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## RICE CULTURE IN KASHMIR; GENESIS AND TECHNOLOGY



Abdul Waheed Bhat

### ABSTRACT

Rice is the most popular food crop of Kashmir. It has been described as 'the only hope of people's existence'. This article seeks to trace the genesis of this important crop and locate the time of its introduction, forces that promoted it and probable centers where from it traveled to Kashmir. The technology applied to raise rice is also covered in detail. So far as methodology to build up this paper is concerned, besides profuse primary & secondary written sources, we have taken help from strong archeological evidences, field work and participant observation. No less help has been taken from other disciplines by adopting interdisciplinary approach.

**KEYWORDS** :Rice. Irrigation. Agriculture. Food. Village. Hunger. Diffusion.

### INTRODUCTION

Diffusion of crops is an interesting chapter of human history. Kashmir presents a good example of this process. The crop culture that has evolved in Kashmir with the passage of time has a long history and its origin is rooted in the neighbouring areas as well as in the regions that are far from it. It is important to mention here that right from the day cultivation of crops started in Kashmir, the inhabitants tried every effort to domesticate as many crops as possible and experimented all available land forms to make the optimum use of land. For this purpose land reclamation was undertaken on large scale and seeds were brought from the regions bearing climatic resemblance with Kashmir.<sup>1</sup> The sole purpose was to achieve self sufficiency in food production so that there is no fear of starvation. Crops were in fact introduced to pile enormous masses of food to save life.<sup>2</sup> Besides, there were a

number of other factors that enriched and promoted the crops wealth cultivated in Kashmir. Given the geographical setting, Kashmir is bordered by great civilizations that evolved in India, China and Central Asia. And as a matter of fact this Himalayan valley, despite challenging terrain and isolated character, has always remained in close contact and continues engagement with its civilizational neighbourhood. This intimacy with the world beyond mountains had progressive impact at different levels. Agriculture, the main base of economy too was benefited from this interaction and exchange. The food that is taken and the crops that are cultivated are material evidences of cross cultural influences that Kashmir nourished with its neighbours though out past. It is perhaps because of these influences that made an observer to write:

‘The countless orchards of apples, pears, and apricot give the valley the appearance of a well-wooded park. There is a curious mixture of the east and west. The crops are eastern, but the rounded forms of the trees, the rivers and the streams with their banks of green turf, and willows recall the west’.<sup>3</sup>

### RICE, THE GREAT STAPLE OF AGRICULTURE

Of all the crops cultivated in Kashmir it is rice that occupied larger acreage of land and vast attention of the cultivators. It was the major food plant among all the crops cultivated in Kashmir. It is believed that the origin of rice lies in Southern Asia, east India and China.<sup>4</sup> The earliest archeological evidence of rice comes from Non Nok Tha in Thailand, where it dates back to 3500 BC.<sup>5</sup> It was known to Chinese around -3000.<sup>6</sup> In India the history of rice goes back to the Harrapan Civilization. Impression of spike-lets on potsherds has been reported from Lothal in Gujarat.<sup>7</sup>

### EARLIEST EVIDENCES OF RICE IN KASHMIR

In Kashmir the evidences of the cultivation of rice dates back to three and a half millennium years back. Charred grains of rice have been recovered from the famous Kashmir Neolithic site of Semthan in Anantnag dating around 1500 BC.<sup>8</sup> Rice appears at another noted Neolithic site of Gofkral Pulwama towards the end of the second phase datable to -1000 BC.<sup>9</sup> Evidences of rice from the megalithic site at Burzohom near Srinagar are 1000 BC old.<sup>10</sup> It means that by this time rice had become popular food in Kashmir in almost all habitated areas known to settlers.

What were the probable centers where from this crop traveled to Kashmir? Before this question is addressed it is pertinent to mention here that Kashmir falls close to the established centers of this crop. India and China are two known places where from rice spread to different parts of the world. In so far as Kashmir is concerned it is beyond doubt that it is from these two regions that Kashmir adopted rice culture and framed its soil to the requirements of the technology needed for paddy cultivation. The impact of these two regions on the crop cultivation in Kashmir is enormous. Some times it is hard to give primacy to any region in terms of its contribution to the evolution of crop wealth cultivated in Kashmir. For example take the instance of rice itself. Its various varieties have names that resemble with India as well as China. Same crop seems to have been contributed by both regions at different periods of time. So who then initiated first. This is resolved by the available earliest evidence of the crop in the respective region. In so far this parameter is concerned evidences favour China as the most possible early contributor of rice in Kashmir. It is believed that the Neolithic farmer of Kashmir seems to have been largely inspired to grow rice under the Chinese influence. Archaeological finds, the main source that help in situating the history of rice in Kashmir, support this opinion. People from archeology are of the view that rice came to Kashmir from china. While elaborating their point of view they write:

