

Human and physical factors involved in indigenous processing for value addition of rice

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■ **ABSTRACT :** In Assamese culture, many bi-products of rice are prepared with indigenous techniques and are under women's work domain. Preparations of these products are highly skillful and are labour intensive. These ready to eat nutritious products from modern 'health food' viewpoint are highly acceptable but quality is observed to be not always satisfactory. This could be due to paying of less attention to economic use of human factors and comfort in the work place. These aspects of work provide comfortable work condition and consequently promote health and efficiency of the worker that help to maintain quantity and quality of products. In this context, the study was undertaken to analyse human factors and physical factors in work place involved in processing of aforesaid products. Study revealed that 86 per cent of the workers complained of high to medium discomfort in the lumbo sacral region, which might be due to adoption of awkward postures. Rating perceived exertion of the workers was reported as 'high' indicating the work to be fatiguing, the reason might be low level of illumination in the kitchen, time consuming aspects/factors at work and need to attend to other household tasks simultaneously. In all, the physical conditions in the work place were found to be less conducive to workers. To improve human and physical factors for economic upliftment of rural women involved in self-help groups in Assam in particular, proper interventions could be planned.

■ **KEY WORDS:** Rice, Indigenous processing, Value addition of rice

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Processing or value addition to the paddy in cultural context of Assamese people can be attributed to number of by-products relished by the people in general. These value added products processed with age old indigenous techniques are many in types and numbers. As is the common practice, these activities of processing of value added products are under women's work domain. Preparation of all the value added products involves high skill and is labour intensive. These ready to eat instant and nutritious products from modern 'health food' concept view point too are now highly acceptable. Though these have previously under gone some negligent approach because of cultural infestation with junk food, but have presently geared momentum in its adornment and popularity because of nutritious and appetizing factors. Acceptability of these products by masses requires

quality maintenance. These foods can keep up to the contemporary standards if prepared with scientific interventions and can attain higher economic potential. Now women in rural sector in Assam have organized themselves for economic empowerment through SHG revolution and have taken up processing as one of the entrepreneurial activities. But it has been observed that most of these products are not always sound in quality and presentation. Now attentions are given to the economic use of human resources in order to provide comfort in the physical setting of the work place and consequently to promote health and efficiency of the workers to maintain quantity and quality of products. In this context, an attempt was made to analyse the human and physical factors involved in aforesaid processing of value addition to paddy and to see if it conforms to the existing recommendations of

certain basic ergonomic standards. So, the interventions can be provided to this sector to enhance quality and quantity of products which have higher potential of economic upliftment of rural women for empowerment.

Objectives :

- To assess human factors involved in the processing of paddy for value addition.
- To study the existing physical factors in the workplace environment in basic ergonomic terms.

RESEARCH METHODS

- Investigation covered the following parameters.
- Administration of questionnaire on fifty subjects performing the activities and statistical analysis of the data in terms of frequency and percentage.
 - Visual observation of workplace as well as with instruments like luxmeter, thermometer and measuring tape.

RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Human factors :

Value added products that are generally made are flaked rice, puffed rice, popped rice (two varieties), pre-roasted rice flour, rice flour, glutinous rice flour delicacies like *till pitha*, *ghilla pitha*, *thupa pitha*, *methoi*, *kumal chawal*, *boja chawal* etc. To prepare these products, many sub activities are involved such as proper sundrying, parboiling, pounding in *dheki* (traditional leg operated pounder), roasting, sieving, cleaning, frying etc. These processing activities require certain stipulated time frame for doneness involving high skill and intense labour thereof. While accomplishing, subjects are observed to adopt certain unsuitable postures frequently such as stooping, squatting, bending, standing continuously for long etc. Thus, the study indicated the following aspects:

Higher frequency of abrupt postural change and continuous static work in particular posture, demands greater physical efforts and causes aches of high to medium level in different body parts. Amongst the respondents, 57 per cent reported high discomfort level in lumbo-sacral region of vertebral column and 86 per cent reported medium to lower level.

Excessive exposure in hot sun, near fireplace, continuous working along with daily household chores result in dehydration and exhaustion. But majority of the subjects lack awareness (86 %) regarding dehydration due to excessive sweating and 84 per cent were not aware that inadequate intake of water results in urinary disorders and fatigue.

