

OPINION ON SHORTAGE OF WHEAT STRAW IN THE MARKET



**COMPETITION COMMISSION OF PAKISTAN
GOVERNMENT OF PAKISTAN**

The Competition Commission of Pakistan (**the ‘Commission’**) is mandated under the Competition Act, 2010 (**the ‘Act’**) to provide for free competition in all spheres of commercial and economic activity to enhance economic efficiency and to protect consumers from anti-competitive behavior.

Under Section 29 (c) of the Act, the Commission is empowered to hold open hearings on any matter affecting the state of competition in Pakistan or affecting the country’s commercial activities and expressing an opinion with respect to the issues.

The Commission after receiving number of concerns relating to the shortage of wheat straw in the market conducted an open hearing on November 07, 2019 in Lahore. The open hearing was attended by various stakeholders relating to industries such as paper manufacturing, livestock, dairy milk, and fertilizers.

This Opinion will provide a detailed insight into the issues raised by different stakeholders and the recommendation proposed by the Commission thereon.

BACKGROUND

- 1- The Commission is in receipt of submissions on behalf of the Pakistan Pulp Paper & Board Mills Association ('PPBM') and Farmers' Association dated 29th May, 2019 regarding an acute shortage of wheat straw and its resultant increased price in the market.
- 2- Wheat straw is a by-product of wheat and has the following uses:
 - a. It is the main raw material in the production of pulp and paper and constitutes approximately 85% (eighty five percent) of total cost of low quality paper.
 - b. It is used by the livestock and dairy industry as an essential component of fodder for cattle.
 - c. It is also increasingly being used as an alternate source of fuel for power generation. Concerns are expressed over the use of wheat straw as an alternate fuel since it deprives the pulp paper and livestock sector of an essential input.
- 3- It is alleged that at present the parties are facing a shortage of wheat straw as it is either priced at a very high rate or is simply not available in the market. PPBM alleges that this shortage has been deliberately created in order to bid up prices, compelling many paper manufacturing units to either shut their operations or to operate at below capacity. The Farmers' Association has claimed that certain players having excessive cash flows have established centers all over Punjab for procurement of wheat straw resulting in shortage or excessive prices for farmers which is adversely impacting meat and milk prices.

PARTIES

- 4- The parties which participated in the open hearing:
 - a. PPBM
 - b. Farmers' Association (Dairy & livestock farmers)
 - c. Pakistan Agricultural Coalition
 - d. Bio energy consultant (Haq Consultants)
 - e. Members of the general public.

SUBMISSION OF PARTIES

5- **PPBM** --The following submissions were made by PPBM:

- a. As per estimates, 50% (fifty percent) of wheat straw is used for animal consumption and remaining 40% (forty percent) is used by other sectors which includes exports. Out of this 40 % (forty percent) nearly 5% (five percent) is used by the pulp and paper industry. Good quality or virgin paper is made from wood pulp and since Pakistan does not have sufficient forests, wood pulp is being imported. Another method of manufacturing paper, albeit of lower quality, is to use wheat straw which is considered as a good and sustainable raw material. For the indigenous paper industry, wheat straw constitutes 85% (eighty five percent) of its raw material which is mainly used by the education sector of Pakistan for notebooks and writing pads etc.
- b. A large market player primarily uses imported wood pulp and only 10% (ten percent) of wheat straw as raw material for the production of high quality paper.
- c. With respect to the amount of wheat straw produced locally PPBM challenged the crop to residue ratio figure of 1.5:1 submitted to the Commission (which translated into production of 37.5 million tons of wheat straw). According to PPBM, this ratio was 1:1.5 instead amounting to annual production of 16.79 million tons.
- d. The last three years have witnessed a jump in the price of wheat straw from PKR 250 per ton to PKR 480 per ton and can even hover around PKR 1000 per ton out of season. During the hearing, few small livestock farmers claimed that since they were not purchasing in bulk, like the paper mills, they had to pay around PKR 650 to PKR 680 per ton. Due to its unavailability and high prices Pulp & paper mills either faced closure or were forced to increase the price of paper. A pulp-paper mill owner cited news reports indicating that the price of paper had increased from PKR 80 per kg to PKR 120 per kg.
- e. PPBM informed that a certain large player had procured 1.5 million tons wheat straw burning most of it in its biomass boiler. It was also stated that the installation of another boiler was in pipeline for the same. As biomass, wheat straw is half the cost of fuel however, unlike the paper & livestock industries there were many other alternate sources of bio fuel available in the market. It was also reported that a large market player had hoarded stock for a whole year

in 13 centers all over Punjab and requested the Commission to go and inspect these sites to ascertain this.

