

## Status of Farm Tractors in Nasirabad Balochistan, Pakistan

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### Abstract:

*This study was carried out to assess the status of Farm Tractors in Nasirabad district of Balochistan. A questionnaire was prepared to ascertain the age, salvation price and model wise efficiency of farm tractor by conducting interviews of farmers during the year 2008. The statistics of farm tractors showed that in the Nasirabad, there were 458 tractors, out of which, Massey Ferguson and Belarus MTZ-70 were in dominating position. The age of tractors was in the range of 1.00-21 years averaging 10.64 years. The salvage value of almost all tractors has remarkably increased due to recent rise in tractor prices; particularly in case of MTZ-70 (Belarus) tractors. The data indicated that 97.20% MF, 98.56% MTZ-70, 100% Fiat, 50% Ford, 63.16% Ursus, 62.50% Chinese tractors were in working condition, while rest of tractors were out of order. Hence, of the total, 92.57% of tractors were in working order and remaining 7.42% were not in working condition. Farmers perceived that 94% of MF, 100% of MTZ-70, 100% of Fiat tractors were most efficient on the basis of less fuel consumption and effective field operation.*

**Key words:** Farm, Tractor, Efficiency, Balochistan, Pakistan

## **Introduction**

The use of Agricultural Machinery is increasing day by day in Pakistan like other agricultural countries of the world which has necessitated periodic stocktaking of Agricultural Machinery as a regular activity. Realizing this fact in Pakistan, the first Agricultural Machinery Census was conducted in 1968, second in 1975, third in 1984 and fourth in 1994. The current Agricultural Machinery Census was fifth in succession and conducted in 2004. It has an edge over the previous censuses on account of the fact that it has also attempted to cover bulldozers, combine harvesters, wells with pump, submersible pumps, modern irrigation systems (MISs) and a large number of farm implements for the first time (GOP, 2004).

The importance of tractors for prosperous agriculture is now acknowledged practically by all concerned. In Pakistan, there are about 500 manufacturers engaged in the production of farm machines, of which about 11 can be considered as large, 40 as medium and rest are the small scale manufacturers (Anonymous, 2006).

Many studies have been conducted on the status of farm machinery in different parts of countries of the world such as Kazmi and Ahmed (1996) developed a quantitative relationship between tractor age, annual use and labor cost for maintenance of the different makes of tractors (The tractors selected for the study were HMT Zetor - 2511, Escort - 335, Massey Ferguson - 1035 and International B-275) used by the farmers of the Allahabad district. They further developed the multiple regression models for those tractors of different makes. Similarly Wu (1998) surveyed small tractor parameters such as power, fuel consumption and maintenance costs for Gansu Province, China, over several years. He concluded that the economic service-life of tractors is around 6 years. In practice,

the renewal period for small tractors varies with the economic service-life. In a study Tanveer *et al.* (2001) conducted survey of maximum number of tractors and allied machineries in the Multan Division of Pakistan. The study concluded that: (i) the introduction of quality parts and safety devices should get first attention, (ii) the development and commercialization of efficient machines to replace the present clumsy seed drill, sprayer, wheat thresher, and trolley are important and (iii) the consumer protection and awareness should receive immediate attention to shift from supply-push to demand-pull market character. Xianguo (2008) conducted a survey on agricultural machinery industry in China. He concluded that the most of the agriculture in China has already been mechanized and further progress towards agricultural mechanization follows a constant pace of development. Therefore a present study was conducted to assess the statistics of farm tractors in the study area, their average age, salvage values and efficiency on the basis of fuel consumption and effective field operation.

## Materials and Methods

Present study was based on a survey conducted during the year 2008 to assess the status of agricultural machinery in Nasirabad district of Balochistan province. All the three Tehsils of district Nasirabad such as Dera Murad Jamali, Tamboo and Chattar were included in the study and in each Taluka various villages under intensive agriculture were selected. The details of study are given in Table-1.

**Table 1. Sample size for the survey of farm tractors in Nasirabad district of Balochistan**

Sr#	Tahsil	Number of villages surveyed	Number of farmers selected from each village	Total number of respondent farmers
1.	Dera Murad Jamali	12	05	60
2.	Tamboo	10	05	50
3.	Chattar	08	05	40
Total		30	15	150

### *Instrument/Questionnaire*

The instrument (questionnaire) was pilot tested in terms of (a) language, (b) structure formats, (c) understandability of the statements/ questions and (d) mode of responses. This practice was done for pretesting of the questionnaire, and responses over the questionnaires from the respondents, the responses and queries of the respondents were critically examined and the questionnaire was modified and updated accordingly. After satisfaction over the quality of questionnaire, the researchers proceeded personally to come in contact with the designated respondents according to a well set visit schedule. The final version improved in the light of pilot testing data, suggestions and changes was finally used for data collection.