Although rural Assamese women always wear homemade hand woven clothes, but with cheap and easy availability of synthetic mill made clothes, they have taken to these which are not very comfortable. It was found that forty five per cent of subjects lacked awareness regarding positive aspects of wearing cotton clothes. This often resulted in skin rashes, skin irritation and onset of prickly heats especially during hot and humid days.

The processing activities are always perceived as exhaustive which may be attributed to certain adverse factors and working conditions that the subjects are unaware of ‘Rating perceived exertion’ was reported ‘high’ (4.1) by 67 per cent assessed by simple 5-point scale reproduced from 10-point rating scale of Borg (1982), indicating the activities to be highly tiring or exhaustive.

Physical factors :

The physical factors considered in the study refer to the physical conditions in the workplace that the workers are exposed to while processing for value addition of paddy. For maximum comfort and efficiency in working at the fireplace/ indoor/ outdoor, important factors to be considered are proper light, ventilation, environmental temperature, suitable seat, etc. These are fundamental factors because inadequate light causes eye irritation, vision impairment etc. while excessive

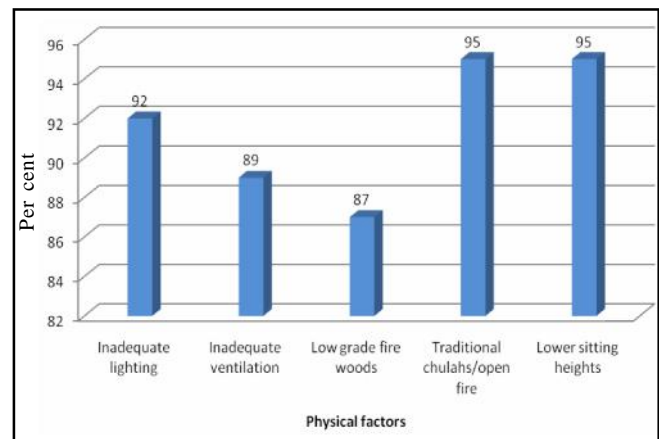


Fig. 1 : State of physical factors in the work place environment

Table 1 : Comfortable limits and existing state of physical parameters

Parameters	Comfortable limits	Existing state
Temperature level	26°C – 28°C	30°C – 31.5°C
Illumination level	750 – 300 lux	102 – 135 lux
Sitting heights (<i>pira</i> on floor)	12 – 13 cm	7 – 11 cm

light causes glare in eyes that affects worker and the work quality. Study revealed that 92 per cent of the work place were found to have inadequate light which was much lower than the recommended level. Adequate ventilation is required for air circulation and prevention of excessive indoor temperature built-up. It also helps in removal of smoke formed from use of inefficient and low quality readily available fire-woods and improper *chullah*. It was found that 89 per cent of the work places were found to have inadequate ventilation with very small windows. Low grade fire woods were found to be used by 87 per cent of the respondents. Proper sitting height is must which otherwise affects posture and stresses the lumbar region as well as results in discomforts in upper and lower body extremities. Use of proper work methods, such as motion economy, proper reaching and work plan are must for maintaining comfort and efficiency. On the contrary it was found that 95 per cent of the respondents used lower height *pira* of 7-11 cm. Almost all the subjects were found to work in traditional *chullah* (95 %) and also some work in open fire (8%). These have low thermal efficiency, difficulty in control of fire and emit harmful particles of ashes along with smoke which are health hazardous. These also make the clothes, utensils and the workplace darker and ashy. These factors may be considered responsible for making the workers fatigue prone affecting both quality and quantity of products.

The observations under the study indicated that some conditions of physical environment was found to be non conducive for workers because of improper levels of the parameters (Table 1 and Fig. 1).

Conclusion :

Thus, it has been found that many adverse human and physical factors exist in the working environment of processing for value addition of rice mainly due to ignorance and lack of awareness towards their impact on health and

work capacity. The performance, efficiency and capacity of the workers can be enhanced with –

- Proper use of natural light and air circulation with adequate ventilation.
- Good quality fire woods and improved *chullah*.
- Proper sitting heights for floor works.
- Use of time saving tools and better work techniques.

Recommendation :

Strategies should be planned to give interventions for proper work techniques, conditions, motion economy, postural awareness, clothing, fuel use, improved *chullah*. Plantation of locally available good quality fast growing fire wood trees having high thermal efficiency can be advocated that would also help in reduction of deforestation. All these can help to enhance comfort and efficiency to derive maximum economic benefit for empowerment of rural women of Assam in particular.

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