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Post-harvest Losses during Marketing of Organic Turmeric in Kakching District of Manipur, India

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ABSTRACT

The Present study on Post harvest losses during marketing of Organic turmeric in Kakching district of Manipur was initiated during 2020 to 2022 with the selection of 120 respondents and it was categorized into four groups *viz.*, Marginal, Small, Semi medium and medium sizes groups based on available cultivable land under selected spice crops. To achieve the specific objective of the present study a multistage purposive stratified random sampling method were adopted. Further data reveals that on the selected farm size group in accordance to operational land holding the majority of the respondents (84.00 percent) belonged to semi-medium land holding with an area of 2.01-3.0 ha. While majority of the respondents (82.00 percent) in accordance to land holding size under turmeric cultivation belonged to semi medium land holding with an area of 2.01-3.0 ha. The post harvest loss incurred for turmeric for turmeric at field's level was found to be maximum on medium farm size group with 19.65 percent. While the post harvest losses incurred at trader's level at various stages of marketing of turmeric. The highest estimated loss was incurred by processor with 3.00 percent, followed by wholesalers with 0.10 per cent and retailer with 0.01 percent respectively.

Keywords: Post harvest, organic turmeric, marginal, operation, turmeric cultivation

USDA defines organic farming as "Organic farming is a system of which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc.) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manure, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection" (TNAU Agritech Portal).

According to FiBL survey on certified organic agriculture worldwide there were 74.9 million hectares of organic agricultural land in 2022. The regions with largest areas of organic agricultural land are Australia (35.69 million hectares) and Argentina (4.45 million hectares), Uruguay has (2.7 million hectares), India (2.66 million hectares), France (2.55 million hectares), Spain (2.44 million hectares), China (2.44 million hectares), USA (2.33 million hectares), Italy (2.10 million hectares) and Germany (1.70 million hectares).

Organic crop production in the organic farming system is gradually gaining momentum worldwide. It is based on the minimal cost of the off-farm inputs and management practices that restore maintain and sustain ecological harmony. Organic crop production is not only a holistic approach of production system that gives quality "Organic

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food", but help to restore soil fertility on long term basis. It is relatively independent production system compared to conventional agriculture, which depends mostly on synthetically produced inputs i.e. fertilizers, fungicides, insecticides, herbicides, growth regulator etc. In the organic crop production system, it is observed that there is yield drop during conversion period as it takes time for the soil and plants to reach equilibrium. Yield of crops rise again once management system get established (Munda *et al.* 2007).

Turmeric (*Cucurma longa*) is a commercially important spice of India and it belongs to the family Zingiberaceae. The spice also sometimes called "Indian saffron" attributed to its yellow color. It has the highest diversity comprising 40 species (Ashraf *et al.* 2017) and some are important varieties exported outside. In developed countries, turmeric is mostly sold in the form of fine, dried, and yellow powder. Turmeric may have originated from South or South-East Asia, but its center of domestication is certainly the Indian subcontinent. India is the major producer of turmeric, and it is also the major user of its own production in the meantime. Other producers in Asia include Bangladesh, Pakistan, Sri Lanka, Taiwan, China, Burma (Myanmar) and Indonesia. Turmeric is also produced in the Caribbean and Latin America: Jamaica, Haiti, Costa Rica, Peru, and Brazil. Ground turmeric powder exports from India were 12,000 t in 1999, and had doubled in 10 years from 1990 to 1999. During the same period, turmeric oil and oleoresin exports rose from 0.5 t to 4.0t and from 150 to 250 t, respectively (Weiss, E.A. 2002).