- f. The impression created that the shortage of wheat straw was due to its transportation to KPK was misplaced as the cost of such an exercise was so high as to render the exercise unfeasible.
- g. As per submissions, over 50% (fifty percent) of wheat straw is utilized as animal fodder, approximately 5% (five percent) by the pulp and paper industry and over 10% (ten percent) for burning as bio fuel. The sector wise utilization is tabulated as follows:

Table 1: Wheat Straw Utilization	
Animal Fodder	>50%
Pulp and Paper Industry	<5%
Domestic Use	<2%
Export	<5%
As fuel	>10%

Source: PPBM

6- **Bio Energy Consultant:** A bio energy consultant namely Haq Consultants present in the hearing submitted that:

- a. A study was conducted by the Govt. of Punjab and its findings indicated that wheat straw was not feasible for bio energy due to its high cost. On a question from the Bench regarding alternate sources of bio energy, it was informed that there were a number of such readily available sources with a similar energy content as wheat straw which are:

Table 2: Energy Content	
Crop Residue	Energy Content Megajoules/kg
Rice Straw	13.0
Sugar trash	15.0
Wheat Straw	14.4
Bagasse	12.8
Maize Stalk	14.9

- b. He noted that the big market player was mainly using maize in its boiler and used wheat straw only in some periods for bridging. He suggested that a possible solution to the wheat straw shortage was to ban its burning as biomass.

7- **Dairy and Livestock farmers**—The following submissions were made:

- a. Due to the high cost and unavailability of wheat straw farmers were only feeding cattle enough fodder for their survival. Since price of wheat straw, which is a

primary source of cattle fodder, had substantially increased it was simply not feasible for dairy farmers to sell milk at PKR 100 per liter and if prices continued to rise they would be forced to raise prices up to PKR 200 per liter.

- b. On An inquiry from the Bench regarding the procurement of wheat straw, it was informed that wheat straw is sold by large landowners who have a surplus for sale. Farmers with small landholdings did not generate surplus for sale. Some wheat straw is wasted during harvesting (which could be avoided by using certain types of attachments with the harvesters).
- c. A suggestion was made regarding possibility of changing the existing environmental protection laws to ban the burning of wheat straw since there was a similar law in Punjab for brick kilns.

ISSUE

- 8- The burning of wheat straw for alternate fuel has caused an acute shortage and driven up prices for this commodity adversely affecting prices meat and dairy products and survival of pulp and paper industry.

ANALYSIS

Significance of Wheat Straw

- 9- Wheat straw is the residue generated during the harvesting of wheat and therefore, its production is directly correlated to annual production of wheat. A report by the World Bank suggests that the crop to residue ratio for wheat in Pakistan is 1:1 which means that every ton of wheat generates 1 ton of wheat straw. Based on this estimate the annual wheat straw production over a three year period is as follows:

Table 3: Wheat & Wheat Straw Production		
Year	Wheat	Wheat Straw
2016-17	26.67	26.67
2017-18	25.07	25.07
2018-19	25.19	25.19

Source: *Wheat Production from Economic Survey of Pakistan 2018-19*

As the table above shows wheat production (and by default wheat straw figures) have remained relatively stable, hovering around an average of 25.6 million tons however, prices of wheat straw have risen from PKR 336 per 40 kg last year to PKR 480 per 40

kg¹ in the current year translating into an increase of 34% (thirty four percent) which would lead one to intuitively observe that this rise in prices has been due to a rise in demand for this commodity. Like wheat, procurement of wheat straw takes place during the harvest season i.e. April to May therefore, prices generally tend to peak in the period preceding the new harvest.

