPK and Sindh, but with Punjab having insufficient staff to pursue a shelter market.

² Almost two months after the first floods struck in July 2010.

³ EMMA Toolkit, p. 46.

EMMA in Sindh

Identification of Assessment Area:

In Sindh, some of the most severely flood affected areas are districts in the north and northeastern parts of the province.⁴ Three of these districts were selected for the EMMA assessment: Sukkur, Khairpur, and Shikarpur. Main criteria used for selecting these districts include: severity of damages; numbers of affected population; location of displacement camps; presence of market actors relevant to chosen market systems; road accessibility, and poverty indicators.

Table 1 Target Districts , Sindh

	Crop Area Affected <i>acres</i>	Total Area Affected <i>acres</i>	Persons Affected	Persons Displaced in Official Camps	Ave. Daily Income
Khairpur	46,055	589, 251	345, 900	100, 699	< \$ 1.25
Shikarpur	110,189	401, 831	790,000	80,831	< \$ 1.25
Sukkur	102,300	255,058	247,913	106,056	< \$ 1.75

As the EMMA toolkit was designed to be administered by generalist staff, the teams consisted of project officers or community mobilization staff of NGOs and CBOs. Four assessment teams, with 3-5 members in each team, looked at a single market system during the field-based research from 15 –25 September 2010. Of the 15 team members in total, 4 were local staff who spoke Sindhi and had worked in the area before. The remainder of the team members came from other provinces of Pakistan, or Karachi and southern Sindh. Most of the team members participated in EMMA orientation sessions held in Islamabad the week prior to the fieldwork.

The EMMA teams in Sindh used semi-structured interviews; gender-differentiated focus group discussions; and household profile interviews with flood displaced people to understand the priorities, preferences and coping strategies (gap analysis). Semi-structured interviews were used with market producers, suppliers and intermediaries to help analyze the capabilities and constraints of the commodity or service(s) of the assessed market system (market analysis). Individual and group consultation sessions with NGO representatives; government authorities, and commercial actors were held to discuss possible response options in the coming months (response analysis).⁵

Summary of Household and Markets analysis used.

The EMMA team in Sindh identified small farmers and landless agricultural labourers as the key target groups for analysis. Although attempts were made throughout the field work to speak with both flood-displaced and flood-affected farmers & labourers, standing floodwaters and road closures prevented the Sindh team from accessing the latter group.⁶

⁴ Government of Sindh, Provincial Disaster Management Authority: *Damages Due to Rain / Floods 2010*.

⁵ On average, each EMMA team interviewed 80-100 flood displaced farmers and/or agricultural labourers; 10-14 market intermediaries (wholesalers, traders, contractors and retail agents); 2 –4 medium or larger scale producers; and 16 NGOs during the field work.

⁶ Flood displaced people refer to those who are living in official and informal camps near urban centres, while flood affected people include those who may have been temporarily displaced, but have since returned to their homes.

Table 2 Target Groups - Sindh

Target Groups	Essential Characteristics
Small Farmers	<ul style="list-style-type: none"> Owns or leases less than 5 acres of land; Highly dependant upon own food production; Owns some livestock; produces milk for sale & consumption. Likely to have seasonal debts. Likely to return to places of origin as soon as flood waters recede.
Landless Agricultural Labourers	<ul style="list-style-type: none"> Works seasonally as <i>hari</i> for food or cash. Highly dependant upon others for food production. Owns 1-2 livestock (if any); produces milk for consumption Likely to have year-to-year debts. Less likely to return to their places of origin if income earning Opportunities or shelter are absent.

Four market commodities and/or services were selected for assessment in Sindh. Two are agricultural commodities (*wheat flour* and *livestock fodder*), while a third is *agricultural labour*. These three critical market systems form the basis for agricultural market systems reviewed under this assessment. The fourth critical market is construction material (*bamboo & timber poles*) for emergency shelter.

Wheat is a primary food staple in Pakistan, contributing to over 50% of the daily calorie food intake. Most of the wheat consumed in the country is grown in Punjab and Sindh, and is harvested in April and May. Although the 2010 wheat crop had been harvested by the time of the monsoon season, the amount of wheat grain in storage that might have been damaged by the floods is unknown, but suspected to be significant. Of particular concern are the wheat stocks of subsistence level and other small farmers who grow wheat for year round consumption, and seeds for the coming year's production. Without these stocks, these farmers will become new consumers competing for a limited wheat supply. The key analytical question that the EMMA assessment team attempted to answer was: *How have the floods affected the supply and availability of wheat flour in Sindh?*

For many rural people, large livestock such as buffalo and cattle provide milk, cash income, fuel, and a valuable asset that can be sold in times of need. On average, over 75% of the feed resources of livestock is from grazing and crop residues, while another 22% comes from grasses and hay.⁷ As much of the land available for grazing has been flood affected, the availability of animal fodder such as wheat straw, forage crops or mill by-products is crucial to helping poor farmers protect their livestock asset and earn cash from selling milk. The key analytical question under review here is: *What are the main constraints affecting the supply of fodder for the poorest livestock holders in the flood affected area?*

It is estimated that 4 out of people affected by the floods depend upon agriculture for their livelihoods.⁸ With over 998,500⁹ hectares of the croplands in Sindh damaged by the floods, the work opportunities in agricultural labour over the coming months are likely to be diminished. The key analytical question to be answered now is: *What has been the impact of the flood on the supply and demand for agricultural labour?*

⁷ Source: <http://www.fao.org/ag/AGP/AGPC/doc/counprof/pakistan.htm>

⁸ Source: http://www.dailytimes.com.pk/default.asp?page=2010%5C09%5C04%5Cstory_4-9-2010_pg5_5

⁹ Source: FAO, as cited by OCHA. Pakistan Floods: Agricultural Implications, 30 Aug 2010

Seasonal Calendar

Agricultural Commodities & Labour Inputs - The agricultural seasonal calendar is a graphic representation of major factors that impact on *how* and *when* small farmers and agricultural labourers interact with their local environment and market systems. Main categories include: agricultural activities; climate conditions; labour trends; seasonal food and fodder shortages and important cultural /political issues. Key findings from the agricultural seasonal calendar for Sindh include:

