

## A Study on Workload and Gradation of Work Heaviness in Terms of Physiological Strain for Different Tasks

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### Key Words:

Cultivation, Physiological, Human Resources, Workplace.

### Abstract:

India relies heavily on agriculture, especially the cultivation of staple crops like rice, to provide for its billion-plus population. A challenge to human resources is posed by outdoor work that is still not fully mechanised in many sectors as climate change becomes more of a reality than a possibility in the foreseeable future. As a result, a study was conducted on adult males engaged in paddy cultivation with their informed consent in order to ascertain the degree of physical strain of personnel in various tasks associated with paddy farming in relation to the thermal conditions prevailing within the open air workplace during three different times of day and across two different seasons.

### 1. Introduction

According to the 2011 census, India has a population of 1.21 billion, making up one out of every six or seven people on the earth. India occupies 2.4% of the Earth's land area, making it difficult to find enough space to grow enough food for its people on a per capita basis. The country's total land area is 328.7 million hectares. Again, the vast majority of human resources are involved in agriculture, specifically the cultivation of food crop like paddy, under the open sky without the use of a great deal of cutting-edge technology, and this is all happening in the midst of a growing onslaught from climate change.<sup>1</sup>

West Bengal is a state in eastern India, and the seasons in which rice is harvested have given rise to the names by which the state is known. In the Indian state of West Bengal, autumn or pre-kharif rice is referred to as Aus. Pre-monsoon "Aus" is cultivated in the northern part of the state from April to July, and in the southern part of the state from May to September. Aman, or winter or monsoon paddy, is cultivated between June and December. Boro refers to the paddy harvested during the summer or dry season. Summer

paddy is planted in the autumn and harvested in the spring. Sometimes the crop's growth season coincides with Aus. During the rice cultivation season, farmers have to do a wide range of tasks, some of which need to be completed on the same day. Ploughing, planting, transplanting, harvesting, threshing, and parboiling are all necessary steps in growing paddy.<sup>2-3</sup>

The major tillage job is ploughing, which is done to make the soil ready for planting seeds. It is anticipated that land value will increase permanently as a result of land levelling. The uneven field left after puddling may be smoothed up with a little assistance from levelling. For rice farming, the most popular and labor-intensive technique of crop establishment is transplanting. In the 15-40 days after sowing, paddy seedlings developed in a nursery are plucked and put onto puddle and levelled fields.<sup>4-5</sup>

Young paddy plants may be nurtured in a wet, dry, or adapted mat nursery. Transplants are either planted at random or in regular rows when done by hand. The first step in harvesting is reaping, also known as cutting. This may be done by hand or machine, depending on the crop's health and the availability of

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labour. The rice grains are physically extracted from the rice straw during the threshing process. It might be done by hand, with a pedal thresher or another thresher that relies on human labour, or with an electrically powered automated paddy thresher. Parboiling, which occurs after threshing but before milling, is crucial because it increases the paddy's nutritional value. Milled parboiled rice is produced by subjecting paddy to a hydrothermal treatment, drying it, and then milling it.<sup>6-7</sup>

## 2. Material and Methods

### Choosing Human Test Subjects:

Lucknow District were approached for participation in the study after receiving approval from institutional authorities. Only paddy cultivators who met the following criteria were included in the random selection process: they had worked in the agricultural field for at least five years, had no history of or apparent illness, worked for at least six to six and a half hours per day, and had expressed interest in participating in the study. Researchers first asked for permission to observe rice farmers doing various duties while planting paddy. After participants gave their first agreement, they were given a thorough rundown of what was expected of them. Therefore, the field research began after acquiring the necessary permission.

### Evaluation of Various Cultivation Activities for Rice:

Data from the ploughing group (PG), data from the transplanting group (TPG), data from the reaping group (RG), data from the manual threshing group (MTG), and data from the parboiling group (PBG) are all collected from paddy farmers.

### Information that must be recorded:

Participants' names, ages (in years), and ethnicities were recorded in a standardised form once informed permission was obtained. Kuppaswamy's socioeconomic scale was used to collect data on the participants' economic standing. Ravikumar et al. (2013).

An anthropometric measuring set and a weighing scale were used to determine the subject's height and weight. Height and weight were used to determine

the subject's body surface area and body mass index. Researchers also determined each participant's somatotyping score using the criteria established by Heath and Carter (1990). Hand grip dynamometer and pinch gauge were used to test grip and pinch strength in kilogrammes.