10- Competition theory suggests that firms must not be denied access to an essential input, and an input is deemed to be essential, if no other feasible substitutes to it are readily available. We now proceed to examine whether wheat straw is an essential input for the livestock sector, pulp & paper industry and as a source of bio energy.

As fodder for Livestock Sector

11- Pakistan is an agrarian country. According to Economic Survey of Pakistan 2018-19, the agriculture sector contributes 18.5% (eighteen point five percent) to the GDP of the country and employs 38.5% (thirty eight point five percent) of the national labor force. The livestock sector's contribution to agriculture is 60.5% (sixty point five percent) and 11.2% (eleven point two percent) to the GDP of the country. Over the years the livestock sector has outperformed the crop subsector. Moreover, the livestock subsector also holds a significant position in the foreign exchange earnings by contributing 3.1% (three point one percent) to the total exports. It may also be worth mentioning that it is a source of 35-40% (thirty five to forty percent) of the income of over 8 million rural families.

12- As per the Economic Survey of Pakistan, the estimated livestock population is 202 million whereas meat production accounts for 4.5 million tons. The estimated milk production and its human consumption is 59 million tons and 48 million tons respectively. This clearly shows the significance of livestock and its products in our daily lives.

13- The feeding practice in the livestock sector is mainly of two types:
a. Rural Households; where animals are fed grown on crop residues

¹ Submissions by PPBM. As per an independent verification by the Commission from statistics available on AMIS.pk, Government of Punjab, and the price of wheat straw has increased from PKR 250 PER 40 kg to PKR 480 per 40 kg.

b. Intensive and Semi-intensive dairy farming around urban markets; where animals are fed crop residues and agro-industrial by-products.

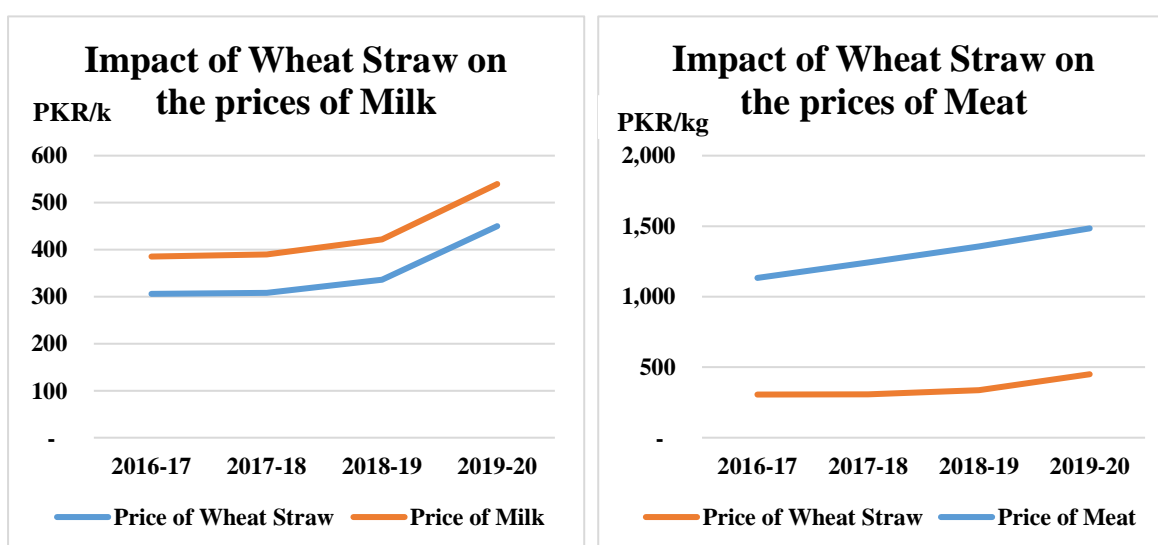
14- The contributions of different feed sources for animals in Pakistan are elucidated as under:

Source	Contribution
Crop Residues	51%
Forage/Grazing	38%
Cereal by-products	06%
Post-harvest grazing	03%
Oil cakes, meals, animal protein	02%

Source: Food and Agriculture Organization (FAO) of the United Nations, Dairy Development in Pakistan, 2011

15- The table clearly shows that more than half of the animal dietary needs are fulfilled by crop residues, one-third from grazing, and the rest from other crops and their by-products. In our local dairy sheds, the animal fodder mainly comprises of wheat straw which has immense nutritional value for the cattle and has no close substitutes with regards to the same. Therefore, we can say that wheat straw forms an essential input for the livestock sector.