‘As is detectable from the archaeological record of Gofkral (period IC and II) as well as from

Burzohom (period III), the crop was raised between 2000-1700BC. The fact that the people seem to have not built any contact with the Indian rice cultivation sites suggests an outside origin for the Kashmir variety. The source of its introduction was south-east Chinese sites of the Lung Shan period, for two obvious reasons; one that the two specific wild varieties of cultivated rice were largely distributed in east Asia including China, and secondly at this period of time the people of Kashmir seems to have had built cultural contacts with the Lung Shan people of China.<sup>11</sup> The Chinese contacts seem dominant elsewhere also. The tools like harvester which has been found at many Neolithic sites of the Yang Shao and the Lung Shan in China bear close resemblance with the harvester that appeared in Kashmir for the first time around 2000 BC at Gofkral.<sup>12</sup>

It is no less interesting to know that millets such as broom corn and foxtail locally known as ping & shool are the earliest crops cultivated in Kashmir, whose evidences are available from neolithic times.<sup>13</sup> These are dry crops and don't need irrigation like rice cultivation. Broom corn is called ping in China. The local name of this millet closely resemble with Chinese name which presupposes its Chinese origin.<sup>14</sup>

### SHIFT TO RICE CROP

The spread of rice culture within Kashmir is an interesting chapter of land-man relationship. Kashmir possess a charming geography. However it may be added here that the land form is challenging. It lack uniformity. There is so much dissimilarity that it is almost impossible to locate a two or a single square kilometres patch of plain piece of land in any part of Kashmir. This has always posed a hurdle for the cultivators to develop a crop that covers the whole valley. The various crops raised in Kashmir reflect the complexities in the geographical composition of the land. This is true of the major crop of rice as well. No single seed variety of rice was ever cultivated in all Kashmir. Climatic conditions didn't allow that. This is perhaps the major reason that in a small country like Kashmir which has tremendous gravitational irrigation possibilities, rice spread gradually from area to area after irrigation was made available, land was reclaimed and seed required had a successful growth. This took not less than three and a half thousands years.<sup>15</sup>

Given these practical difficulties the propagation of rice culture in Kashmir seems to have passed through various stages. In the first stage land falling on the fringes of vastly available marshes (nambals) was brought under rice cultivation. This was because irrigation was available. Other technological requirements like plough had already found its presence.<sup>16</sup> Rice culture evolved on same lines in other regions also.<sup>17</sup> However, this was a preliminary phase and it had its own limitations. It could not be expanded and was prone to floods. Rice cultivation on major scale started only after the waters of the streams coming from the mountains were canalized and inclined terrain was terraced into fields for the retention of water. These were necessary prerequisites for the popularity of rice culture in Kashmir. So far as evidences, both archeological as well as written, are concerned south Kashmir [Madivaraja] witnessed the beginning of rice cultivation in Kashmir. As per recorded evidences this process started centuries before Christian era. Raja Suvarna who initiated the canalization on the scientific principles of gravitational flow is mentioned in Rajatarangini among the earliest known rulers of Kashmir.<sup>18</sup>

What circumstances led to the promotion of rice cultivation in Kashmir? which not only involved sowing and harvesting but needed the reclamation of land, regular supervision, management of water resources and rearing cattle for traction of land and manure. Another major difficulty involved in it was the change of food habit. All these things presuppose that some important factors led to the popularity of rice culture in the agricultural history of Kashmir. One thing is however clear that once rice

was introduced in Kashmir it surpassed all other existing and arriving crops and forged a strong blend with the food habits of the people which still continues.