### *Method of data collection*

The required information was obtained through the final version/ pretested questionnaire from respondents related to farming community of the district. It contained closed as well as open ended questions and covered the needed parameters. These main indicators were defined in the questionnaire i.e. to provide facility to the respondents for answering. The questions were explained before the respondents and repeated till they had a clear view on it. The answers received from the respondents were written in the blank space according to the plan. The questionnaire also contained open ended questions which covered the respondents' perceptions for their farm machinery (a) year of purchase (b) original price paid (c) present price (d) salvage value. However there were some limitations to this study; the foremost of which is the representativeness of the sample farmers, finding and recruiting participants from the target population of those in the farming community. It is compounded with its distribution limitations. Who work as a result of the online format, it was difficult to randomize sample population, to reduce variation in data. Instead, self-directed sampling was resorted, which meant

solicited particular participants and groups of respondents. Thus, the potential pool of respondents was limited to those, who were active in farming activities. In the district Nasirabad of Balochistan province some members of the target population did not participate because of their discomfort with such type of interviews. Secondly the study was limited to the perceptions of the stakeholders that participated through the sample. Thirdly, the study was limited to the district Nasirabad of Balochistan province. The data thus collected were subjected to derive means and percentages to fulfil the study requirements.

## **Results and discussion**

The status of tractors in Nasirabad district of Balochistan was conducted through interviews of the respondent farmers of study area during the year 2008. The results so obtained are reported as follows.

### *Tractors statistics*

The statistics of tractors in three Tehsils of district Nasirabad was obtained by surveying the area, it is reported that out of 458 farm tractors in the district Nasirabad, 450 were by farmers themselves and 8 were owned by various public sector departments.

### *Status of Tractors*

Statistics of farm tractors and their status in relation to make and engine power in district Nasirabad was assessed, which showed that out of total 458 tractors of varied engine powers, 250 were Massey Ferguson (England), while 139 were Russian Belarus MTZ-70, 16 were Fiat (Italy) and 2 Ford (England). A considerable number of Ursus branded tractors were also found in the district, where 19 Czechoslovakian tractors were in operation, while 16 Chinese (Tianchan/Shinghai) tractors were also the part of tractor statistics in the district. Moreover, 3

Kabota (Poland) and some other old model tractors having no particular make on their body were in operation in the study district, as indicated in Table-2.

While discussing the engine power of the farm tractors in operation, it was noted that majority of the tractors (55.24%) were of 55 horse power engines; while 30.78% having 85 horse power engines (mostly Russian MTZ tractors) and 13.31% of the total tractors were of 75 horse power engines. Three small tractors (35 horse power engines) were also come into account during this survey which was 0.65% of the total tractor statistics in the district. It was noted that MTZ-70 Russian tractors were having the most powerful engines, followed by Massey Ferguson and Ford. However, the quality of Italian Fiat tractors has also been admired by their owners.

**Table 2. Status of farm tractors in relation to their make and engine power in Nasirabad district of Balochistan**

S #	Companies	Engine power				Total
		35 HP	55 HP	75 HP	85 HP	
1.	Massey Ferguson (England)	03 (1.20)	231 (92.40)	16 (6.40)	0	250
2.	Belarus MZ-70 (Belarus)	0	0	0	139	139
3.	Fiat (Italy)	0	06 (37.50)	10 (62.50)	0	16
4.	Ford (England)	0	0	0	02	02
5.	Ursus Czechoslovakia	0	0	19	0	19
6.	Tianchan/Shinghai Tractor (China)	0	16	0	0	16
7.	Kabota (Poland)	0	0	03	0	03
8.	Others	0	0	13	0	13
Total		3 (0.65)	253 (55.24)	61 (13.31)	141 (30.78)	458

Note: Figures in parentheses indicate the percentage of tractors

### *Age of tractors*

The tractors were investigated in relation to their age, and the results indicated that 78.40 % Massey Ferguson were <5 years old, 17.20% were 6-10 years old, 3.20% were in the range of 10-

20 years and 1.20% Massey Ferguson tractors were >20 years old. In Belarus MTZ-70 tractors, 42.44 % were <5 years of age, 28.05% were 6-10 years of age, 15.02% were 10-20 years old and 13.67% MTZ-70 tractors were >20 years of age. In case of Italian Fiat, 25% of them were <5 years old, 43.75% had 6-10 years age and 31.25% Fiat tractors were older than 20 years, the results are presented in Table-3 The details further indicated that only two Ford tractors existed in operation, which were nearly 20 years old, while 42.10% of Czechoslovakian Ursus were in 6-10 years of age, 47.36% were 10-20 years old and remaining 10.52% were more than 20 years old. Similarly, 31.25% Chinese tractors were <5 years of age and remaining 68.75% were 6-20 years old. Out of three Polish Kabota tractors, one was more than 20 years of age and other two were 10-20 years of age.