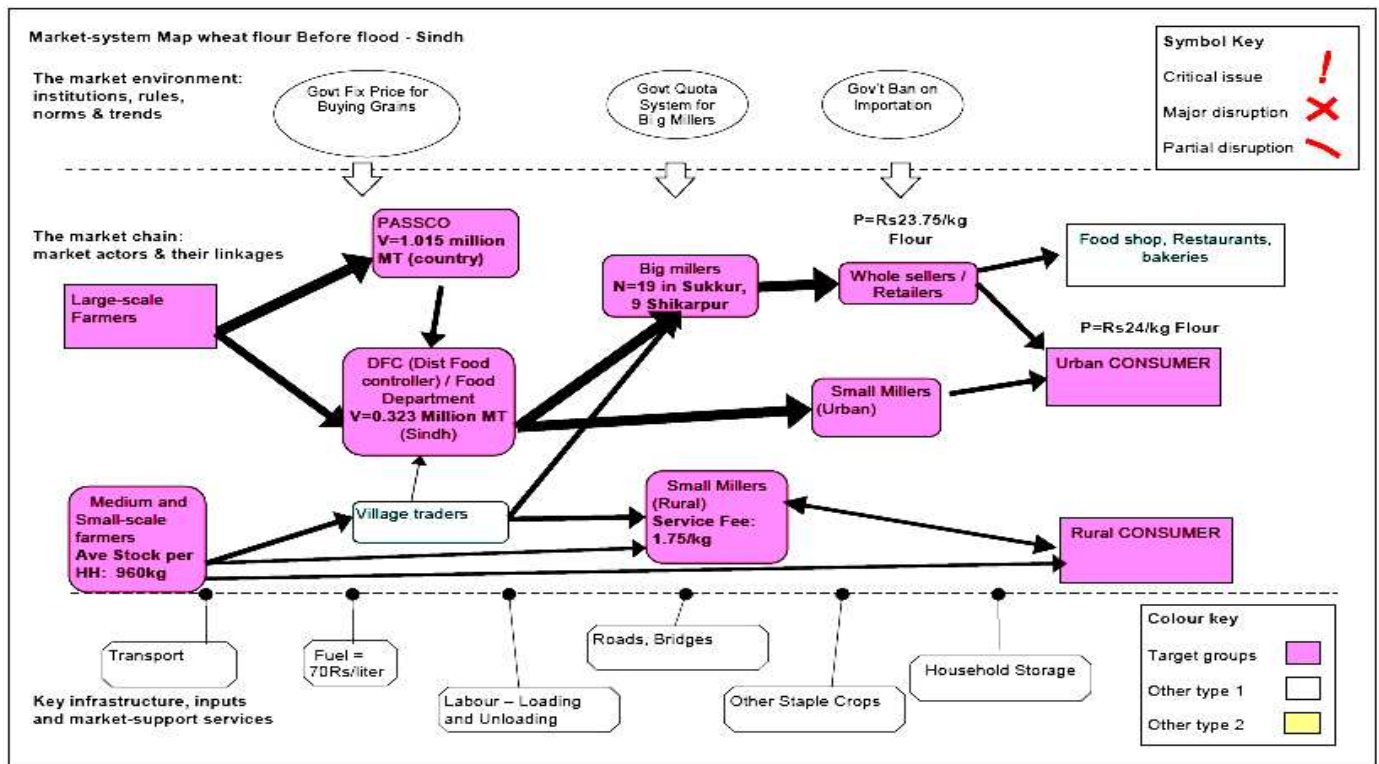
- The extreme flooding of 2010 will make it difficult to adequately prepare the land in time for winter planting of important crops such as wheat and green fodder.
- A “hunger gap” exists just prior to the rice harvest when small farm incomes and food stocks are lowest. This year, the hunger gap coincides with the massive displacement of flood-affected rural people to camps and urban areas.
- A “fodder gap” occurs during the winter months when grazing, crop residues and green fodder crops are at their lowest levels. Flood-related losses of wheat straw and limited opportunities for grazing for displaced livestock owners is likely to contribute to higher fodder prices and lower milk production.
- Labour migration from agricultural to urban or non-agricultural work traditionally takes place in Sindh from January through March. Crop damages and restricted planting opportunities from the extreme flooding of 2010 may accelerate this migration.

Agricultural Seasonal Calendar -Sindh													
Category	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
rainfall					light rainfall						monsoon		
temp					coldest					highest			
wheat		prep	sow					harvest					
rice			harvest						prep	sow			
cotton			harvest							sow			
sugar cane			sow				sow						
		harvest					harvest						
oil seed													
brassica	sow						harvest						
safflower				sow						harvest			
legumes (gram)		sow	harvest										
mustard			sow				harvest						
"hunger gap"													
green fodder													
sorghum								sow				harvest	
berseem	sow		harvest	sow	harvest		sow	harvest					
lucerne	harvest	sow	harvest	sow		harvest	sow	harvest	sow	harvest	sow	harvest	sow
post harvest grazing													
free grazing													
"fodder gap"													
irrigation maint.													
peak ag labour-													
peak other labour													
Ramadan													
school year													

Wheat Seed Market System

Similar to other parts of Pakistan, wheat flour is key food staple in Sindh. In normal times, more than 50% of the daily caloric energy intake comes from wheat. In crisis times, even the poorest groups are reluctant to shift consumption patterns to alternative food sources such as rice. To meet this high demand, national wheat production and wheat imports are highly regulated throughout the year.

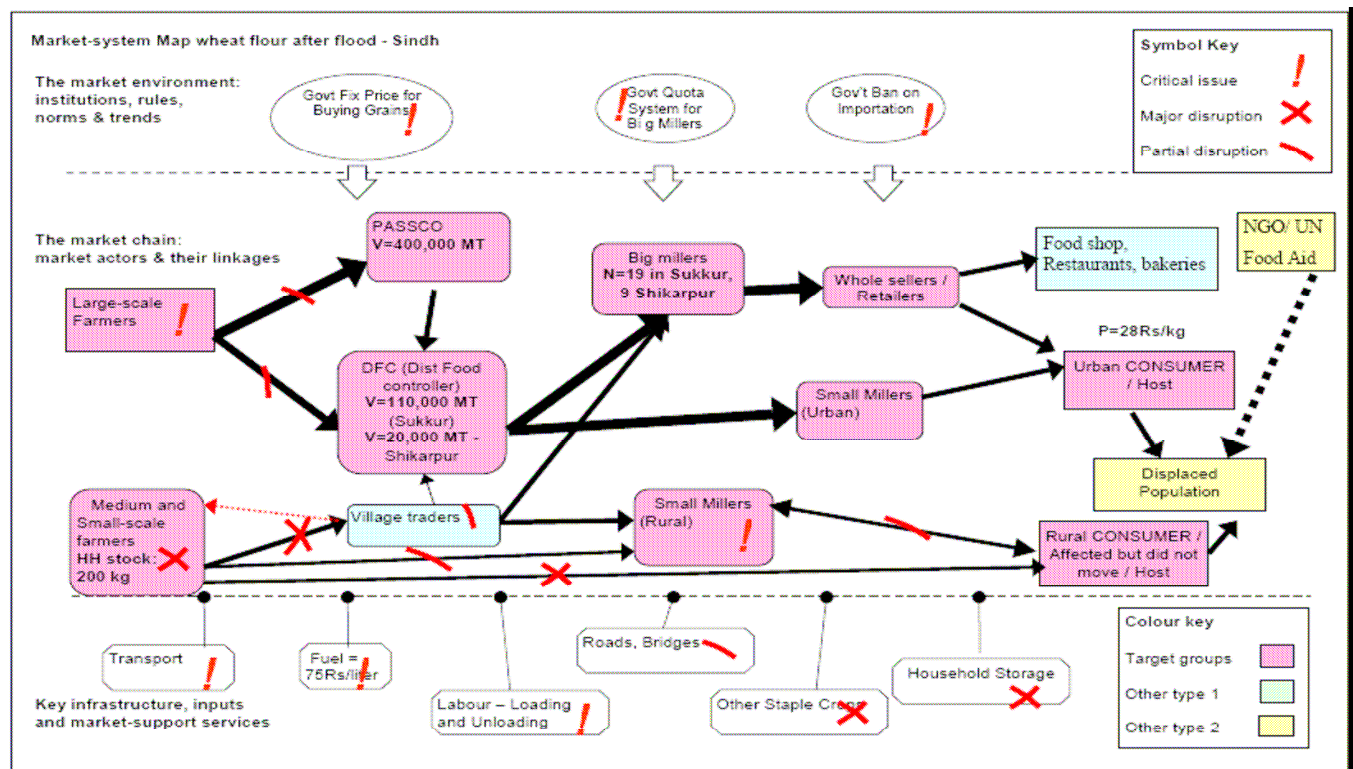
Market System Map - Wheat Flour before the Floods, Sindh



Each year in late September, the federal government sets the price at which, next year's wheat crop will be purchased by government agents of the District Food Controllers. The price for the 2009-2010 wheat grains was PKR 950 per 40 kg. Most of the purchased wheat stocks are held in government storage facilities controlled by the federal Pakistan Agricultural Storage and Services Corporation (PASSCO). Wheat stocks are then released at fixed prices throughout the year to the large flourmills whose sale prices are also set. Prior to Ramadan, the fixed price at the mills was PKR 1000 / 40 kg. In Sukkur City alone, there are 19 large mills. Wholesale traders purchase the wheat flour for regulated sale and distribution to retailers within the province. Inter-province sales are regulated by the Provincial Food Departments.

A parallel market system is in operation for small farmers who typically grow wheat for their personal consumption and as seed stock for *rabi* season planting. On the average, one household (with 7 members) keeps 1000 kg per year in stock. These stocks are usually stored in small grain silos, and sent to local mills for grinding as the need arises. Local mills receive a grinding fee and a small percentage of the flour. While small farmers may also sell their wheat directly to urban retailers, this is generally avoided.