It may be mentioned here that game and gathering were main sources of food in prehistoric Kashmir. Later, cultivation of cereals such as wheat and barley were introduced to strengthen food security. Till this arrangement sufficed the food requirement of the people, there was hardly any need to look for alternative crops. But once the population increased, more demand for food arose. The existing crop pattern and other food sources succumbed before the new situation. It may be added here that the scope of these earlier crops was also limited in Kashmir. The vast karewas were hardly plain. They were characterized by slope and steep. It was very hard and laborious to till the steep soil with the technology available. No small hurdle was the nature of soil. The karewa soil has proverbial hardness. It is very hard to raise cereals on karewa soil. It cakes quickly, retains less moisture and in times of draught or non availability of water there is every possibility of crop failure. Besides, the lower areas had perpetual threat of floods and the upper areas were less fertile as no artificial source of manuring seems to have been operative.<sup>19</sup> Needless to emphasize that wheat is already less productive than rice.<sup>20</sup> This might have also played its role. Simultaneously the urge to avoid 'come and go' was also a strong factor that needed alternate arrangement. It is pertinent to mention here that Kashmir was inhabited seasonably in the remote past.<sup>21</sup> People spent only that period which suited their requirement.

It may be mentioned here that no society can afford to take risks with its survival. For survival it always tries to be on the safe side. Insured food sources are basic to survival and agriculture is the best ensured source of food. However the promotion of a crop that a cultivator grows is subject to the favourable climatic conditions. In Kashmir other than rice, all other crops were rain dependent and sky seldom rained as per crop requirement. With the result people always lived in perpetual threat of hunger and scarcity. This led them to search such a crop that was more reliable and rice provided perfect solution to their requirement.

Let us see first why wheat and barley which were cultivated in the beginning were not continued with? The facts which prevented either of these crops being largely produced in the valley were many. For a clear understanding let us quote an observer who keenly observed agriculture in Kashmir for five consecutive years. He writes:

I have seen five spring harvest in Kashmir. The first was destroyed by heavy rains in the early spring, immediately followed by intense heat and dryness; the second was ruined by want of winter rains; the third was lost by the snows lying long into the spring, when they melted under a burst of hot weather which caked the soil and nipped the young wheat and barley plants; the fourth failed by the absence of either winter or spring rains; and the last was spoiled by the snow lying too late, and by the excessive spring rains. The Kashmiris do not care for barley or wheat as a food.<sup>22</sup>

### **The other factors that favoured the rice cultivation were:**

- a). In the one crop economy of Kashmir wheat cultivation left no scope for other crops as it occupied fields from October to June. Where as rice made possible to raise other crops like wheat for fodder purpose. Even rapeseed could be easily cultivated between the period of harvesting and sowing. Which comprise of almost seven months with ideal climate for rapeseed cultivation.
- b). Climatic process in valley suited rice. The spring started the inflorescence of plants, activated environment as well as inmates, people after a long spell of indoor life had the best activity to opt for. Summer provided them opportunity to look after crop, autumn the ideal season to harvest and storage the provision for harsh winters. Other crops available had reverse procedure.

- c). Wheat suffered from diseases.
- d). Wheat fields were swarmed by rats that damaged the crop. This was not the case with rice. Water acted as a natural deterrent from rodents. That is why as late as mid-twentieth century cultivators in areas like Sonawari opted for rice cultivation as state made the required irrigation facility available.
- e). Rice had so many varieties which suited diverse climatic situations of Kashmir.
- f). It could be cultivated nearer mountains also.
- g). Rice had an additional quality. Besides producing food for human population and cattle, it produced raw material for a number of crafts. These included thatched roofs, ropes, footwear, furnishing and sacks (yaethren).

The curiosity to make optimum use of available land resources and create a sustainable surviving mechanism ultimately prepared society to search for some more suitable crop and that crop was rice. Rice suited to the geographical conditions of Kashmir. It had promising scope. Rice is an aquatic crop. It required water and water was available in abundance. Just kuhls needed to be carved out on the already favourable sloping terrain. In cultivating rice man was more in commanding position to procure food from soil. It was given to all these circumstances that rice was naturalized in Kashmir. The process of the diffusion of rice cultivation in Kashmir was further accelerated by the fact that the crop was already domesticated in the bordering areas of Kashmir. And Kashmir had close cultural contacts and these contacts served channels of give and take.

Where was the new crop cultivated initially? It looks that the fringes of marshy land was experimented first. It is not surprising to find the evolution of rice cultivation preceding on parallel lines in other cultures also.<sup>23</sup> The spread of rice cultivation to upper areas known for uneven terrain and karewas, has a late beginning. It was subject to the harnessing of fast flowing mountain streams which only an organized community could do. These areas were brought under rice culture gradually at different periods of history. Especially in the periods when there was a central authority which executed the required infrastructure indispensable for such a monolithic crop which covered almost all land worth agriculture.