### Factors in the Environment That Can Be Measured

Hygrometers were used to take both dry bulb (TDB) and wet bulb (TWB) readings. It's been said that the shortest distance between two points is a straight line.

The natural wet bulb temperature ( $T_{nWB}$ ) was measured with a mercury-in-glass thermometer with a range of 0 to 50 degrees Celsius and 0.1 degree graduations, a cotton wick to cover the thermometer bulb, and a 200 ml conical flask filled with distilled water to serve as a reservoir, with at least 2.5 centimetres of the wick's wetted portion exposed to air. Following the usual guideline of ACGIH (2008), all equipment was delivered to the work locations no later than 15 minutes before work was to begin. After then, recordings were made while the farmers were at work.

The Vernon Globe Thermometer was used to measure the temperature throughout the world. The thermometer's bulb was centred in a metal sphere with a diameter of approximately 150 mm that was painted matt black on the exterior and into which a mercury-in-glass thermometer was placed. After waiting for the TG sensors to attain equilibrium at each location (about 25 minutes), measurements were collected. After that, they started recording it while they were out in the fields at work.

### Condition of Posture Evaluation:

Evaluation of posture: Standardised Nordic questionnaires were used to collect data on the incidence of musculoskeletal problems among paddy farmers. OWAS RULA, and REBA were utilised to evaluate the various working postures used by paddy cultivators during the manual paddy transplanting task.

Discomfort was evaluated in terms of specific body parts using the scale developed. The rice farmers were given a seven-point scale and instructed to rate

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various portions of their bodies according to the same ranking system.

## Statistical analysis:

Using the SPSS software, the acquired data were tabulated, analysed, and statistically evaluated using ANOVA, where applicable.

## 3. Results

### • Evaluation of Physical Effort Required and

## Classification of Tasks by Increasing Demand

HR peak, NCC, EEE, and CSI values, all indices of physiological strain, have been reported for both seasons in a spell-by-spell format. If you're a person who's always on the lookout for a good time, you may want to check out the local bars and clubs.

The effects of physiological stress on PG persons, measured by peak HR, NCC, EEE, and CSI, are shown in Table 1.

**Table 1:** Characteristics of cardiac reactivity in people with PG

Indicators of Physiological Strain	Working Spells during paddy cultivation					
	'Aman'			'Boro'		
	S1	S2	S3	S1	S2	S3
HR <sub>peak</sub> (beats.min <sup>-1</sup> )*	117.2 ± 1.67	138.0 ± 2.25	125.2 ± 4.12	104 ± 3.22	121.1 ± 1.17	114.0 ± 5.91
NCC (beats.min <sup>-1</sup> )*	32.2 ± 2.11	55.0 ± 2.33	41.2 ± 3.05	28.1 ± 2.01	45.5 ± 3.27	35.2 ± 3.66
EEE (kcal.min <sup>-1</sup> )*	3.46 ± 0.15	4.33 ± 0.04	3.81 ± 0.27	2.97 ± 0.15	3.65 ± 0.19	3.34 ± 0.115
CSI*	30.3 ± 1.07	46.2 ± 1.59	37.3 ± 2.52	24.0 ± 1.17	35.0 ± 3.39	29.2 ± 3.47

### PG individuals:

In the first spell (S1) of 'Aman' paddy cultivation, the HR Peak values of the PG group of farmers were in the range of 110 to 122 beats per minute, increasing to 125 to 142 beats per minute in the second spell (S2), and decreasing to 115 to 129 beats per minute in the third spell (S3). "During 'Aman' type paddy cultivation, PG individuals' values for NCC, expressed in beats.min<sup>-1</sup>, a further significant marker of physiological strain, ranged from 26 to 38 beats.min<sup>-1</sup> in the initial working spell (S1), 52 - 60 beats.min<sup>-1</sup> in the subsequent working spell, or 37 to 44 beats.min<sup>-1</sup> in the third employed spell. During the first working spell (S1), the average Indian worker's EEE was between 3.40 and 3.50 kcal.min<sup>-1</sup>; during the subsequent working spell (S2), it was between 4.27 and 4.39 kcal.min<sup>-1</sup>; and during the third working spell (S3), it was between 3.75 and 3.84 kcal.min<sup>-1</sup>. The CSI values for the S1 working spell, the S2

working spell, or the S3 working spell all fell in the range of 27 to 35."