On average, out of 458 total tractors existed in the district of study, 57.65% were having age below 5 years, 24.89% were in the age range of 6-10 years, 10.91% tractors were 10-20 years old and 6.55% of the tractors were more than 20 years of age.

**Table 3. Status of farm tractors in relation to their age in Nasirabad district of Balochistan**

Sr#	Companies	Tractor age (years)				Total
		<5 years	6-10 years	10-20 years	>20 years	
1.	Massey Ferguson (England)	196(78.40)	43 (17.20)	08(3.20)	03(1.20)	250
2.	Belarus MTZ-70 (Belarus)	59(42.44)	39 (28.05)	22(15.82)	19(13.67)	139
3.	Fiat (Italy)	04(25.00)	07 (43.75)	05(31.35)	0	16
4.	Ford (England)	0	0	02	0	02
5.	Ursus Czechoslovakia	0	08 (42.10)	09(47.36)	02(10.52)	19
6.	Tianchan/Shinghai Tractor (China)	05(31.25)	11 (68.75)	0	0	16
7.	Kabota (Poland)	0	0	02(66.67)	01(33.33)	03
8.	Others	0	06 (46.15)	02(15.36)	05(38.46)	13
Total		264(57.64)	114 (24.89)	50(10.91)	30(6.55)	458

**Note: Figures in parentheses indicate the percentage of tractors**

### *Salvage value of tractors*

The salvage value of tractors of different makes and models was enquired by the respondents and outcomes were presented in

Table-12. The salvage value of MF-80 tractor purchased in 1990, 1995, 2000 and 2005 estimated to 165000, 190000, 265000 and 400000 rupees, respectively against current company price of 480000. The salvage value of MF-260 tractor purchased in 1990, 1995, 2000 and 2005 was anticipated to 175000, 200000, 335000 and 500000 rupees, respectively against current company price of 625000. The salvage value of MF-375 tractor purchased in 1990, 1995, 2000 and 2005 was anticipated to 185000, 215000, 395000 and 585000 rupees, respectively against current company price of 725000 rupees.

Similarly, Ford-370 is one of the powerful engine tractors and the salvage price of tractors purchased in 1990, 1995, 2000 and 2005 was estimated to 270000, 325000, 460000 and 625000 rupees, respectively against current company price of 795000 rupees. In case of Russian MTZ-70, the salvage value of tractor purchased in 1990, 1995, 2000 and 2005 was expected to 410000, 450000, 500000 and 700000 rupees, respectively against current company price of 865000 rupees.

Two models of Fiat tractor were recorded with the farmers in Nasirabad district of Balochistan, and it was noted that the salvage price of Fiat-640 tractor purchased in 1990, 1995, 2000 and 2005 was expected to 280000, 300000, 400000 and 495000 rupees, respectively against current company price of 615000; while for Fiat-480 model salvage price was 210000, 265000, 325000 and 345000 rupees, respectively against current company price of 430000 rupees.

Among other tractors, the salvage price of Ursus tractors purchased in 1990, 1995, 2000 and 2005 was to the ceiling of 115000, 170000, 230000 and 265000 rupees, respectively against current company price of 360000; while Chinese tractors purchased in 1995, 2000 and 2005 have estimated salvage value of 120000, 200000 and 255000 rupees, respectively against current company price of 360000. Another tractor named as Kabota purchased in 1990, 1995, 2000 and 2005 has the salvage value of 165000, 185000, 275000 and



290000 rupees, respectively against current company price of 380000. The salvage value of the tractors as reported by the farmers was further confirmed by the dealers and tractor mechanics.