Rice enjoyed central importance in the crop culture of Kashmir since its very inception. All other cereals like wheat, barley or maize were supplementary crops raised only when or where rice was not possible. Of the data available about the year 1889-90 it is clear that rice alone covered as much land as maize, barley and wheat together. Of the total 492,117 acres under cultivation, rice was grown on 189,352 acres, maize on 130,644 acres, barley on 30,103 acres and wheat on 29,840 acres respectively.<sup>24</sup>

### Varieties of rice

Numerous varieties of rice were cultivated in Kashmir. These varieties were easily identified by the cultivators.<sup>25</sup> Sometimes in a single district not less than fifty three varieties were cultivated.<sup>26</sup> In some sources varieties of rice cultivated in Kashmir numbered ninety six.<sup>27</sup> However when we counted these local traces from different sources they cross over a hundred. These varieties included red rice, white rice, fragrant rice, long eared, medium sized, awn as well as awnless.<sup>28</sup> To make the rice culture broad based so that it suits expected climatic challenges and diverse land forms of Kashmir different varieties were introduced at different periods of history. That is why we find a long list of rice varieties imported from other regions. Varieties like sukhdas, kuver, and basmati were also cultivated in other parts of India such as Oudh, Burhanpur and Vijayanagar empire.<sup>29</sup> These varieties came to Kashmir with the passage of time.

Certain villages were famous for their peculiar rice varieties. Telbal on the Dal lake was noted for its soft white chughal, qasba Lal for its anzan, Salora near Ganderbal for its gudh krihun'.<sup>30</sup> The cultivators made a wise selection of the rice and choose only that which was suitable for their area. It is not out of place to mention here that hardly any rice variety was cultivated throughout Kashmir because geographical constraints did not allow that. We find a sort of selection of rice varieties in terms of climatic zones and land forms. For instance niver & kanvol was adaptive to the cold climate. They thrived in areas close to the mountains.<sup>31</sup> Yatal was suitable for the swampy lands where harvesting commenced late due to the presence of water in the fields and it had the qualities to remain standing for long period.<sup>32</sup> Yatal neither broke in the middle by the weight of ears nor lodged on mud by winds. Variety like gud vozul was an emergency one. It ripened in short span of time and was cultivated mainly when irrigation was delayed. Where the cold water from the mountains first entered the rice fields the red rice was grown, because the white rice did not stand the chill of the irrigation. As one ascended the slopes of the Kashmir valley the chief variety of rice grown was the niwar, a plant of short stout growth, which yielded hard red rice, very sweet and nourishing.<sup>33</sup>

### Pattern of Rice Cultivation

'I do not think that the Kashmiri has much to learn in rice cultivation, or that he can be fairly blamed for growing inferior varieties of rice.'<sup>34</sup> 'For rice' writes Lawrence, 'he [cultivator] will terrace his fields, expend great labour in digging out irrigation channels, spend his nights out in the fields watching the flow of water, and will pass laborious days moving about like an amphibious animal in the wet deep mud.'<sup>35</sup>

Rice related agricultural activities are so intermingled and contemporaneous that one feels handicapped to draw a clear cut line between one activity and the other. As a matter of fact preparation for the cultivation of rice commenced with the harvest of paddy. The cultivators first of all made the selection of seed [biol] for the next year. For that matter he selected only that field where they are confident about the quality of grain. Rice varieties, it may be mentioned here, differed in their growth pattern. Some varieties ripened early and some ripened late. Till the long duration varieties were harvested, the short duration one broke in the middle. Harvesting therefore proved problematic if a diluted seed was used. Besides, the paddy preserved as seed was supposed to be ripe, mature and without weeds. After threshing paddy the seed was stored separately in earthen silos (loopun) or grass sacks [yatrín].<sup>36</sup> Earthen silos were fire proof and grass sacks kept the seeds pure, safe and separate. These methods of storage testify the value of seeds which were earmarked in the initial stage. 'Great care is used in the selection of seed, and the seed grain is jealously put away after harvest in grass sacks. Nothing but the direst necessity would induce a Kashmiri to break in upon his seed store for food.'<sup>37</sup>