Table 1: Categorization of respondents in accordance to operational land holding (ha)

Land holding size	Sample size Total	Total operational land holding (ha)	Average operational land holding (ha) in percentage (%)
Marginal (below 1 ha)	1	1.00	1.00
Small (1.01-2.0 ha)	23	23.5	12.00
Semi-medium (2.01-3.0 ha)	93	167	84.00
Medium (Above 3 ha)	3	7.5	4.00
Total	120	199.00	100

In India, turmeric crop occupies about 6.37 per cent of the total area under spices and condiments grown (Spice Board, 2019-20). Turmeric ranks fourth in production in the country with a total production of 9,38,955MT under a total area of 2,45,958 ha in the year 2019-20 (Spice Board., 2020). The country is not only the largest producer and consumer but is also the largest exporter of turmeric in the world. India dominates the world production scenario contributing 78.00 per cent followed by China (8.00 per cent), Myanmar (4.00 per cent), Nigeria and Bangladesh together contributing to 6.00 per cent of the global production (Viraja *et al.* 2018). Telangana state is the leading state under turmeric cultivation (51.00 thousand ha) and in terms of production (294.00 thousand MT) contributing about 27.84 per cent to the total country's production in 2016-17. The others major states in turmeric production in the country are Maharashtra (177.85 thousand MT), Tamil Nadu (112.59 thousand MT) and Andhra Pradesh (79.73 thousand MT).

Manipur enters into organic map with the launching of National centre for organic in 2004 three field demonstration were conducted in different location viz. (Thoubal, Imphal East). Tarengpokpi, Keithelmanbi and Tentha after a month long advertisement on importance of organic farming through AIR (rural program) and local program sponsored by SFAC and has created an immense platform throughout the state in mobilising organic farming by providing composite owned by privates and NGO's in three district of Manipur *viz.*, Thoubal, Imphal East, Imphal West and Senapati and has promoted the first model of contract farming of 23.00 ha of turmeric in 2004 financed by SBI, Imphal and 75.00ha (SFAC, 2004).

Ningombam *et al.* (2019) in their paper entitled "Post harvest losses at various stages of handling from farm level to the consumer in Manipur". The Post harvest losses at farm level were competent which counted with a loss of 8.44 percent loss. At wholesale market including transportation accounted for about 93 percent. The losses at retailer storage unit and consumer level accounted for about 5.46 percent, 3.19 percent and 6.83 percent respectively the post harvest loss at different stages from farm level up to the consumers accounted for about 34.49 percent.

Turmeric is mostly marketed in raw and powdered

form. The local demand is generally lesser, so large amount of produce is available as marketable surplus. However due to the perishable nature of the commodity a significant number of losses occur during transportation (SYMSAC-IX, 2018). According to the FAO estimate, 25.00 per cent of the turmeric crops are affected by mycotoxins each year and crop loss due to alflatoxon and 20.00 to 25.00 per cent of the produce is wasted due to damaged post-harvest management during storage, grading and transportation (SYMAC-VII, 2013).

According to a report prepared by National Institute of Agricultural Marketing (NIAM) on marketing strategies for organic produce of Manipur. Even though the produce from Manipur is organic it has not been branded and positioned as premium protest. Most of the spices and plants are available in market throughout the year and steeping up in spice production is primarily due to increase in yield growth though quantity available varies with seasons or months and the prices are same in all season except lower during growing or availability period of a particular species (Singh *et al.* 2020). Due to lack of organised market and marketing channel of organic spices the produce sold at conventional market results a great loss in value of organically grown crops. The state lacks in post-harvest infrastructure and market access also most farmers are traditional and do not want to take a risk. They sold the produce either in local market or to local trade. For the present study two blocks viz., Kakching and Langmeidong were selected. For the marketing and post harvest loss activities or information with the help of FPO's and progressive farmers altogether 120 respondents from wholesaler, 50 respondents from retailers and 10 respondents from consumers were selected.

Table 1 reveals that the categorisation of respondents in accordance to operational land holding (ha) size groups, the majority of the respondents (93.00 per cent) belong to semi-medium (having a land holding of 2.01-3.0 ha) and (total operational land holding of 167 ha), while 23.00 percent of the respondents were of small (having an land holding of 1.01-2.0 ha) and the (total operational land holding was 23.5ha) and 3.00 percent were medium farm size group (having a land holding of above 3 ha) with their (total operational land holding of 3.00 ha) and 1.00 percent respondent belong to marginal farm size group (having a land holding size below 1ha) with the (total operational land holding 1.00 ha) respectively.