"During the first working spell (S1) of 'Boro' type paddy farming, the HR Peak of PG group paddy farmers were found to be between 100 and 112, increasing to 118 to 128 during the subsequent working spell, and decreasing to 110 to 120 during the third work spell. During 'Boro' style paddy cultivation, the NCC varied from 25 to 35 beats.min<sup>-1</sup> during the first working spell, 42 to 50 beats.min<sup>-1</sup> during the second working spell, and 28 to 38 beats.min<sup>-1</sup> during the third working spell (S3). EEE values were from 2.93 - 3.02 kcal.min<sup>-1</sup> during S1, but increased to 3.60 to 3.70 kcal.min<sup>-1</sup> during S2 and 3.30 - 3.40 kcal.min<sup>-1</sup> during S3. In the first spell (S1) of 'Aman' paddy cultivation, the HR Peak values of the PG group of farmers were in the range of 110 to 122 beats per minute, increasing to 125 to 142 beats per minute in the second spell (S2), and decreasing to 115 to 129 beats per minute in



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the third spell (S3). During 'Aman' type paddy cultivation, PG individuals' values for NCC, expressed in beats.min-1, a further significant marker of physiological strain, ranged from 26 to 38 beats.min-1 in the initial working spell (S1), 52 - 60 beats.min-1 in the subsequent working spell, or 37 to 44 beats.min-1 in the third employed spell. During the first working spell (S1), the average Indian worker's EEE was between 3.40 and 3.50 kcal.min-1; during the subsequent working spell (S2), it was between 4.27 and 4.39 kcal.min-1; and during the third working spell (S3), it was between 3.75 and 3.84 kcal.min-1. The CSI values for the S1 working spell, the S2 working spell, or the S3 working spell all fell in the range of 27 to 35."

During the first working spell (S1) of 'Boro' type paddy farming, the HR Peak of PG group paddy farmers was found to be between 100 and 112, increasing to 118 to 128 during the subsequent working spell, and decreasing to 110 to 120 during the third work spell. During 'Boro' style

paddy cultivation, the NCC varied from 25 to 35 beats.min-1 during the first working spell, 42 to 50 beats.min-1 during the second working spell, and 28 to 38 beats.min-1 during the third working spell (S3). EEE values were from 2.93 - 3.02 kcal.min-1 during S1, but increased to 3.60 to 3.70 kcal.min-1 during S2 and 3.30 - 3.40 kcal.min-1 during S3.

## TPG individuals

The HR Peak values of paddy farmers in the TPG group ranged from 100 to 110 bpm during the first working spell (S1), 115 to 125 bpm during the second working spell (S2), and 115 to 129 bpm during the third working spell. TPG persons' NCC values during 'Aman' type paddy farming were from 23 to 31 beats.min-1 during S1, and from 40 - 51 beats.min-1 during S2 and S3, respectively. Indicators of physiological stress include NCC as well. In the first working spell, EEE values assessed physiological strain by ranging from 2.90 to 3.00 kcal.min-1, 3.59 to 3.67 kcal.min-1 in the second, and 3.18 - 3.30 kcal.min-1 in the third.

**Table 2:** Cardiovascular reactivity in the TPG population

Indicators of Physiological Strain	Working Spells during paddy cultivation					
	'Aman'			'Boro'		
	S1	S2	S3	S1	S2	S3
HR peak	104.2 ± 3.99	121.0 ± 2.48	112.0 ± 3.19	97.0 ± 1.70	114.2 ± 2.57	104.4 ± 2.16
NCC	27.0 ± 4.16	44.2 ± 3.10	35.0 ± 2.19	24.5 ± 3.63	34.2 ± 2.91	29.2 ± 3.16
EEE	2.98 ± 0.22	3.63 ± 0.13	3.25 ± 0.19	2.72 ± 0.15	3.68 ± 0.11	3.23 ± 0.23
CSI*	29.2 ± 2.82	43.0 ± 2.15	36.2 ± 3.71	25.5 ± 2.91	37.4 ± 2.09	31.0 ± 4.13

Paddy farmers in the TPG group had HR Peak values ranging from 92 to 104 beats per minute during the first working spell (S1) of 'Boro' style paddy cultivation, and from 110 to 120 beats per minute during the second and third working spells (S2) and S3, respectively. "TPG individuals' NCC values during Boro' type paddy cultivation ranged from 20 to 27 beats.min-1 during the first working spell (S1), 30 to 39 beats.min-1 during the second working spell (S2), and 25 to 35 beats.min-1 during the third working spell (S3). During the first shift, EEE values were discovered to range from 2.93 to 3.02 kcal.min-1."