Market system - wheat flour after the floods, Sindh



After the floods, many medium and small-scale farmers have lost significant portions of their stored grain crops – estimated to be as high as 80% in some districts. As the floods did not severely affect the urban centres in these districts, wheat stocks held by the District Food Controllers and PASSCO do not appear to have suffered significant losses.

The majority of the displaced population were not able to save their wheat stock, and are now either buying wheat flour from urban retailers or dependent on the occasional distribution of flour from local governments and NGOs.

Many small flourmills in villages appear to be damaged by the floods as well. For households who managed to salvage their wheat stocks, the loss of these mills means they will have to travel farther and pay higher prices to get flour for personal consumption.

Damages to key infrastructure and support services were primarily to roads, transportation, and wheat storage facilities. As most wheat transactions are on a cash basis, the impact of the floods on credit is unknown, but likely to be related to wheat seed purchases for the upcoming *rabi* season planting.

The most notable change in the institutions and norms that form the enabling market environment appear to be rising fuel prices (set by the government controlled oil and gas refineries).

Key Findings:

- Although exact losses are difficult to ascertain at this time, it is expected that a significant portion of wheat grain stocks of “rural consumers” (predominantly small and medium farmers) have been lost in the floods.
- The loss of stored wheat grain in rural areas will result in an increased demand for wheat flour from urban markets in the coming months.
- Currently, a total of 40,000 MT is available at PASSCO in Sukkur while the District Food Controllers of Sukkur and Shikarpur have stocks of 110,000 MT and 20,000 MT, respectively. While this supply appears adequate to meet the immediate flour demand for the next couple of months, it is not adequate to meet a sustained and increased demand over time.
- A 17% rise in wheat flour price at the retail level has been noted in Sukkur markets (from PKR 240 to PKR 280 per 10 kg). Increases in wheat price at the retail level are likely to continue, adding an additional financial burden to flood affected households.
- Standing floodwaters and flood debris (including silt and sand) on agricultural land will likely cause delays in planting of next year’s wheat crop, as well as lower yields.

Main Recommendations

1. Cash Transfers or Food Vouchers to meet emergency needs of most vulnerable households.
2. Cash for Work for rural livelihood recovery and rehabilitation of agricultural lands, irrigation channels, and roads.
3. District level Food Security Assessments to help inform recovery agenda, and identify potential food insecurity population.

Casual Agricultural Labour Market System

In Sindh, almost 64% of rural families are landless, and work as sharecroppers and agricultural labourers.¹⁰ Known as *haris*, these are some of the poorest rural families who work as bonded labourers. *Haris* are likely to be in debt to local landlords, whose debt may pass on from generation to generation. The debt of the *haris* may also be sold to other landlords, in effect requiring the *haris* to work for others with or without their consent.

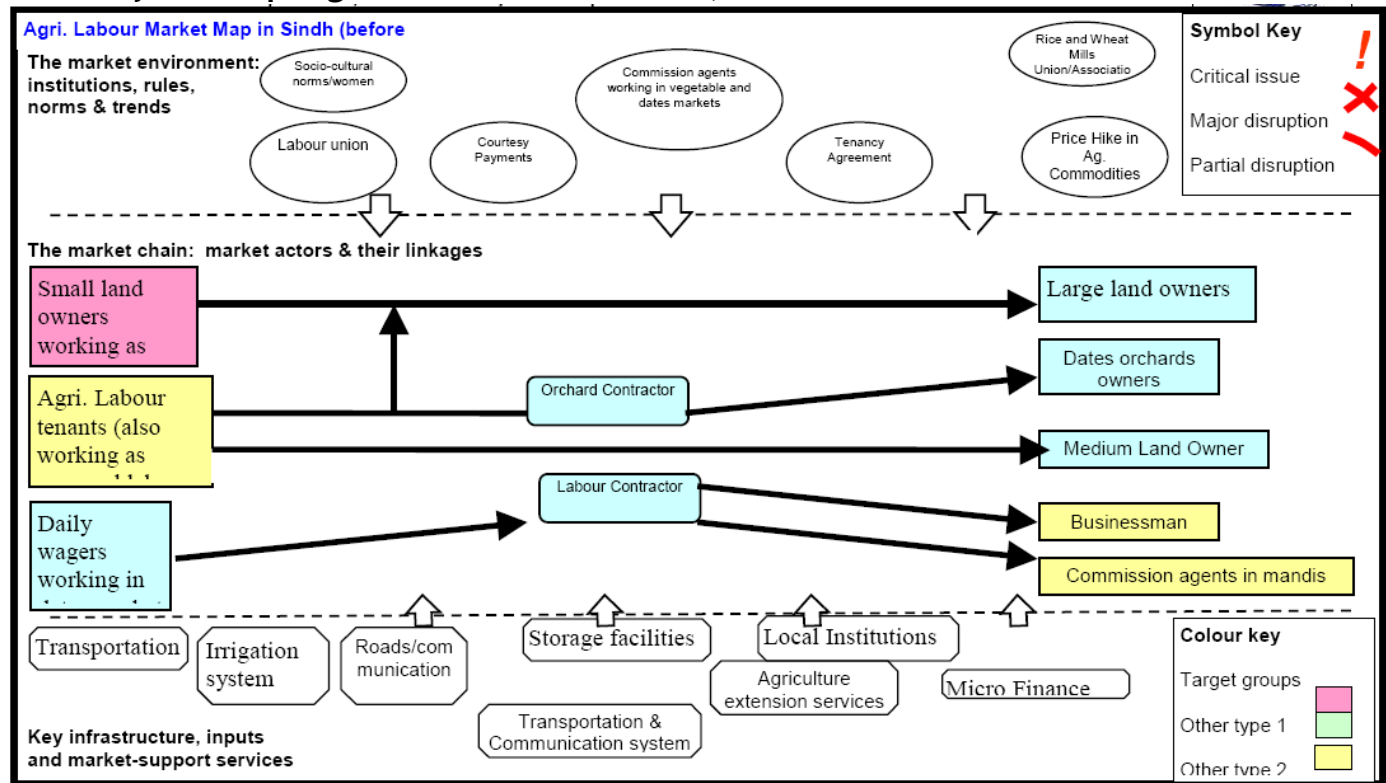
Labour categories in Sindh are roughly divided between skilled and unskilled, and regular and seasonal labour. Year round agricultural tasks such as sowing, applying fertilizer, irrigation, and unskilled labourers working on a regular basis typically conduct livestock feeding. Unskilled labourers, both male and female, are also hired for seasonal tasks such as harvesting. Skilled labour is generally male dominated, and work on a regular basis as tractor or other farm machinery operators.

Agricultural foreman and land managers (known as *kamdars*) are employed on a year round basis as a skilled work source. Most *kamdars* work directly for a single landowner, often in exchange for the land rights and a small salary.

¹⁰ Hussein, M. H., et al, *Bonded labour in Agriculture: A Rapid Assessment in Sindh & Baluchistan 2004* ILO / Geneva

The widespread destruction of standing crops and anticipated difficulties in preparing the land for the upcoming *rabi* planting season suggests that *haris* and other agricultural labourers will soon be facing economic hardships and food insecurity.