Table 2 reveals that the categorisation of respondents in accordance to land holding size under Turmeric cultivation, the majority of the respondents (93.00 per cent) belong to semi medium (having a land holding of 2.01-3.0 ha) and total turmeric land holding was (140.5 ha), while (23.00 per cent) of the respondents were of small (having an landholding of 1.01-2.0ha) with the total turmeric land holding (22.5ha), (3.00 percent) respondents belong to medium (having a landholding above 3ha) with their total land holding (7.00ha) and the minimum farm size group marginal (below 1.00ha) with (land holding below 1ha) and total turmeric land holding (1.00ha) respectively.

Table 2: Categorization of respondents in accordance to operational land holding size under Turmeric cultivation

Category	Sample size total	Total Turmeric land holding (ha)	Average Turmeric land holding (ha) in percentage (%)
Marginal (Below 1.00 ha)	1.00	1.00	1.00
Small (1.01-2.0 ha)	23	22.5	13.00
Semi-Medium (2.01-3.0 ha)	93	140.5	82.00
Medium (Above 3 ha)	3.00	7.00	4.00
Total	120	171	100

Post-harvest loss estimation of organic turmeric at different stages of marketing

Bunsa (2019) conducted a research on evaluation of post-harvest practices in turmeric (*Curcuma longa* L.) in relation to quality among selected four Barangays of Maranatao Lanao Del Sur and concluded that turmeric grown for market potential was quite profitable and it served as a source of income to mainly to homemakers who grew them at their backyard of their homes as it could be cultivated without even using chemical fertilizers and processing could also be done in an easy way using simple grinder or pestle with mortar.

Egyir *et al.* (2008) gave a formula which was used for this calculation.

$$Percentage\ (\%)\ TQ = Q/TQ \times 100$$

Where,

$\%TQL$ = percentage post-harvest loss per commodity.

Q = mean quantity loss of the commodity

TQ = mean total quantity loss of the commodity

RESULTS AND DISCUSSION

The post harvest losses can be occurred at any stage of the marketing chain, while the post harvest losses in terms of horticultural aspects are different from economic aspects. In case of turmeric as stated by the respondents there were losses at field level due to pest and diseases. However, moisture loss is an important aspect for drying of flakes followed by processing into powdered form at processor level.

Table 3 reveals the post-harvest loss incurred for turmeric at field level at various stage of marketing of turmeric. The highest estimated loss was for medium farmers (18.34 percent), followed by marginal (19.17 percent) and small (18.58 percent).

Table 4 reveals the post-harvest losses for turmeric at processor, wholesaler and retailer level while it was found maximum at processor with an average losses

Table 3: Post-harvest losses for turmeric at field level

Sl. No.	Particulars	Average quantity Produced (Kg)	Average loss (Kg)	Price per Kg through wholesalers (₹)	Price per kg through processors (kg)	Estimated loss to quantity produced (%)
1	Marginal	8770.00	1680.97	15.00	61.80	19.17
2	Small	7803.96	1448.98	17.00	65.99	18.58
3	Medium	9408.38	1849.21	16.15	63.97	19.65
	Average	12037.67	2207.99	14.67	63.07	18.34

Table 4: Post-harvest losses for turmeric at processor, wholesaler and retailer level

Sl. No.	Particular	Average quantity procured	Average loss (Kg)	Estimated loss to quantity produced (%)
1	Wholesalers	2,279.02	2.28	0.10
2	Processors	2,276.74	68.37	3.00
3	Retailers	2,289.61	0.18	0.01
	Average	76060	7.87	1.03