It was the wet system of rice cultivation that prevailed in Kashmir all along its history. Both transplant and broadcasting techniques of rice cultivation were in practice. However it was the broadcasting system that was much popular and transplantation, though known earlier times also, was adopted on large scale in the second half of the twentieth century.<sup>38</sup>

### Manures

Before different stages of rice cultivation are covered, it is must to throw some light on the manures used to rejuvenate the soil for rice cultivation. Manures were considered very important for crops. It was said that cultivate only that much land for which manure was possible. Manure served as status symbol in agrarian society in Kashmir.<sup>39</sup> Different types of manures like cattle dung, silt, turf clods, poultry dropping, ash and night soil were used for rice crop.<sup>40</sup>

### Methods of preparing land; dry-tao and wet- kunil

There were two different methods of preparing land for rice cultivation in Kashmir. They were tao and kunil. The former was common in the terraced land and the latter in the lower areas. In the tao land was ploughed in dry condition. The first ploughing (vobi, vakdi) was followed by crashing clods by mallets. The process was repeated after the second ploughing if clods again remained. In certain areas an ox-drawn clod crusher (mund) was rolled on the soil to crack clods, smooth soil and block rodent holes so that water do not leak from the field.<sup>41</sup> When the soil was bone dry<sup>42</sup> water was directed to the fields and soil turned into soft mud. In case there were clods those were broken by feet (lutvoun). Finally the field was smoothed by a harrow. Ploughing tao was believed to yield more crops because in soft mud root development was quick and therefore plants gathered more nutrients which increased the growth of the main crop. Besides it was easy to weed in the soft mud. Keinul plowing was confined to the swampy water logged areas of low lying region. In this system the land was prepared in wet condition.

Rice land was ploughed three to four times. More plowing was generally favoured. The cultivators believed that more plowing increase production.<sup>43</sup> [aalun chhu flaul]. Plowing ran in a sequence. Unless the first plowing did not end second was not commenced. The land submerged in water had some peculiar techniques of plowing. Since it was very hard for a ploughman to regulate evenly the furrows in water, he therefore, fixed sticks (tsip koiun) in the direction of furrow so that land was evenly ploughed. At every turn he shifted those sticks and managed the proper tillage of the field. Further the position of traction animal was daily changed from one side to another. For this purpose a mud mark was put on the thighs of bullocks daily. Plowing continued till three o'clock. Before bullocks were left free they were washed. Side by side plowing, the boundaries of the fields were mended, reshaped if required or pasted with mud to turn them water proof. Rodents did damage to these boundaries. The boundaries were almost six to twelve inches wide. Preparation of land ended with the harrowing of fields.

In the lower parts where water used to be stagnant & comparatively warmer than upper parts, rice cultivation was marked by the eruption of khaz. Khaz was a microbe that flourished in stagnant warm water. Red pustules appeared on legs and right arm. They caused acute irritation. The peasant protected themselves from khaz by pine pitch. It was rubbed on legs and arms. It stuck with skin and lasted for full day. A new coat was applied every day till weeding was completed.<sup>44</sup> After weeding the layer of pine pitch was removed by oil.<sup>45</sup>

### Broadcasting method of cultivation (wouttur)

Wouttur was the most common method of paddy cultivation in Kashmir. It is still practiced in India<sup>46</sup> and was also in practice in China.<sup>47</sup> The cause of its prevalence was not merely the legacy of past or the ignorance of peasants about transplantation but there were other factors that made it the common choice of rice cultivation for the peasants. In view of the cold geographical conditions of Kashmir, snow is expected up to May and temperature normally remains low, the cultivator did not take cudgels of crop failure by sowing the seeds earlier. They delayed the sowing operation to the improved weather conditions and that was possible by broadcasting method only. It is worth to mention here that broadcasting and transplantation methods had about a month's gap. And this meant a big difference in the spring to summer shift in the often changing climatic conditions of Kashmir. No less important factor was the shortage of man power. Lawrence had rightly observed that less population was a major cause of agriculture backwardness in Kashmir.<sup>48</sup> The choice of crop cultivation technique is largely determined by the available human resource. Since the labour supply was deficient the cultivators

opted for broadcasting technique. No doubt broadcasting was a back breaking method but the initial stage such as preparing of land and sowing were completed by the minimum workforce. The labour consuming stages of weeding and harvesting were compensated by the involvement of animals such as oxen and long harvests which were characteristic features of this system. Broadcasting method had another attraction for peasants. They believed that through broadcasting method rice produced best seed. This was so important for peasants that even after the shift to transplantation method the seeds were procured from broadcasted rice.<sup>49</sup>