Market System Map - Agri-labour before the Floods, Sindh

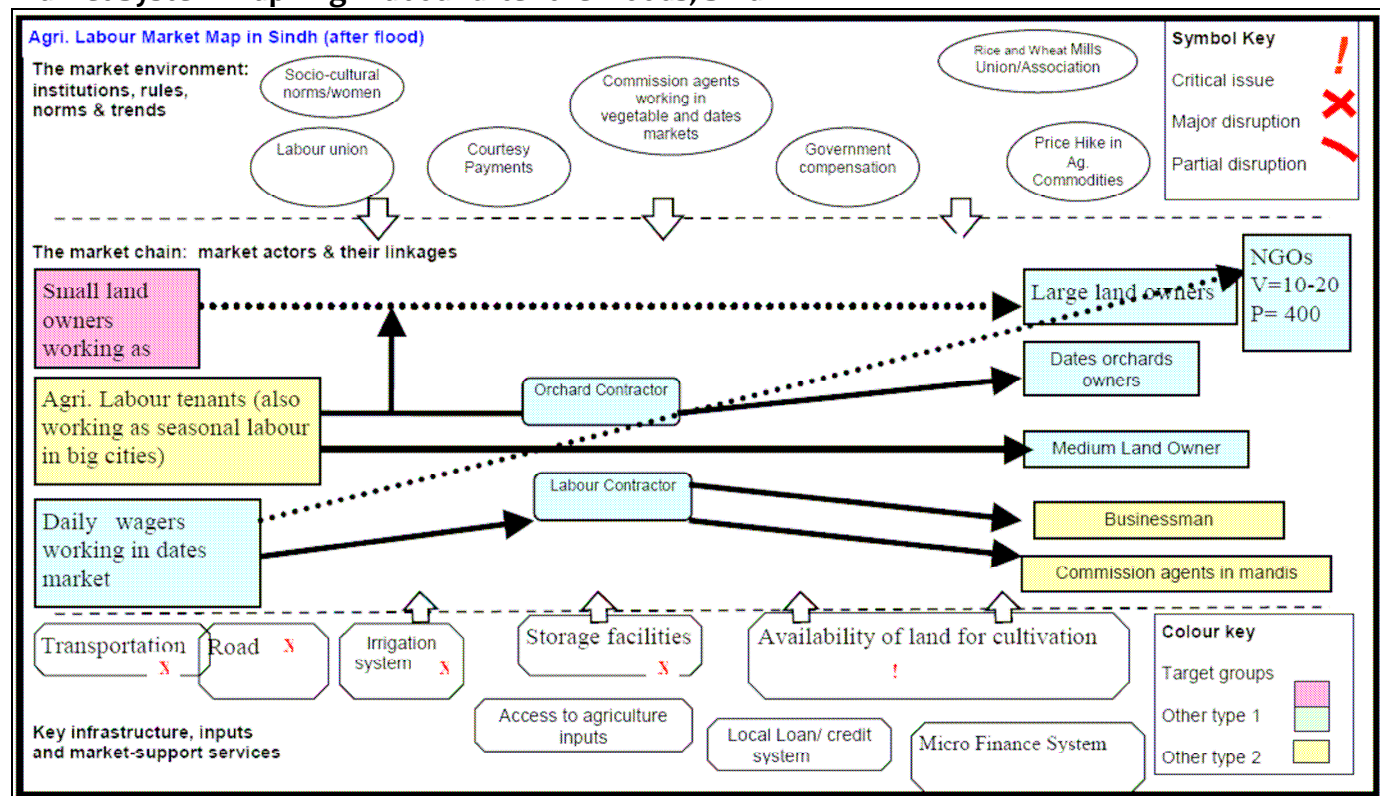


Most rural households relied on agricultural work for income throughout the year, mostly as seasonally employed unskilled labourers involved in land preparation, sowing, fertilizing and harvesting. Gender differentiations in agricultural labour is the norm, although more women and children are seasonally employed in cotton harvesting and date plantations than men. Women typically earn about half of what men do on a daily basis – PKR 125 vs PKR 250. Children earn as little as PKR 75 for cleaning and sorting dates.

Seasonal migration to neighbouring districts for agricultural work is not uncommon. In the date market, contractors hire labourers on behalf of the plantations or production centres. They receive a commission from the plantation owners, and are involved in setting and negotiating wage rates with labour unions, market and mill associations. Most of the seasonal workers involved in harvesting, post harvest production, and loading / unloading trucks are paid on a piece meal basis.

Some seasonal work (primarily sowing and harvesting for small landowners or tenants) is not paid in cash, but rather in-kind or for permission to permit livestock to graze on the post harvested lands. This arrangement is more typical in areas where strong kinship ties are prevalent.

Market System Map - Agri-labour after the Floods, Sindh



After the floods, more than 260,000 acres of cropland in the three districts under review by the EMMA team in Sindh have been, or remain, flooded.¹¹ While clean-up operations are likely to be labour intensive and require large numbers of workers, it is unknown whether landowners of any size will have enough money to pay wages for this work.

Flooding in rural areas has created an influx of labourers to displacement camps and urban areas. As much of the unskilled work currently available is paid on a piece-meal basis, some employers are doubling the number of people they hire to get the job done quicker. Others are reducing their piece meal rates, some by as much as 50%.

The post flood emergency response has introduced a new market actor involved in hiring casual labour, i.e., NGOs. One mill owner complained that NGOs were paying labourers 40% more than the prevailing wage rate for the same work, which could cause localize labour shortages or demands for higher wages that regular employers may not be able or willing to match.

Key Findings

1. Employment opportunities for many agricultural labourers are likely to be reduced in the coming months. While cash for work schemes can help address the shortfall in earnings, support for longer-term land and irrigation rehabilitation projects is also needed.
2. Wage rates, especially for piece meal work, are under threat by the increase in the supply of workers.

¹¹ Government of Sindh, Provincial Disaster Management Authority: *Damages Due to Rain / Floods 2010*.

3. Some landless labourers and indebted workers are expected to be reluctant to return to their rural origins if no income opportunities or shelters / housing is made available. An increase in rural to urban migration rates is a possible consequence.

Main Recommendations

1. Cash Transfers or Food Vouchers to meet emergency needs of most vulnerable households.
2. Cash for Work for rural livelihood recovery and rehabilitation of agricultural lands, irrigation channels, and roads.
3. Cash Grants to support livelihood asset replacement and materials for artisans and skilled crafts people (e.g., carpenters, masons; mechanics).
4. Support for women-focused agricultural opportunities inside and outside of the home (e.g., poultry-raising; livestock re-stocking; kitchen gardens).

Fodder Market System

Livestock is an important component of Pakistan's agricultural markets, contributing 49% to the agriculture GDP. More than 6.5 million households - including more than one million landless rural families - own small ruminants (sheep, goats), cattle and/or buffalo. As cattle and buffalo provide an income stream (milk production, ploughing), food, and a source of fuel, livestock is the main asset for rural Pakistan families living in poverty. There are three main sources of livestock fodder in Sindh: grazing, crop residues, and green fodder crops. While grazing and crop residues comprise 75% of the diet of large livestock, green fodder and hay form 22%. Crop residues and green fodder are routinely sold in rural markets.