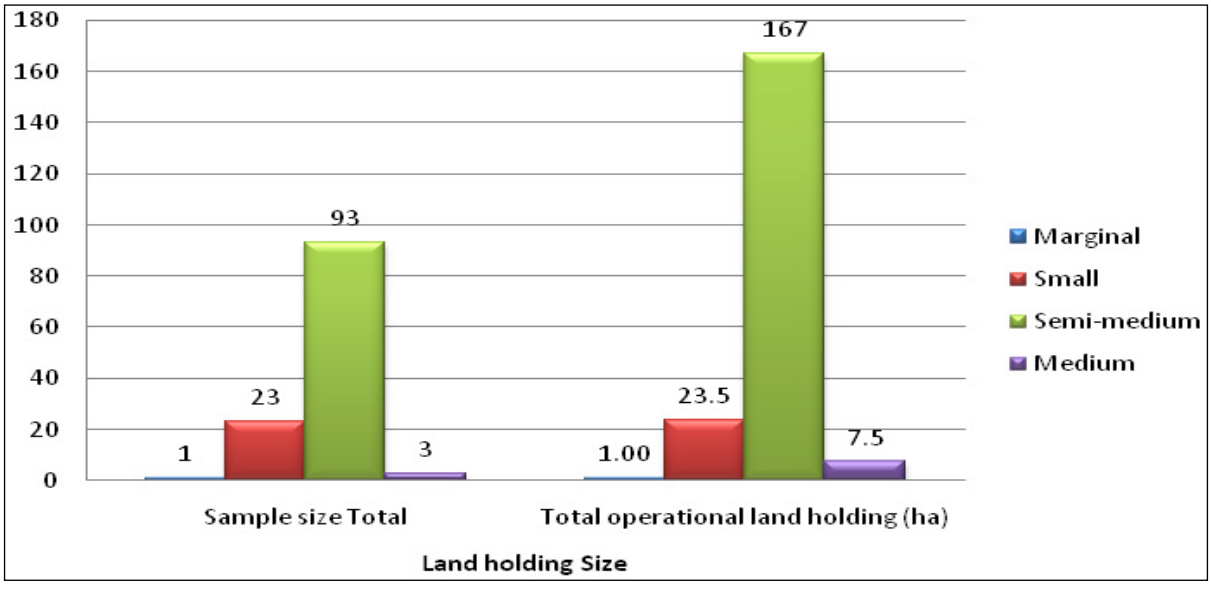

Fig. 1: Categorisation of respondents in accordance to operational land holding (ha)