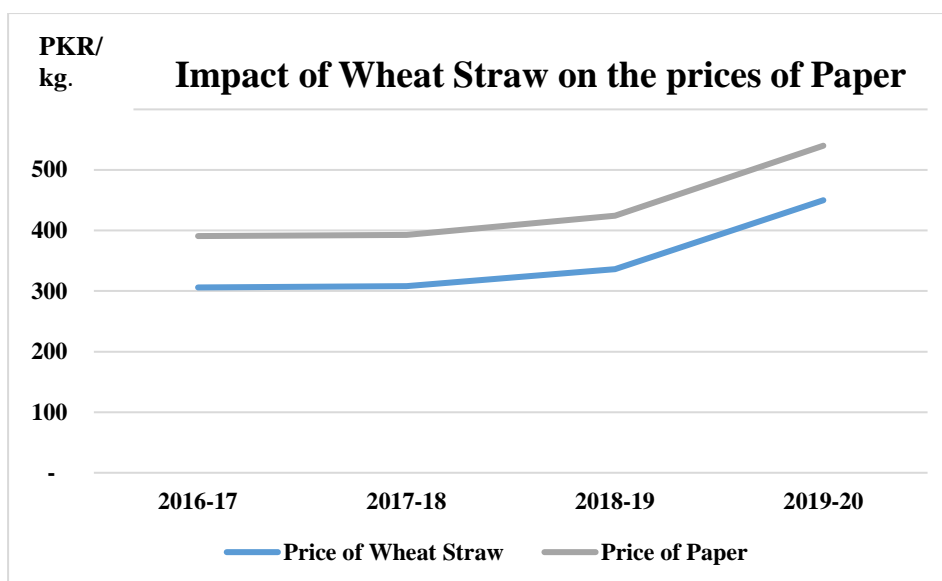
16- Since wheat straw constitutes 50% of fodder used for dietary needs fulfilment of livestock, an increase in its price has caused a corresponding increase in the prices of milk and meat. The increase in the prices of essential items as a result of increase in the price of wheat straw is presented in the graphs below which indicates a positive correlation between their prices.



Source: Milk and meat data from PBS, Wheat Straw Prices submitted by PPBM and Agriculture Marketing Information System (AMIS.pk)

As Raw Material for Pulp & Paper Industry

- 17- The indigenous pulp and paper industry produces lower quality paper primarily for the consumption of the education sector using wheat straw as its main raw material. The components in the manufacturing formula are in the following proportions:
- a. Wheat straw – 85% (eighty five percent);
 - b. Soap stone – 10% (ten percent); and
 - c. Imported wood pulp – 5% (five percent).
- 18- Although alternate raw materials can be used to manufacture pulp and paper, wheat straw appears to be the most economically viable in Pakistan since other alternates cannot be entirely sourced locally and have to be imported which drives up their cost. Wood pulp is a good source for producing good quality or virgin paper however, due to its unavailability in Pakistan, it has to be imported. Other alternates include different types of waste paper i.e. white press cutting, sorted white ledger, sorted office paper etc. 50% (fifty percent) of which is local and 50% (fifty percent) imported.
- 19- According to the industry, the approximate per kg cost of manufacturing pulp from different raw materials is as under:
- a. Wheat straw – PKR 66 per kg.
 - b. Sorted office paper (Local) – PKR 58 per kg
 - c. Sorted white ledger (Imported) – PKR 83 per kg
 - d. Wood pulp (Imported) – PKR 123 per kg.
- 20- Since wheat is abundantly available, the use of wheat straw as input in the paper industry is economically viable. It is also environmentally sustainable and the paper produced from wheat straw can be recycled and reused up to six or seven times. The indigenous pulp and paper industry is also strategically located in the vicinity of the wheat growing areas of Punjab (i.e. Lahore, Gujranwala, Faisalabad, Sheikhpura) due to ease of access to this raw material.
- 21- All the foregoing factors contribute to making wheat straw an essential input for the indigenous pulp and paper industry.
- 22- Since Wheat Straw constitutes 85% (eighty five percent) of raw material for indigenous paper industry, the increase in its price has caused a corresponding increase in the prices of paper. The graph below shows a positive correlation between prices of wheat straw and paper.