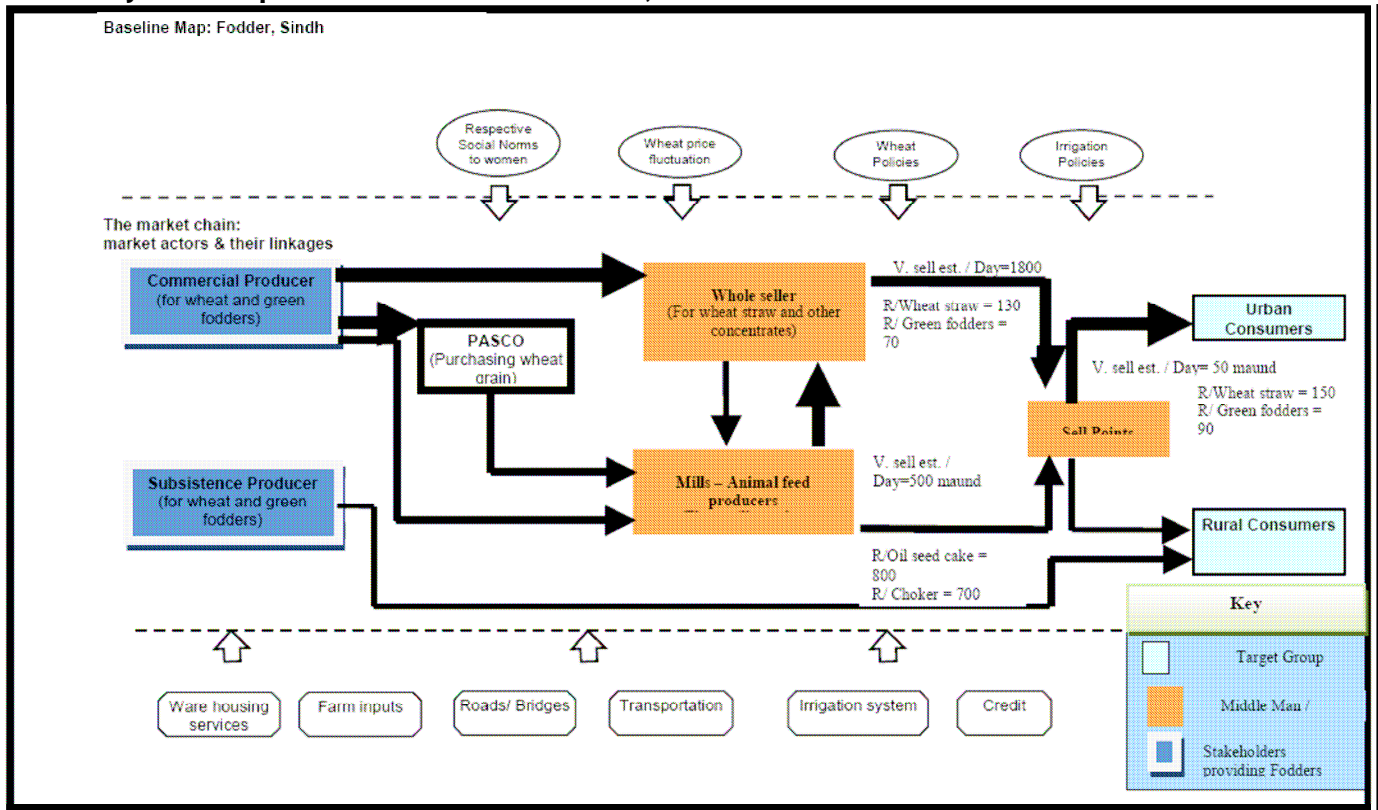
Before the floods, wheat straw and other by-products from the milling process are the predominant fodder commodities sold during the late summer months in Sindh. The Sindh Fodder team found two categories of fodder producers: those who grow wheat and green fodder crops for sale in the market (commercial producers), and those who produce fodder for their own animals or directly for sale to nearby rural livestock households (subsistence producers).¹²

As supplies of wheat straw are reduced during the winter months, a "fodder" gap exists. In part, the leaves and stalks of the sugar cane harvest are used as a substitute fodder crop. Other supplemental feed sources include choker and oilseed cakes. The relative high cost of these feeds, which increases during the fodder gap months, makes them unaffordable for the small-scale livestock owner.¹³

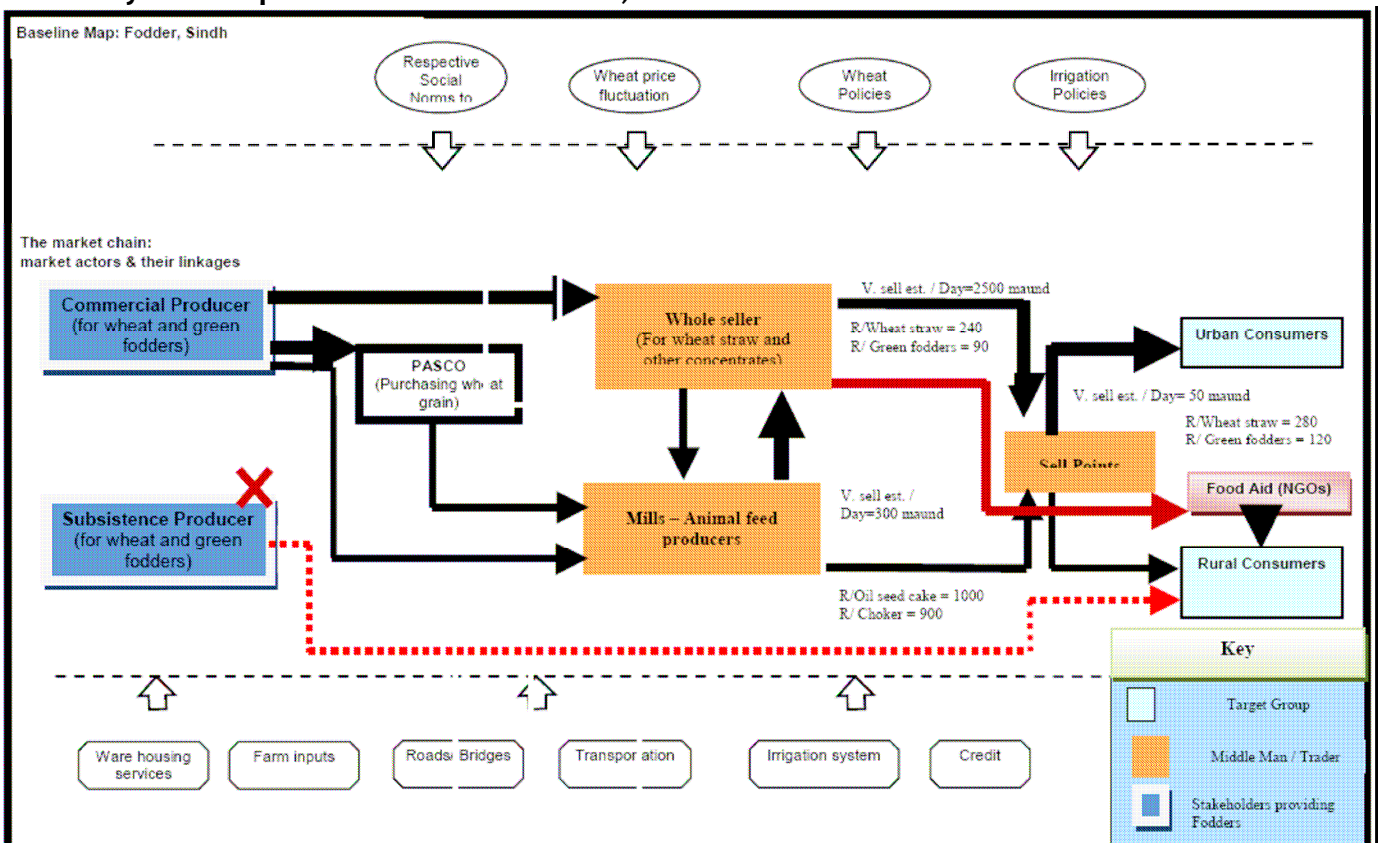
¹² "Urban consumers" refer to markets located in larger towns and cities, who sell primarily to peri-urban and urban livestock households.

¹³ Choker is a mixture of wheat bran, maize, rice husks and hay that is sold directly from mills as a livestock feed. While more nutritious than wheat straw alone, is not widely available or affordable for poor livestock owners.

Market System Map - Fodder before the Floods, Sindh



Market System Map - Fodder after the Floods, Sindh



As many of the rural areas in the districts of Khairpur and Shikarpur remained inaccessible during the fieldwork, exact losses to stored wheat straw and hay fodder are difficult to determine. Anecdotal evidence from displaced farmers and livestock owners suggest that significant losses of stored feed and fodder are likely. Estimates of the losses to the summer fodder crop in Sindh may be as high as 85%.¹⁴

Prices for livestock feed and fodder in Sukkur markets have increased dramatically since the flood: wheat straw has jumped from PKR 150 per 40kg to PKR 275 (increase of 83%); green fodder crops such as sorghum have increased to PKR 120 from a pre-flood price of PKR 80; and feed concentrates like choker and oilseed cakes have risen by 30-35%.

Local governments and NGOs have emerged as new market actors, who buy fodder and feed from area wholesalers and retailers and distribute these items to livestock owners living in displacement camps. Reports suggest that most of these were one time only distributions that took place shortly after displaced people arrived at camps in late August and early September.

Damages to key infrastructure and support services were primarily to roads, transportation, and local storage facilities. As most fodder and feed transactions are on a cash basis, the impact of the floods on credit is likely to be related to green fodder seed purchases for the upcoming *rabi* season planting.