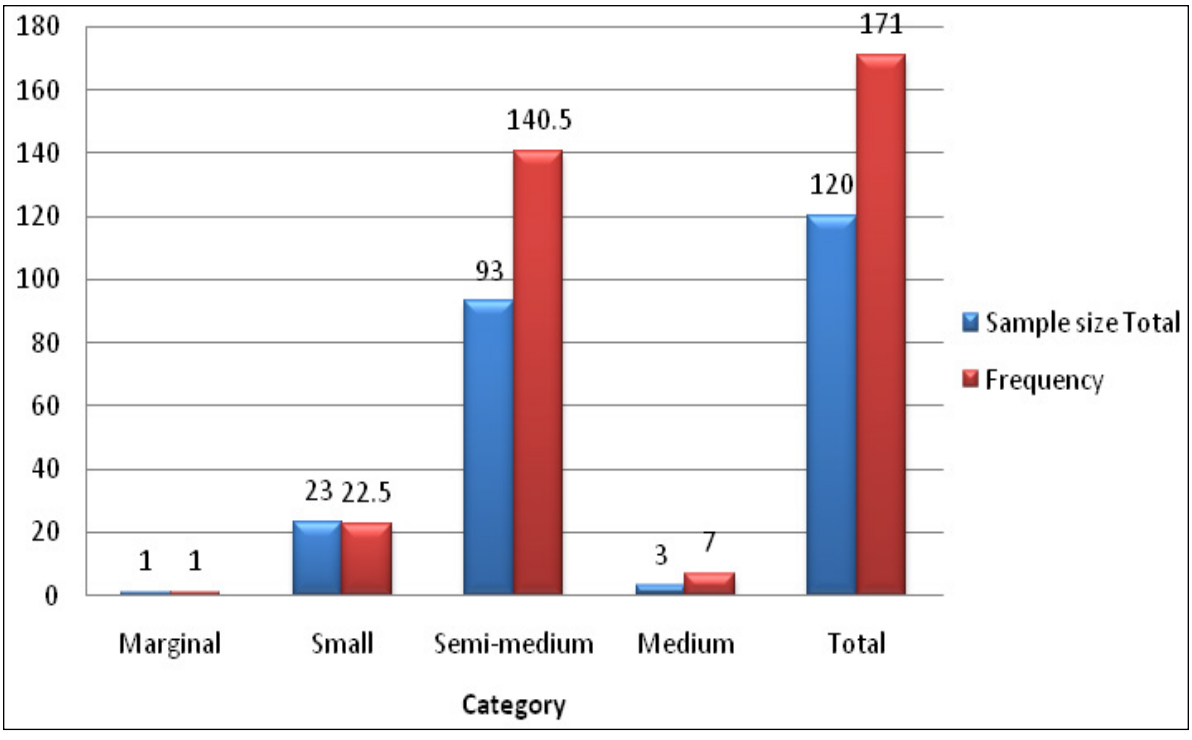

Fig. 2: Categorisation of respondents in accordance to operational land holding size under Turmeric cultivation