**Table 4. Original price and salvage value of tractors according to their age in Nasirabad district of Balochistan**

S #	Tractor Models	Original price and salvage value (Rs)								Current price
		Purch. in 1990	Salvage value 2008	Purch. in 1995	Salvage value 2008	Purch. in 2000	Salvage value 2008	Purch. in 2005	Salvage value 2008	
1.	MF-80	95000	165000	135000	190000	200000	265000	300000	400000	480000
2.	MF-260	110000	175000	151000	200000	295000	335000	425000	500000	625000
3.	MF-375	135000	185000	168000	215000	365000	395000	535000	585000	725000
4.	MTZ-70	240000	410000	285000	450000	375000	500000	565000	700000	865000
5.	Fiat-640	220000	280000	260000	300000	320000	400000	410000	495000	615000
6.	Fiat-480	190000	210000	225000	265000	285000	325000	325000	345000	430000
7.	Ford-370	200000	270000	240000	325000	365000	460000	522000	625000	795000
8.	Ursus	135000	115000	165000	170000	180000	230000	268000	265000	360000
9.	Tianshan/Shinghai	-	-	155000	120000	165000	200000	235000	255000	360000
10.	Kabota	190000	165000	200000	185000	225000	275000	300000	290000	380000

### *Condition of tractors*

While obtaining the statistics of tractors and perception of farmers regarding their condition, it was noted from the results in Table-16 that out 250 Massey Ferguson tractors, only 2.80% were out of order and remaining 97.20% were in working condition. Out of 139 Belarus MTZ-70 tractors, 98.56% were in working condition and all the Italian Fiat tractors were in working order.

In case of two Ford tractors, one was in working condition and one was out of order, while out of 19 Ursus tractors 36.84% were out of order and remaining 63.16 were in working condition. Similarly, 37.50% of 16 Chinese tractors were out of order and remaining 62.50% were in working condition; while among three Kabota tractors, two were out of use and only one was in working order. Besides, most of (69.23%) other 13 old tractors, their make and model could not be perceived by the farmers were out of order and of them only 30.77 were found in working condition. Hence, out of the total 458 tractors existed with the farmers and in the public sector

departments, 92.57% were in working order and remaining 7.42 were out of order.

**Table 5. Condition of farm tractors as reported by their owners in Nasirabad district of Balochistan**

S #	Companies	Condition of Tractor		Total
		Working order	Out of order	
1.	Massey Ferguson (England)	243(97.20)	07(2.80)	250
2.	Belarus MZ-70 (Belarus)	137(98.56)	02(1.44)	139
3.	Fiat (Italy)	16	0	16
4.	Ford (England)	01(50.00)	01(50.00)	02
5.	Ursus Czechoslovakia	12(63.16)	07(36.84)	19
6.	Tianchan/Shinghai Tractor (China)	10(62.50)	06(37.50)	16
7.	Kabota (Poland)	01(33.33)	02(66.67)	03
8.	Others	04(30.77)	09(69.23)	13
Total		424(92.57)	34(7.42)	458

Note: Figures in parentheses indicate the percentage of tractors

### *Efficiency of tractors*

The efficiency of the tractors in operation in Nasirabad district of Balochistan was evaluated through perception of tractor owners and responses to this effect were given in Table-18. The results indicated that highest majority of Massey Ferguson tractors (94%) were reported as most efficient and 3.20% as average. The perception was developed by the farmers on the basis of fuel consumption for a certain field operation. However, 100% of the Belarus MTZ-70 and Italian Fiat tractors were reported as “most efficient” on the basis of above criterion.

The remaining makes and models of tractors were reported as average, even a considerable percentage of Czechoslovakian Ursus and Chinese Tianshan/Shinghai tractors were ranked as below average efficient tractors.

**Table 6. Efficiency of tractors as reported by their owners in Nasirabad district of Balochistan**

Sr #	Tehsils	Efficiency of tractors				Total
		Most efficient	Averagely efficient	Below average	Out of order	
1.	Massey Ferguson (England)	235 (94.00)	08 (3.20)	0	07 (2.80)	250
2.	Belarus MZ-70 (Belarus)	137 (98.56)	0	0	02 (1.44)	139
3.	Fiat (Italy)	16	0	0	0	16
4.	Ford (England)	01 (50.00)	0	0	01 (50.00)	02
5.	Ursus (Czechoslovakia)	0	11 (57.89)	01 (5.26)	07 (36.84)	19
6.	Tianchan/Shinghai Tractor (China)	0	05 (31.25)	05 (31.25)	06 (37.50)	16
7.	Kabota (Poland)	0	01 (33.33)	0	02 (66.67)	03
8.	Others	0	04 (30.77)	0	09 (69.23)	13

Note: Figures in parentheses indicate the percentage of machinery and implements

This study has shown that Massey Ferguson and Belarus MTZ-70 made tractors were in dominating position, and the salvage value of almost all tractors has remarkably increased due to recent rise in tractor prices; particularly in case of MTZ-70 (Belarus) tractors. Most of the tractors, implements and other machinery were in working condition. Farmers showed more satisfaction over the efficiency of MTZ-70, Massey Ferguson and Fiat tractors on fuel consumption and effective field operation basis. Most of the tube wells installed in the study areas are electricity operated; while diesel engine tube wells were also found in the private sector.