S1 working period, and between 3.59 and 3.69 kcal.min-1 and 3.20 and 3.30 kcal.min-1 during S2 and S3, respectively.

## RG individuals

Paddy farmers in the RG group had HR Peak values of 100 to 110 beats per minute (BPM) during the first working spell (S1) of 'Aman' style paddy cultivation, but these values increased to 119 to 129 BPM (BPM) and 111 to 120 BPM (BPM) during the second and third working spells (S2 and S3, respectively) of

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paddy farming. During the first working spell (S1), RG individuals' NCC values ranged from 30 to 39 beats.min<sup>-1</sup>, while those in the second and third working spells (S2 and S3) ranged from 39 to 49 beats.min<sup>-1</sup> and 35 to 44 beats.min<sup>-1</sup>, respectively.

During the first working period (S1), EEE values were from 2.96 to 3.07 kcal.min<sup>-1</sup>, whereas during S2 and S3, they ranged from 3.92 to 4.04 kcal.min<sup>-1</sup> and 3.50 to 3.60 kcal.min<sup>-1</sup>, respectively.

**Table 3:** Heart rate variability in RG people

Indicators of Physiological Strain	Working Spells during paddy cultivation					
	'Aman'			'Boro'		
	S1	S2	S3	S1	S2	S3
<b>HR<sub>peak</sub> (beats.min<sup>-1</sup>)*</b>	106.6 ± 3.36	126.4 ± 2.78	116.1 ± 3.88	120.2 ± 2.71	131.0 ± 3.47	125.4 ± 4.38
<b>NCC (beats.min<sup>-1</sup>)*</b>	35.0 ± 3.37	45.4 ± 5.11	39.2 ± 4.51	37.6 ± 3.21	52.2 ± 4.08	42.2 ± 5.11
<b>EEE (kcal.min<sup>-1</sup>)*</b>	3.02 ± 0.11	3.95 ± 0.27	3.55 ± 0.19	3.17 ± 0.14	4.76 ± 0.07	3.64 ± 0.22
<b>CSI*</b>	32.9 ± 2.97	45.1 ± 3.32	37.5 ± 5.40	38.3 ± 2.47	55.2 ± 2.11	43.0 ± 3.15

"Paddy farmers in the RG group were found to have HR Peak values of 115–125 beats.min<sup>-1</sup> in the first working spell, 127–136 beats.min<sup>-1</sup> in the second working spell, & 121–130 beats.min<sup>-1</sup> in the third working spell (S3) at the time of year when Boro' type paddy is cultivated. During the first working spell (S1), the average NCC for RG people doing 'Boro' type paddy farming was between 30 and 40 beats.min<sup>-1</sup>; during the second working spell, it was between 47 and 56 beats.min<sup>-1</sup>; and during the third working spell it was between 38 and 49 beats.min<sup>-1</sup>. During the first working spell, EEE values were reported to be between 3.14 and 3.22 kcal.min<sup>-1</sup>, whereas during the subsequent working spell, they

were between 4.73 and 4.84 kcal.min<sup>-1</sup>, and during the third working spell, they were between 3.60 and 3.69 kcal.min<sup>-1</sup>."

- Examining How Various Groups Fared On The Drudgery Indicator As Their Workdays Progressed**

Work that causes mental and physical exhaustion, boredom, and stress is often referred to as drudgery. Workers who grow our food undergo significant physical stress from the variety of duties they do. They are probably ignoring their health since they have so much to do on the farm and at home.

**Table 4:** Participants' Dreariness Index

Groups	Working Spells during paddy cultivation					
	'Aman'			'Boro'		
	S1	S2	S3	S1	S2	S3
<b>PG*</b>	45 ± 2.14	60 ± 2.34	52 ± 2.47	35 ± 3.39	51 ± 3.34	41 ± 3.79
<b>TPG*</b>	39 ± 2.19	52 ± 3.31	45 ± 3.35	34 ± 3.57	49 ± 4.11	40 ± 4.01
<b>RG*</b>	35 ± 4.17	57 ± 3.67	44 ± 4.15	42 ± 3.11	61 ± 3.30	53 ± 3.61

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## PG individuals

For the 'Aman' method of paddy cultivation, the drudgery index value ranged from 39 to 49 in the first working spell (S1), 56 to 67 in the second working spell (S2), and 47 to 57 in the third working spell (S3) among PG group paddy cultivators.