As women and girls are the primary livestock caretakers in rural areas, their ability to perform this function while living in displacement camps in urban areas is restricted.

Key Findings

- Flood damages to standing crops of green fodder and sugar cane (whose leaves and stalks form a significant crop residue for livestock late in the year) are likely to be high, and will exacerbate the annual “fodder gap” that exists in late winter. Losses of stored wheat straw, a low cost fodder material, are also assumed to be significant.
- Although some reports suggest that there were large numbers of flood related livestock losses in Sindh, anecdotal data from interviews with flood-displaced households suggest that their main animal losses were with smaller ruminants and poultry.¹⁵ is not disaggregated by species, the loss of cattle and buffalo belonging to small scale livestock owners is unknown.
- Roughly half of displaced small-scale livestock owners report having to sell one or two animals to meet emergency needs for cash. Small ruminants such as sheep and goats are the animals most likely to be sold; although some milk producing cattle or buffalo are also sold. No livestock-owning household interviewed during this assessment report selling off all of their livestock: on the contrary, many report that they have no intention of doing so.
- Livestock owners who do sell report that they receive 30-50% less than what they would expect to receive. Livestock traders report a very short holding period before re-selling, often less than 2-3 days.

¹⁴ Preliminary Agriculture Damage Assessment Report (Sept – 2010) by FAO / Agriculture Cluster.

¹⁵ The FAO/ Agriculture Cluster reports over 200,000 livestock deaths in Pakistan. However, this is not disaggregated by species.

Main Recommendations

- 1) Cash Transfers or Vouchers to small-scale livestock owners / vulnerable households to purchase fodder or feed concentrates and other agricultural inputs.
- 2) Institutional Support for veterinary services and lady livestock organizations for outreach and educational work, focusing on promoting higher milk yields
- 3) Distribution of green fodder seeds and fertilizers for rabi season planting, focusing on crop lands that are rehabilitated too late to permit wheat planting.

Bamboo and Timber Pole Market Systems

Over 1.1 million homes were destroyed or damaged by the monsoon floods in Sindh, more than all the other flood affected provinces combined. To date, less than 6% of flood affected or displaced households have received emergency shelter assistance.¹⁶ The need for basic emergency shelter materials such as plastic sheeting / tarpaulins, rope, and bamboo or timber poles is high, and questions about the capacity of local markets to meet this demand are frequently asked. From the 15-25 September 2010, a market assessment team looked at the impact of the floods on the production, sale and use of these materials in three districts of Sindh: Khairpur, Shikarpur, and Sukkur.

Bamboo

There are three main species of bamboo grown in Pakistan for construction purposes: *Dandrocalamus Strictus*, *Bambusa Tula*, and *Dandrocalmus Hamiltonii*. In addition to its use for construction purposes, bamboo is also used for the paper pulp industries.¹⁷

Before the floods, almost 100% of bamboo cultivation in Pakistan comes from private farms in Punjab, the majority of which is grown on plots of less than 0.5 acres. There are a small number of larger bamboo plantations of 4-6 acres in area. All locally available supplies of bamboo in Sindh come from these private farms / plantations in Punjab. Bamboo grown on a two year cycle is typically used for the paper pulp industry, while bamboo grown for 3-4 years is used as structural support for dikes / bunds along irrigation canals, and other construction purposes. Data on the amount of bamboo sold for export (primarily to Middle East countries) is not readily available.

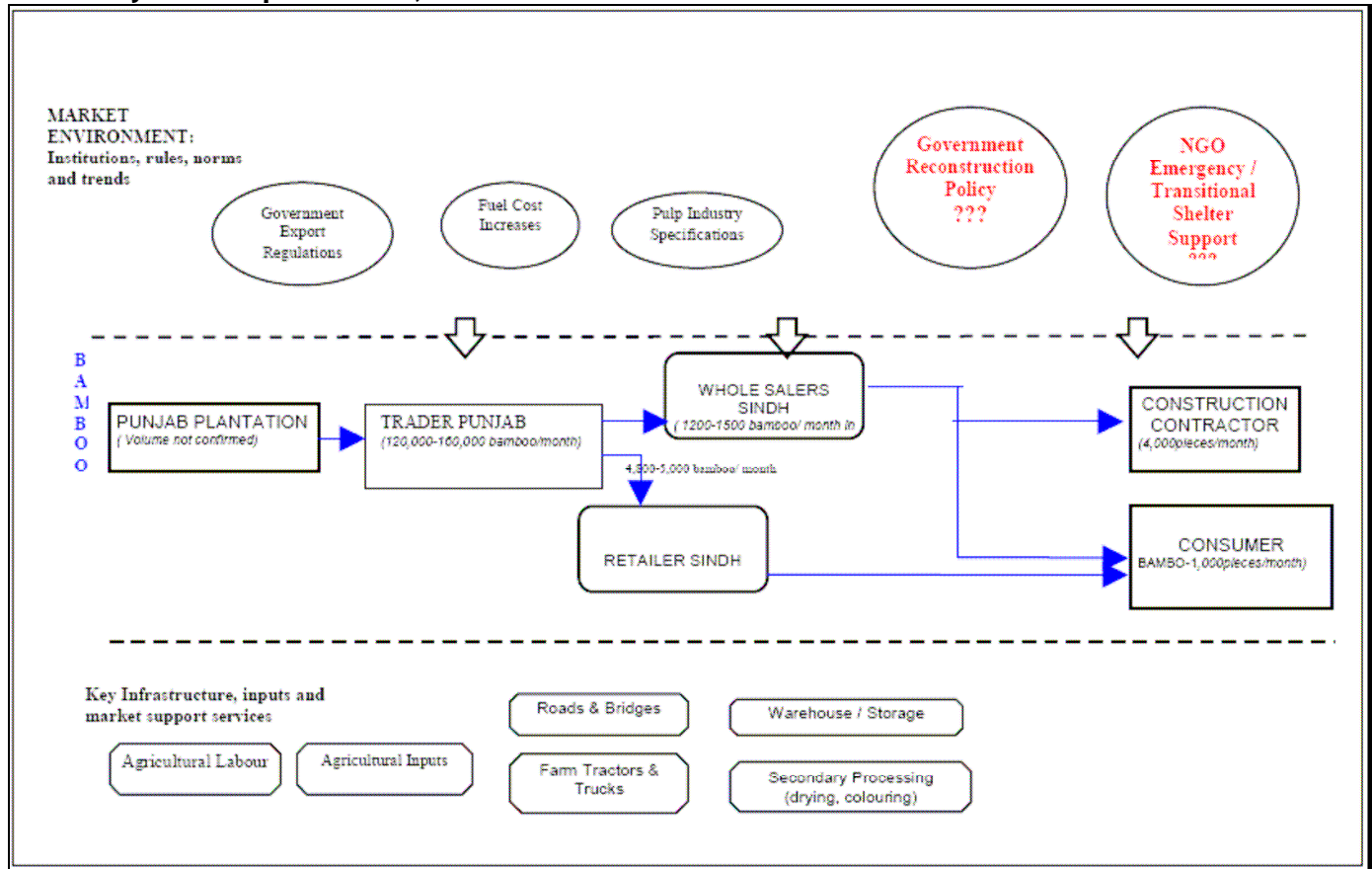
Most bamboo farmers sell to traders, who clear-cut the cultivated bamboo, arrange transportation, and sell it to wholesalers, larger retailers, or paper pulp factories. As bamboo is harvested year round, there is little seasonal variation in prices or supply. Annually, bamboo prices tend to increase by 5% every two years (wholesale level).¹⁸

¹⁶ Source: https://sites.google.com/site/shelterpak2010/file/101001_ShelterNFI_Summary.xls?attredirects=0

¹⁷ Common construction uses include: lightweight shelters; scaffolds/ladders; and retaining walls for dikes and canals.

¹⁸ Source: interviews with three bamboo retailers in Sukkur, 18 September 2010.

Market System Map - Bamboo, Sindh



Although large areas of Punjab were flooded, there are no reports of significant bamboo crop losses. Most of the disruption to the bamboo market is related to flood related damages to transport infrastructure (primarily roads and bridges).