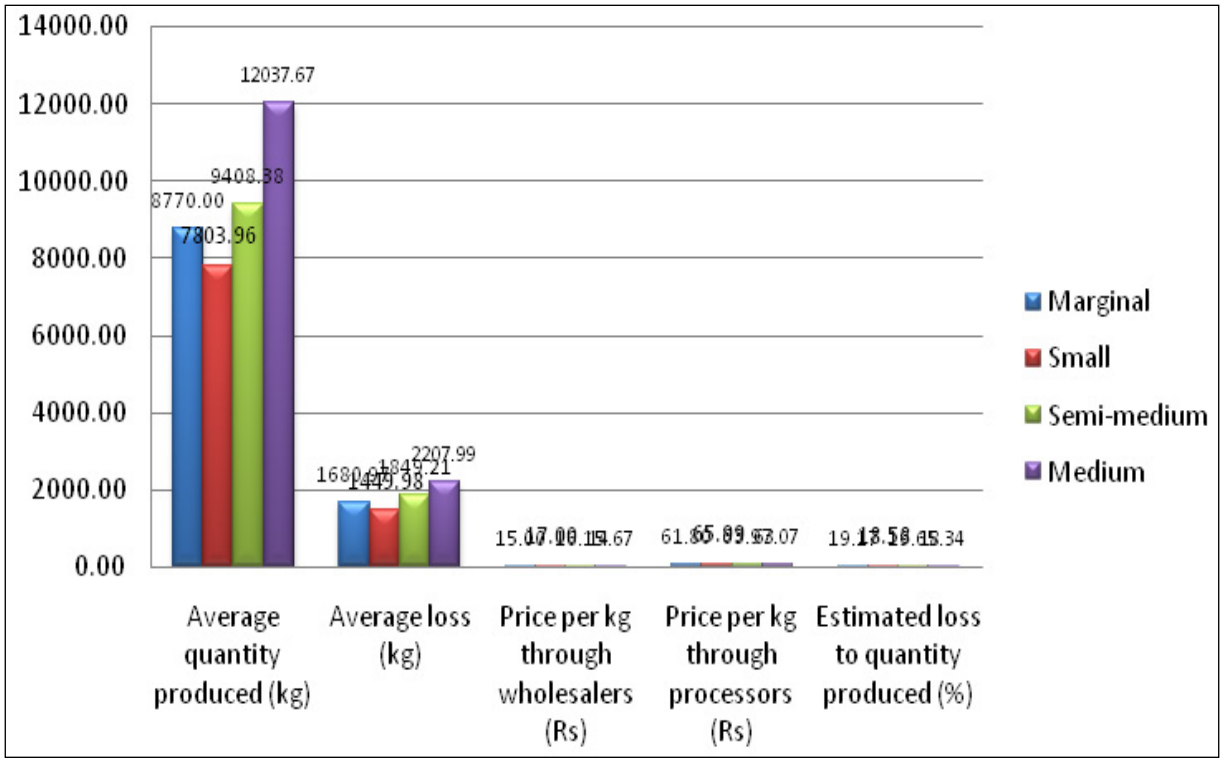

Fig. 3: Post harvest losses incurred for turmeric at field level

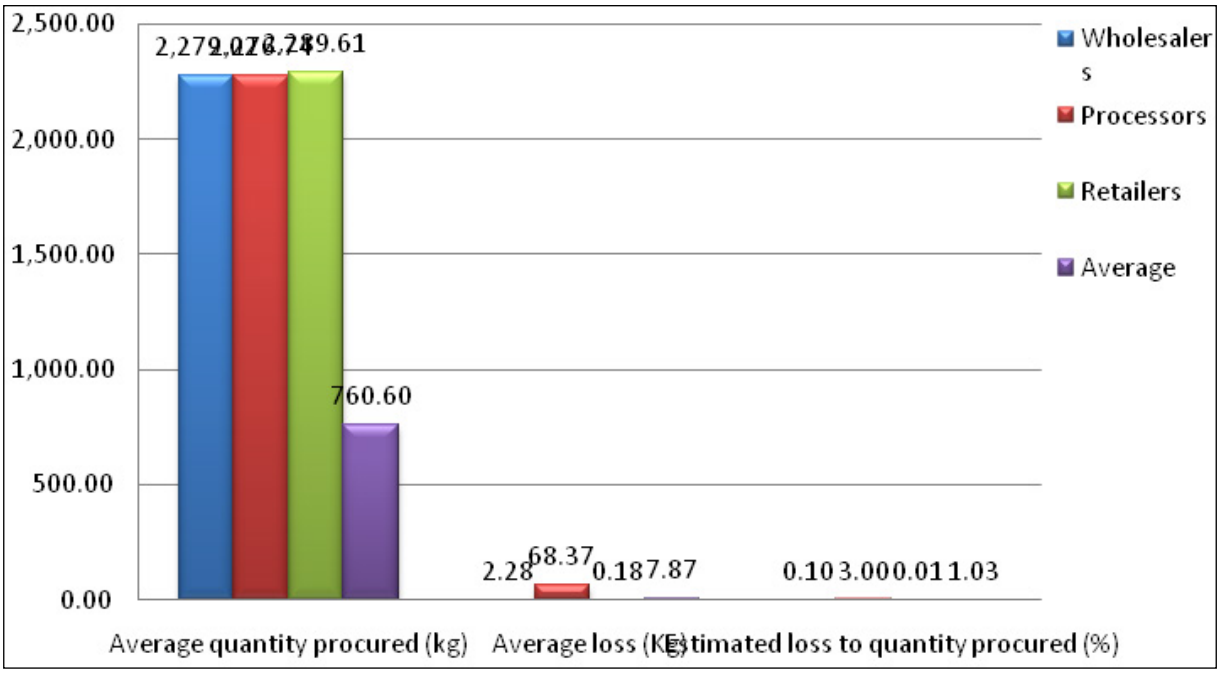

Fig. 4: Post harvest losses for turmeric at processor, wholesaler and retailer level

per kg of 68.17kg (3.00 per cent) due to maximum loss of moisture during drying, followed by 2.28 kg (0.10 percent) on wholesaler and it was found least on retailer 0.18 kg (0.01 percent).

In conclusion, in the assessment of post harvest losses for turmeric, the highest estimated loss was for medium farmers (19.65 percent), followed by marginal (19.17 percent) and small farmers (18.58 percent) while assessing the post harvest loss of turmeric at processor, wholesaler and retailer level the highest is estimated loss of 3.00 percent was incurred by processor followed by wholesaler (0.10 percent) and retailers (0.01 percent), respectively.

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