Paddy farmers in the PG group reported drudgery index values between 31 and 41 in the first working spell (S1), 42 to 52 in the second working spell (S2), and 35 to 45 in the third working spell (S3) when cultivating paddy in the 'Boro' style.

## TPG individuals

The 'Aman' method of growing rice: The drudgery index ranged from 34 to 44 during the first working spell (S1), 44 to 55 during the second working spell (S2), and 42 to 52 during the third working spell (S3) while performing the manual transplanting job.

Paddy farmers in the TPG group reported drudgery index values between 30 and 41 in the first working spell (S1), 44 to 56 in the second working spell (S2), and 36 to 45 in the third working spell (S3) when cultivating paddy in the 'Boro' style.

## RG individuals

The drudgery index ranged from 31 to 42 points during the manual reaping labour in the first working spell (S1), 53 to 63 points in the second working spell (S2), and 40 to 50 points in the third working spell (S3) of 'Aman' paddy cultivation.

The drudgery index ranged from 36 to 46 in the first working spell (S1), 56 to 66 in the second working spell (S2), and 50 to 57 in the third working spell (S3) among RG group paddy cultivators who grew rice using the 'Boro' method.

**Table 5:** HPDI score of the study participants

Groups	Working Spells					
	'Aman'			'Boro'		
	S1	S2	S3	S1	S2	S3
<b>PG*</b>	64 ± 5.11	79 ± 3.15	71 ± 3.19	59 ± 2.15	72 ± 2.19	64 ± 3.51
<b>TPG*</b>	62 ± 5.15	72 ± 3.19	68 ± 4.15	56 ± 3.55	69 ± 4.67	64 ± 2.97
<b>RG*</b>	61 ± 3.15	75 ± 3.61	69 ± 3.67	65 ± 3.21	80 ± 5.45	72 ± 4.12

## PG individuals

For the 'Aman' method of paddy cultivation, the HPDI value ranged from 62 to 69 in the first working spell (S1), 75 to 84 in the second working spell (S2), and 67 to 74 in the third working spell (S3) among PG group paddy cultivators.

For the 'Boro' method of paddy cultivation, it was discovered that the HPDI value ranged from 55 to 63 in the first working spell (S1), 68 to 76 in the second working spell (S2), and 60 to 69 in the third working spell (S3) among PG group paddy cultivators.

## TPG individuals

The human physical drudgery index value for the manual transplanting job in 'Aman' style paddy farming ranged from 58 to 66 in the first working spell (S1), 68 to 76 in the second working spell (S2), and 64 to 72 in the third working spell (S3).

Paddy farmers in the TPG group had HPDI values that ranged from 52 to 60 during the first working spell (S1), 65 to 73 during the second working spell (S2), and 60 to 68 during the third working spell (S3) when they practised the 'Boro' method of paddy cultivation.

## RG individuals

The HPDI ranged from 57 to 65 during manual reaping in the first working spell (S1), 71 to 79 in the

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second working spell (S2), and 65 to 73 in the third working spell (S3) for 'Aman' type paddy farming.

Paddy farmers in the RG group were found to have HPDI values that ranged from 61 to 69 during the first working spell (S1), 76 to 86 during the second working spell (S2), and 68 to 76 during the third working spell (S3) when they practised the 'Boro' method of paddy cultivation.

## • Workload Distribution Analysis across Shifts

How much of a toll your workout had on your body by measuring your heart rate (HR) at its peak, your NCC, and your EEE. A scale from "light" to "moderate" to "heavy" etc. was used to describe the burden. Workload intensity during 'Boro' style paddy farming has been rated as moderate, according to three measures of HR peak, NCC, and EEE. The workload during the S2 working session was classified as "heavy," "rather heavy," and "moderate" based on three measures of physiological stress: heart rate peak, nitrogen consumption rate, and energy exerted per hour. Workload in the S3 shift has been rated as "heavy" in terms of HR peak, "moderate" in terms of NCC, and "moderate" in

terms of EEE. The results of this investigation were consistent with those of a previous study conducted on male paddy farmers in West Bengal while they were ploughing.