The preparation of land for cultivation and seed quantity in wouttru was same as in transplantation but the time and method of sowing and the weeding markedly varied. All paddy land was first ploughed and kept ready for seeds. By the ending of May broadcasting of seeds started with the ratio of eighty kg per khar. The seeds settled on mud. To avoid the bird damage as they picked seeds puddling was done so that seeds were covered by mud.<sup>50</sup>

Contrary to the nursery method of cultivation, the fields were not drained or dried in broadcasting method in the initial stage. Rather seeds were sprinkled in the well ploughed water logged fields. The seeds were sprinkled by hand. In spreading seeds by hand some portions received large and some portions received less seeds. As soon as plants attained some height, spacing (gudrou) started. Rice clumps were dibbled in those portions having received minimum seeds. In such cases where a field was densely seeded the plants were spaced by a sort of ploughing (sel). In such plowing, continuous furrows were not made but a gap was left in between the furrows.<sup>51</sup> For successful broadcast cultivation the fields should have been fairly large, and water must have been available at the right time, and the supply should have been ample.<sup>52</sup>

### **Transplantation method of rice cultivation (tropia, thal dranthien)**

Transplantation is a latter method of rice cultivation. The technique was originally developed in Chinese.<sup>53</sup> At present it is the only popular method of rice cultivation in Kashmir. This method is marked by selection of seedlings rather than sowing the paddy in the fields directly. In the month of April the cultivators started preparations for rice cultivation. The first thing to do was to get the seeds from the earthen silos for pre-germination. The seed was dried, winnowed and packed in big bowls. The bowls were kept full of water. This stage lasted for four days or till the grains were fully moisturized. The surplus water was poured out and the seeds started germinating.

If it happened to be cold the bowls were shifted to warmer place like cattle sheds for quick germination. Meanwhile preparation of the nursery remained in progress. Nursery was a serious matter. All aspects like its location, its soil, its immunity from weeds, and the manures to be used were taken into consideration. Nursery was generally arranged in close proximity to the fields. Soft and sandy soil was considered ideal for nursery. Nursery needed to be fertile and it was adequately manured by very potent fertilizers. Ash, barnyard and sheep tails formed the main manures which were applied prior to plowing and mixed with the soil subsequently. Nursery was thoroughly ploughed for two to three times and finally leveled by a rake. Prior to spreading seeds nursery was thoroughly cleaned of grass stumps and other residue that find place with manures. The earthen or mud clots were pressed and pieced into soft substance. At the completion of this crucial stage, cultivators prepared a special food known as taheir and distributed it at local shrines or public places. Some rice from seed portion was roasted and taken fondly. It was called baiel tumul.<sup>54</sup>

Rice was generally transplanted from nursery after forty days or sometimes a few days earlier. The propagation of rice plants proceeded randomly and no lining was maintained. The size of the clumps was conditional to the level of water. Plants planted in shallow water produced more tempers

(hayi) thus the clumps transplanted were usually small. In the fields with high water level clumps were bigger, because in high water plants produce few tillers. Twenty first of June was the last date for transplantation. Rice transplanted after this date showed marked decrease in yield.

Transplantation was intensive phase and it required large manpower. Cultivators completed this phase by mutual efforts. Neighbours, relatives or clans cooperated and completed transplantation of rice fields of each family one by one. The family whose fields were brought under rice crop, prepared meals for the workers for lunch. In some areas dinner was provided. This practice was called kaad.<sup>55</sup>

### WEEDS AND WEEDING

The weeding of wattru was known as khushaba. It was a sort of puddling of mud resumed not only for the removal of weeds (katch) but it softened the soil around the plants, destroyed unnecessary rice plants at crowded places and helped in maintaining required space between plants for good harvest. Khushaba was done by hand as well as by foot. Human as well as animal labour was used in it. A group of persons standing in a row with sticks in hand kneaded the soil with their foot or applied hands to grab weeds, get out dense plants, disturb mud and level the uneven places for smooth water level. In case of big plots animals were ran on the crop. It was known as gopun nened. It may be mentioned here that broadcasting method required extensive weeding (nend).<sup>56</sup> and it was because of this fact that the peasantry believed that weeding increases rice output.