Despite the huge need for emergency shelter materials, wholesalers and retailers in the three districts in Sindh under review report no significant increase in demand for bamboo. Although much of the increased demand for bamboo is expected to come from NGOs, these new consumers have yet to show themselves in the market chains. From interviews with NGOs and the IASC Shelter Cluster, it suggests that there are three possible explanations for their absence in the market chain:

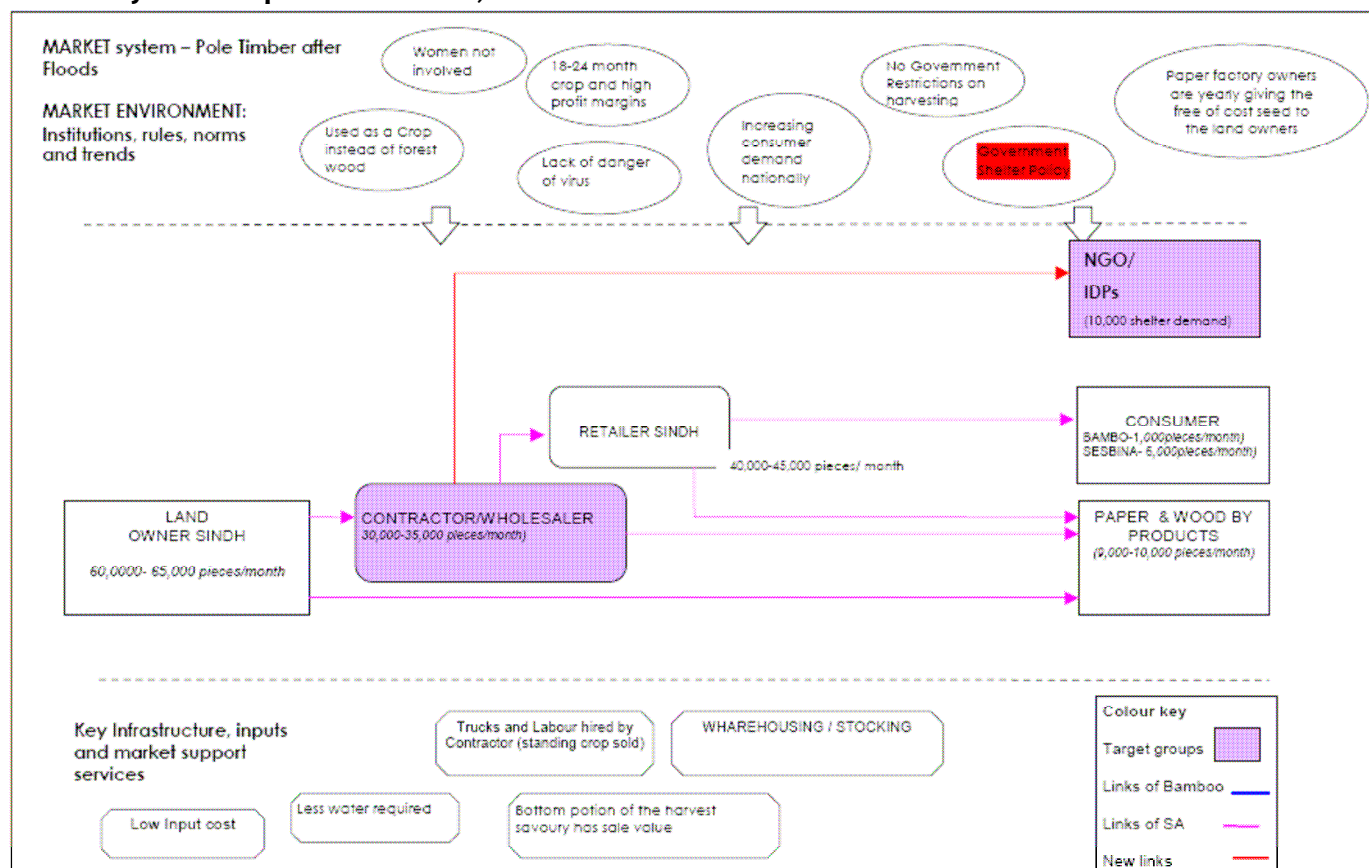
- the small number of international NGOs currently in Sindh who plan to offer emergency shelter support as part of their relief efforts;
- the lack of secured funding from donors for emergency shelter support;
- Islamabad-based (vs local) procurement for these materials.

NGOs who have purchased bamboo in Sindh report that they are paying approximately PKR 70 – 80 per 8 foot lengths. Wholesalers and retailers in Sindh report less than 10% increase in bamboo prices since the flood, which they attribute to increased transportation costs. Higher bamboo prices have been noted by NGOs in Islamabad, ranging from PKR 90 – 130 for 8 ft lengths. As the majority of bamboo comes from Punjab plantations, it is assumed that the difference in price between Sindh and Islamabad is related to distribution charges and differing profit margins.

Timber Poles

While poplar (*Populus euphratica*) and acacia (*Acacia nilotica*) timber poles are commonly used as frames for lightweight shelters, *Sesbania aculeata* is widely available and also used for shelter construction in Sindh. Known locally as *manjhandari*, this multiple use woody shrub is valued as a nitrogen fixing plant, whose side shoots and branches are cut to promote the growth of the central pole. While *manjhandari* poles are sold as shelter materials and as raw material for the paper pulp industry, the branches are commonly used for fuel wood and the leaves as animal fodder.

Market System Map – Timber Pole, Sindh



Before the floods, *manjhandari* is grown as a standalone or intercrop species in small farms throughout Sindh. In northern Sindh, the average size of the *manjhandari* plot is 2-3 acres. In addition to its use for walls and roofs in lightweight shelter construction, *manjhandari* is also grown as a raw material for the paper pulp industry. To encourage production, some paper pulp factories distribute *manjhandari* seeds to farmers free of charge.

In 18 months, the central shoot of *manjhandari* reaches 5-6 cm in diameter and 20 feet in height. It is harvested by clear-cutting every two years or, either by labour hired directly by the landowners or by traders who arrange harvesting and transport. Around 40-50 farmers in Northern Sindh grow *manjhandari* as a cash crop, with an approximate production capacity of 2000-3000 (20 ft) poles per month.

Similar to the bamboo market, the primary impact of the flood on the *manjhandari* market was a temporary disruption to the transportation network. No producer, trader, or wholesaler identified losses or potential supply problems of these materials in the coming months.

To date, no price increase at the wholesale or retail level has been noted. The average price for a 6-7 cm width *manjhandari* pole is PKR 70, or about 50% of the price of a similar dimension bamboo pole.

Key Findings

- The existing supplies of bamboo & timber poles are NOT adequate to meet the huge need for emergency or transitional shelters in Sindh. However, due to the small number of operational shelter agencies in Sindh, the available amount of bamboo and timber poles in regional markets is likely to meet a short-term demand (3-4 months).
- The ready availability, low cost, and fibrous composition of *manjhandari* poles presents an alternative to bamboo for supporting tents, plastic sheeting, or as roof frame for lightweight materials (palm thatch). As *manjhandari* has limited compressive and tensile strength, it is less suitable for high load bearing applications such as wall framing. *Manjhandari* can also be used as the woven lattice (wattle) over which clay, sand, animal dung and straw is applied to form earthen walls, or as horizontal reinforcement for *kutchha*-style houses.
- By the beginning of the year, however, the ability of the bamboo and *manjhandari* market to meet the increased shelter demand will depend upon two main variables: the capacity of NGOs to scale up their emergency / transitional shelter support operations; and clarity about the proposed government reconstruction policy, especially in defining what types of construction materials will be recommended.
- A shift in demand from bamboo and timber pole framed shelters to masonry houses is likely to occur during the first quarter of 2010. This will help reserve existing supplies of bamboo and timber poles for use as low cost roof framing materials, to which there are few alternatives.¹⁹

Main Recommendations

- 1) Encourage regional procurement of bamboo / timber poles for emergency and transitional shelter construction for the next three months.
- 2) Discourage use of bamboo / timber poles for wall construction after 3 months to avoid depleting stockpiles.
- 3) Further research on fired brick market systems produced in local / regional kilns to help identify opportunities to support increased production.
- 4) A technical working group should be set up within the Emergency Shelter Cluster to provide guidance on vernacular building materials for disaster resistant housing.