"The workload in the S1 working period for TPG people during the Aman' kind of paddy growing season has been rated as "moderate," "quite moderate," and "moderate" according to three indicators: HR peak, NCC, and EEE. The HR peak, NCC, and EEE ratings during the S2 working period were "heavy," "rather heavy," and "moderate," respectively." The workload during the S3 working time was rated as "heavy" by HR peak, "quite moderate" by NCC, and "moderate" by EEE. It has been determined that the workload during Boro' type paddy growing period is moderate, fairly moderate, and moderate according to the three indicators of HR peak, NCC, and EEE. "HR peak, NCC, and EEE were used to categorise the level of physical exertion during the S2 work period, with "heavy," "moderate," and "moderate" respectively. In terms of HR peak, NCC, and EEE, the workload during the S3 working phase was rated as "moderate," "quite moderate," and "moderate"

**Table 6:** Analysis of workload in terms of physiological strain markers throughout shifts

Indicators of physiological strain			PG				TPG				RG			
			HR peak	CSI	NCC	EEE	HR peak	EEE	NCC	CSI	HR peak	EEE	NCC	CSI
Working Spells	'Aman'	S1	H		M	M	M	M	QM		M	M	M	
		S2	VH	Strain	H	H	H	M	RH	Strain	H	M	RH	Strain
		S3	H	Strain	RH	M	H	M	QM	Strain	H	M	M	Strain
	'Boro'	S1	M		QM	M	M	M	QM		H	M	M	Strain
		S2	H		RH	M	H	M	M		VH	H	H	Strain
		S3	H		M	M	M	M	QM		H	M	RH	Strain



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## 4. Discussions:

Three indicators of physiological stress were shown to vary significantly ( $P < 0.05$ ) between the 5 groups. "There is a difference that is statistically significant ( $P < 0.01$ ) between the values of indicators of physiological strain in all three working signifies between the PG and TPG groups during Aman' and Boro' type paddy cultivation, as determined by a post hoc analysis. During the Aman' and Boro' kind of paddy growing period, there is no statistically significant difference ( $P > 0.05$ ) among NCC in S3 working spell and EEE in S2 working spell." <sup>8-9</sup>

For HR peak and EEE in S1 and S3 working spells during the 'Aman' kind of rice cultivating time, as well as HR peak and NCC in S2 working spells during the 'Boro' type of paddy cultivating time, there is no statistically significant differences ( $P > 0.05$ ) between RG and MTG." The remaining indicators all reached statistical significance ( $P < 0.01$ ) except for NCC in the S2 work period during 'Aman' type of cropping season ( $P < 0.05$ ). <sup>10-11</sup>

There is a statistically significant ( $P < 0.01$ ) disparity between RG and PBG in all cases. However, the S1 working duration during the Boro' kind of rice cropping time does not vary significantly ( $P > 0.05$ ).

The results of this research supported the findings of a previous study done on male rice growers in West Bengal, India, who did physical ploughing as part of their profession and whose efforts were rewarded with a promotion. This study compared the heart rates & oxygen consumption rates of paddy farmers while they were working to the findings of prior studies on the subject. The findings of the new investigation are consistent with those of the earlier study. Similar findings were reported in a prior study on energy use among Odisha's rice farmers when transplanting. <sup>12-13</sup> This study compared the peak heart rates and total energy expenditures of rice farmers during manual paddy threshing to those of prior studies. The findings of this study backed with those of other studies when volunteers manually threshed rice. Previous studies conducted among Assamese food crop growers confirmed the predicted energy expenditure values during the manual parboiling activity found in the present study. The findings of this study are in perfect accord with those of a prior study among Assamese

farmers that focused on the production of food crops. <sup>14-15</sup>

## 5. Conclusion

Agricultural labour, namely rice farming, is physically demanding and may have negative effects on human health; manual ploughing and threshing are even more taxing, as shown by signs of physiological strain. In addition, the heat indices have determined that the ambient temperature is high, much over the threshold levels at which human resources should be working. primary activities include physical ploughing and transplanting for growing the "Aman" kind of paddy. Manual labour such as reaping, threshing, and parboiling during the "Boro" kind of rice cultivation period are taxing and may have negative effects on human resources' health. Furthermore, manual threshing duties are more taxing, as shown by signs of the physiological strain.

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