These results demonstrate a positive indication regarding the area of study, where mechanized farming has been adopted by the farmers, particularly because most of the land area of Nasirabad district is owned by big landlords having unlimited resources to purchase modern machinery and achieve higher crop yields. Similar studies were conducted in China by Wu (1998) and reported that the economic service-life

of tractors is around 6 years; while in our present study the average age of tractors in Nasirabad district was over 10 years. The economic service life of tractors is mainly associated with the working condition, maintenance of tractor and per day working hours. From India, Shyam (1998) reported that most farmers in Madhya Pradesh province of India possessed tractors of 30 HP, while in Nasirabad district, mostly 55 HP tractors are preferred, this difference might be due to difference in soil structure and according to the need tractors are selected. Shukla and Jain (1999) indicated that farmers with an operational land holding 12 hectares preferred tractors 35 HP. Natsis and Papadakis (2002) reported use of similar implements in the field in Bulgaria and suggested that the best combination was semi mounted moldboard plough having 5 plough furrows and tractor of 100 HP. From Mexico, Magnavacchi (1993) reported that locally manufactured tractors are used, farming is operated by machines, tractors, planters, harvesters, threshers and all kind of locally manufactured implements are in use.

The above findings from Mexico are bit contradicting to our results, because technologically Mexico is a well established country, while we are not manufacturing tractors, harvesters, planters; but threshers of good quality and all other quality field implements are being locally manufactured in Pakistan.

As per our results, the most popular tractor is Belarus MTZ-70, followed by Massey Ferguson, while Aked (1994) reported that Ford and Belarus tractors are imported for heavy transportation in Sweden. Patrick *et al.* (2002) found that Massey-Ferguson make tractors were used mainly for ploughing in Botswana. Similarly, Cartwright (1994) reported from United Kingdom that Massey Ferguson tractors of different horse power are popular in the Wales state, while high horse power Ford are also famous at the farms; Stopalov (1994) concluded that MTZ tractors are relatively high fuel consuming tractors as compared to other makes but MTZ is most efficient

in high power operations. From another study, Al-Suhaibani and Wahby (1995) indicated that big tractors have better distribution of repair and maintenance costs than smaller tractors; while Emert *et al.* (1995) suggested that disadvantages resulting from poor or irregular maintenance were found to be reduced reliability, increased fuel consumption, decreased engine power, reduced engine lifespan and increased exhaust emissions. Kazmi and Ahmed (1996) studied HMT Zetor - 2511, Escort - 335, Massey Ferguson - 1035 and International B-275 tractors including 80 tractors of different age groups and reported Massey Ferguson was more efficient in field operations than other tractors. From Pakistan, Tanveer *et al.* (2001) suggested that development and commercialization of efficient machines to replace the present clumsy seed drill, sprayer, wheat thresher, and trolley are important.

## **Conclusions and recommendations**

Massey Ferguson and Belarus (MTZ-70) made tractors were dominated in Nasirabad district, which were considered as the most efficient among all other farm tractors. Also the salvage of these tractors purchased in the nineties was more than their original price. The average age of tractors was 10.64 years.

The salvage value of almost all tractors has remarkably increased due to the recent rise in tractor prices; particularly in case of MTZ-70 (Belarus) tractors. Out of the total 458 tractors owned by the farmers and the public sector departments, 92.57% of farm tractors were in working condition and remaining 7.42% were out of order. However the MTZ-70 Belarus tractor was less efficient on the basis of fuel consumption, but it was found most efficient in field operations and transportations.

The MTZ-70 followed by Massey Ferguson and Fiat are highly demanded tractors in the study area; therefore the government should provide these tractors to farmers on easy

terms and conditions. It is also suggested that Balochistan government should arrange training programmes for the farming communities in maintenance of tractors, implements and other machinery.

In the study it was observed that there is no coordination between farmers and Agriculture Engineering Department of Balochistan, it is suggested that the coordination and linkage may be established between farmer and Agriculture Engineering Department to improve the efficiency of farm machinery.

### **ACKNOWLEDGEMENTS**

The authors thank to the reviewers for their valuable comments on earlier draft of this article, where help of Prof. Dr. Habibullah Magsi (Economist) is highly acknowledged for critical review of this article. Errors in interpretation are those of the authors.

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