Source: Price of paper from PPBM verified through Punjab Textbook Board prices.

As Bio Energy

23- The rise in price of wheat straw is a result of its increasing use for bioenergy. Due to concerns regarding sustainability and the environment there has been a trend towards energy production from biomass. In Pakistan biomass can be produced from crop residues, animal waste (dung), agro-industrial waste (waste produced by rice mills, plywood industry, etc.) and forest waste (parts of chopped trees not removed from the forest). Crop residues such as wheat straw are generated during the harvesting activities of crops whereas others such as bagasse are generated during crop processing activities.

24- The key components in determining the availability of raw material for biomass energy are:

- a. The annual production of crops;
- b. The crop residue ratio;
- c. Willingness of the farmer to sell the crop residue (small farmers utilize wheat straw to feed their own cattle).

25- According to the World Bank Report on Biomass Atlas for Pakistan, the average crop residue ratio of major crops is as under:

Crops	Crops Residue	Average Crop Residue Ratio
Cotton	Cotton Stalks	3.40
Sugarcane	Sugarcane Trash	0.12
	Bagasse	0.30
Rice	Rice Straw	1.00
	Rice Husk	0.20

Maize	Maize Stalks	1.25
	Maize Husk	0.22
	Maize Cob	0.33
Wheat	Wheat Straw	1.00

Source: World Bank Final Report on Biomass Atlas July 2016

26- Keeping in view of the above, the technical potential of crop residues based on their existing uses (animal fodder, domestic burning etc.) is reproduced below:

Table 6: Energy Potential of Crop Residues			
Crops	Crops Residue	Lower Heating Value of Residues (Megajoules/kg)	Energy Potential of Residues (Gigawatt thermal hour/year)
Cotton	Cotton Stalk	15.0	25,054
Wheat	Wheat Straw	14.4	25,952
Rice	Rice Straw	12.5	28,868
Sugarcane	Sugarcane Trash	12.6	12,306
Maize	Maize Stalk	13.0	2,885
Total			95,065

Source: World Bank Final Report on Biomass Atlas July 2016

27- As evident from the table above, there are a number of alternate sources of biomass available in the country with bagasse and cotton being the highest energy generating crop residues.

International Perspective

28- Globally, many developed countries like China, US, Brazil, India, Sweden, Germany, Thailand, etc. have achieved milestones on their road to commercial scale straw utilization whereby with government support and innovative technologies residues are used as bio fuel, in situ fertilizer², straw board and paper.

China

29- China is one of the largest grain producers in the world and has implemented a number of strategies for the optimal utilization of wheat straw which includes the following elements:

- a. Ban on open-field straw burning.

² Meaning residues left in the field for soil fertility and stability.

- b. Using efficient technologies/machineries for harvesting wheat that reduces the amount of straw left in the field.
- c. Under the Central Government guidance, the list of National Advances Pollution Control Technologies (the first batch) introduced the comprehensive straw utilization technology by using straw as briquette fuel, power generation fuel, gasification, building materials, straw board and paper.
- d. The Government through its policies has encouraged straw utilization by providing tax incentives to enterprises for the use of straw as fuel to produce electricity or heat.
- e. Financial support policies were formulated to provide incentives for efficient straw utilization³.

India

30- India being the second largest agro based- economy has a dedicated ministry named as Ministry of New and Renewable Energy (MNRE) for the development of new and renewable energy. Government of India has also passed a National Policy for Management of Crop Residues (NPMCR), with the following main objectives:

- a. Promote the technologies for optimum utilization and in-situ management of crop residue, to prevent loss of valuable soil nutrients, and diversify uses of crop residue in industrial applications.
- b. Develop and promote appropriate crop machinery in farming practices such as modification of the grain recovery machines (harvesters with twin cutters to cut the straw).
- c. Provide financial support through multidisciplinary approach and fund mobilization in various ministries for innovative ideas and project proposals to accomplish above⁴.