¹⁹ While precast concrete beams or lightweight steel can be used for roof framing, these materials are not readily available at affordable prices in rural areas.

Recommendations – all markets

Response Recommendations for Wheat Flour	Advantages & Positive Market impacts	Disadvantages & Risks/Assumptions	Timing & Feasibility
Cash Transfers or Food Vouchers to meet emergency needs of most vulnerable households.	<ul style="list-style-type: none"> Increased purchasing power. Supports local market chains. Reduces short term food insecurity. 	<ul style="list-style-type: none"> Widespread poverty may make targeting difficult. Social /political risks associated with targeting. Vendor acceptability of vouchers in lieu of cash payments. 	<ul style="list-style-type: none"> Quick, short term response. Highly feasible.
Cash for Work for rural livelihood recovery and rehabilitation of agricultural lands, irrigation channels, and roads.	<ul style="list-style-type: none"> Increased purchasing power. Facilitates rehabilitation work & agricultural recovery. Supports government efforts to facilitate return to rural origins. 	<ul style="list-style-type: none"> Land tenure issues may make it difficult to ensure that landless people can receive long term benefits of rehab works. High level of supervision & monitoring required. May be difficult to implement through local partners. Balance between household vs communal recovery priorities. 	<ul style="list-style-type: none"> Medium term response (< 4 months). Moderately feasible.
District level Food Security Assessments to help inform recovery agenda, and identify potential food insecurity population.	<ul style="list-style-type: none"> Helps fill assessment gaps. Identifies highly vulnerable districts. Enables bespoke interventions of a direct or indirect nature. 	<ul style="list-style-type: none"> Time needed for detailed assessments. Requires frequent monitoring. Risk of increasing dependency. 	<ul style="list-style-type: none"> Medium term response (< 4 months). Moderately feasible.

Response Recommendations for Fodder	Advantages & Positive Market impacts	Disadvantages & Risks/Assumptions	Timing & Feasibility
Cash Transfers or Vouchers to small scale livestock owners / vulnerable households to purchase fodder or feed concentrates and other agricultural inputs.	<ul style="list-style-type: none"> Facilitates choice; encourages local expertise. Supports local market chains. Reduces negative impact of fodder gap. 	<ul style="list-style-type: none"> Widespread poverty may make targeting difficult. Social /political risks associated with targeting. Vendor acceptability of vouchers in lieu of cash payments. Might discourage return to rural areas. 	<ul style="list-style-type: none"> Quick, short term response (< 2 months). Highly feasible.
Institutional Support for veterinary services and lady livestock organizations for outreach and educational work, focusing on promoting higher milk yields	<ul style="list-style-type: none"> Facilitates agricultural recovery. Supports partnerships with local organizations. Encourages shift of focus from asset protection to increased income. 	<ul style="list-style-type: none"> Capacity of local organizations to meet donor / partner requirements. Measuring of impact likely to extend past emergency period. 	<ul style="list-style-type: none"> Medium to long term response (< 12 months). Highly feasible.

Distribution of green fodder seeds and fertilizers for <i>rabi</i> season planting, focusing on crop lands that are rehabilitated too late to permit wheat planting.	<ul style="list-style-type: none"> Facilitates agricultural recovery. Reduces negative impact of fodder gap. Encourages production of nutritious feed. Increases farm incomes. 	<ul style="list-style-type: none"> May undermine local markets if seed/fertilizers are purchased from elsewhere. May require irrigation for high yields. Does not address need for roughage in livestock diet. May encourage dependency. 	<ul style="list-style-type: none"> Medium term response (< 6 months). Moderately feasible.
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Response Recommendations Agricultural Labour	Advantages & Positive Market impacts	Disadvantages & Risks/Assumptions	Timing & Feasibility
Cash Transfers or Food Vouchers to meet emergency needs of most vulnerable households.	<ul style="list-style-type: none"> Increased purchasing power. Supports local market chains. Reduces short term food insecurity. 	<ul style="list-style-type: none"> Widespread poverty may make targeting difficult. Social /political risks associated with targeting. Vendor acceptability of vouchers in lieu of cash payments. 	<ul style="list-style-type: none"> Quick, short term response. Highly feasible.
Cash for Work for rural livelihood recovery and rehabilitation of agricultural lands, irrigation channels, and roads.	<ul style="list-style-type: none"> Increased purchasing power. Facilitates rehabilitation work & agricultural recovery. Supports government efforts to facilitate return to rural origins. 	<ul style="list-style-type: none"> Land tenure issues may make it difficult to ensure that landless people can receive long term benefits of rehab works. High level of supervision & monitoring required. May be difficult to implement through local partners. Balance between household vs. communal recovery priorities. 	<ul style="list-style-type: none"> Medium term response (< 4 months). Moderately feasible.
Cash Grants to support livelihood asset replacement and materials for artisans and skilled crafts people (e.g., carpenters, masons; mechanics).	<ul style="list-style-type: none"> Facilitates rehabilitation and repair of housing and machinery. Provides additional unskilled labour opportunities. Supports government efforts to facilitate return to rural origins. 	<ul style="list-style-type: none"> Social /political risks associated with targeting. Requires more detailed market assessment to determine supply and demand constraints. Measuring of impact likely to extend past emergency period. 	<ul style="list-style-type: none"> Medium term response (< 6 months). Moderately feasible.
Support for women-focused agricultural opportunities inside and outside of the home (e.g., poultry-raising; livestock re-stocking; kitchen gardens).	<ul style="list-style-type: none"> Provides food and income streams to women. Helps support local markets. 	<ul style="list-style-type: none"> Social /political risks associated with targeting. Assumes that land tenure and housing access is available. Measuring of impact likely to extend past emergency period. 	<ul style="list-style-type: none"> Medium term response (< 6 months). Moderately feasible.

Response Recommendations for Bamboo and Timber Pole	Advantages & Positive Market impacts	Disadvantages & Risks/Assumptions	Timing & Feasibility
Encourage regional procurement of bamboo / timber poles for emergency and transitional shelter construction for the next three months.	<ul style="list-style-type: none"> Helps balance demand and supply. Supports local market chains. Contributes to a more rapid shelter response. 	<ul style="list-style-type: none"> Reduction in quality of materials over time. May encourage illegal harvesting. 	<ul style="list-style-type: none"> Quick, short term response. Highly feasible.

Discourage use of bamboo / timber poles for wall construction after 3 months to avoid depleting stockpiles.	<ul style="list-style-type: none"> • Supports local market chains. • Helps regulate supply shortages. • Encourages use of more durable shelter materials (i.e. bricks). 	<ul style="list-style-type: none"> • Reduction in quality of materials over time. • Potential delays in procuring alternative material. 	<ul style="list-style-type: none"> • Medium term response (< 4 months). • Moderately feasible.
Further research on fired brick market systems produced in local / regional kilns to help identify opportunities to support increased production.	<ul style="list-style-type: none"> • Supports local markets. • Fills in assessment gaps. • Encourages inter-agency collaboration • Encourages use of more durable materials. • Increased employment opportunities. 	<ul style="list-style-type: none"> • Resource mobilization for new assessment may be challenging. • Possible negative social and environmental impacts of increased brick production. 	<ul style="list-style-type: none"> • Short term assessment, longer term response (> 9 months). • Moderately feasible.
A technical working group should be set up within the Emergency Shelter Cluster to provide guidance on vernacular building materials for disaster resistant housing.	<ul style="list-style-type: none"> • Encourages interagency coordination. • Visible cluster output. 	<ul style="list-style-type: none"> • Collaborative technical projects are time consuming. • Specialist technical support may be required. 	<ul style="list-style-type: none"> • Medium term response (< 9 months). • Moderately feasible.