31- Unlike the above cited examples, Pakistan does not have a comprehensive strategy to deal with crop residue management. The Government of Pakistan needs to develop a comprehensive strategy to optimally manage this scarce resource which may include the following elements:

³ Straw utilization in China—Status & Recommendations, School of Economics & Management, Beijing University of Chemical Technology.

⁴ Farmers to participate in national conference on crop residue management.

<https://economictimes.indiatimes.com/news/politics-and-nation/farmers-to-participate-in-national-conference-on-crop-residue-management/articleshow/71035667.cms?from=mdr>

National Policy for management of crop residues, Ministry of Agriculture India

- a. efforts to reduce wastage during harvesting (supply side),
- b. banning of burning in field; and
- c. ensuring availability of wheat straw for alternate uses.

CONCLUSION AND RECOMMENDATIONS

- 32- Based on the foregoing analysis, we are of the view that wheat straw is an essential input for dairy, livestock, and paper industries of the country. In the short term, there appears to be no readily available alternate to wheat straw. Moreover, rise in prices and shortages of this commodity has had a more pronounced impact on smaller players in these sectors since they are not able to reap the benefit of economies of scale. Dairy and meat are notified as essential products, under the Price Control & Prevention of Hoarding & Profiteering Act, 1977. They carry a high weightage in the consumer basket of goods and their prices are fixed by respective district governments and any rise in prices of these products pushes up inflation.
- 33- Similarly, the non-availability of wheat straw has led to closure of seven mills. This is an alarming situation since it not only affects livelihoods of persons associated with these units it also has repercussions on competition in the sector since only two mills producing good quality paper from imported wood pulp remain operational. There will also be a profound impact on public procurement and education budgets as provincial textbook boards procure mostly from local industry which produces low quality paper for printing of course books for students of government schools. This demand would now have to be catered through imported paper which will substantially increase cost, impact the country's foreign exchange reserves. Educational products will become more expensive placing a huge burden on education budgets as well as the common man.
- 34- Given the importance and economic potential of wheat straw, the farmers may be incentivized to reduce its wastage. Furthermore, it may be taken into consideration during the calculation of the wheat support price.
- 35- We are cognizant of the fact that the GoP under the Alternate Energy Development Board's Policy for Development of Renewable Energy for Power Generation, 2006 encourages the generation of power through the use of renewable energy sources to bring-in energy security, improve the energy mix of the country. However, we are of the opinion that this should not be at the cost of depriving the essential sectors of an important input i.e. wheat straw without which their survival is at stake. Furthermore,

we believe that for the purpose of biofuel/bioenergy various alternates to wheat straw should be utilized. These residues are in surplus and are equivalent to or have a higher energy potential than wheat straw which include rice straw, cotton stalk, bagasse, sugar trash and maize stalk etc.

36- Internationally various jurisdictions have formulated comprehensive strategies to manage this scarce resource in order for its optimal utilization.

37- Based on the urgency of the matter as a short term measure, we recommend that the respective provincial governments should outrightly ban the burning of wheat straw on the field and as fuel.

38- It is re-emphasized that meat and milk are notified as essential products and their prices are fixed by district governments. Since wheat straw is a major input for these sectors, it is imperative that its hoarding should be prevented. Under their respective Registration of Godowns Acts, the provincial governments of Punjab and Sindh may direct their Agriculture Departments to maintain records w.r.t to movement of wheat straw in and out of the godowns. Provincial Governments may take immediate action against any elements involved in hoarding under the relevant laws.

39- In the long term based on international examples, the GoP needs to formulate a comprehensive policy for the effective utilization of crop residues including wheat straw which needs to ensure that it is readily available at a reasonable price. The GoP needs to encourage research & development to find innovative solutions to reduce wastage of wheat straw which currently stands at 40% (forty percent). Reduction in wastage of wheat straw along with other crop residues would enhance their availability to be utilized as bio fuel.

Islamabad, the December 19, 2019