In case of transplantation method of rice cultivation, after fortnight time duration weeding started. A cultivator was never satisfied with a single weeding. The number of weeding varied from three to four. The weeds extracted were buried in mud or piled (madun) if large in quantity.<sup>57</sup> Weeding happened to be very hard stage in rice cultivation. Weeders entertained themselves by singing weeding songs.

### For a good rice harvest the following conditions were necessary:

1. Heavy snow in the winter on the mountains to fill the streams in the summer;
2. Good rains in March and the beginning of April;
3. Clear, bright, warm days and nights in May, June, July and August, with an occasional shower and;
4. Fine weather in September. Because the trouble which always haunted peasants was the fear of rain or snow at the harvest time. This was the event which caused famine and thus cultivators prayed for fair weather at harvest time.<sup>58</sup> Two acres of rice as the utmost that one man with a pair of bullocks can cultivate properly.<sup>59</sup>

### RICE RELATED DISEASES

All the more pain was taken for the protection of rice at the time of its harvest. It was a sumptuous food for the commonly found bird sparrow. In case the crop lodged or ripened earlier as some varieties did, it was a daunting job to avoid the sparrows till the crop was harvested. However cultivators had devised the required techniques to tackle this situation. Fencing (pai, rouit) was a popular way to guard the crops. Sometimes scarecrows (khok) were erected to ward off sparrows.<sup>60</sup> Sometimes qumcha was employed. It was a grass rope about seven feet long held tightly and moved quickly. All of a sudden it was hit to the ground and a cracking sound was produced which frightened the birds around.

### HARVESTING

Soon after the paddy fields turned golden in look due to the senescence process the cultivators

took cooked food and fried fish to the fields and eat that on filed boundaries. This was called baribatie. After this sickles were taken to ironsmith for sharpening their teeth. Once the sickles were ready and the cultivator were sure about the maturity of grains which he tested by pressing the awns with fingers and tasting them, harvesting started. Selection of the day was subject to clear weather and day's auspiciousness.<sup>61</sup>. Paddy harvesting had a number of stages. On the day one cutting continued all the day. Cutting generally started from right to left in rows called vouishh. In certain areas cutting from left to right also prevailed [this I have seen in Hajin Sumbal]. With sickle in right hand and the left hand busy in grabbing the rice the cultivators walked slowly in sitting posture, cut the rice in front of him and put that in rows behind. On the next day cutting was stopped at afternoon and if it seemed that rice cut a day before has satisfactorily dried it was tied into sheaves. After third day cutting (lonouin), sheaving (gundouin) and pilling (vatouin) continued simultaneously. It may be mentioned here that sheaving was generally done at late hours under moonlight. It was done so because dew turned the grass soft and it caused no scratches to hands or arms. It also checked the wastage of grains. After the rice was knotted into sheaves, then sheaves were arranged into chaak [four sheaves put together]. Then a person fixed the place for rick (gouin) and others brought the chaak and he framed ricks. Rick making demanded good knowhow and as such they were made by seasoned persons so that rains do not damage them.

In case of rains mowing was suspended and the paddy in sheaves was pilled. If the paddy had not dried fully and it looked that once it is pilled it may produce heat and damage the crop, then another safe method was followed. Paddy was pilled in panzwar. Panzwar also was a rick. It comprised three or four partitions. The space within the partitions received sun light directly and air had an easy passage. Rice dried well and did not suffer any damage.

The next stage was to shift the rice crop to the threshing ground (khal). It was resumed few days after harvesting. Peasants took some rest. Harvesting it may be added here was a hectic activity. Secondly peasants considered the warming of grain in ricks a must as it according to them matured the grains.

The land reserved for threshing crops was situated on different sides of villages, selected by cultivators as per their convenience. Threshing ground was always common land and every peasant had his allotted place. Crops were shifted to these ground on shoulders, or with the help of a carriage device (sheru) resembling a wooden stick with a hole at the top, or bullock carts were employed. The hectic job of collection was generally conducted on cooperation basis. Neighbours and blood related families furnished the job one by one. During the operation of shift a good amount of grains got wasted. Once a person shouldered a load of rice his main concern happen to be to reach the threshing ground as soon as possible. He could not rest in between. Thus he always walked quickly with the result the awns waved up and down, struck each other and shed some grains. It was perhaps the reason that at times cultivators sowed spiked rice varieties which hardly shed the grains. It was comparatively difficult to thresh these varieties.

Huge ricks were stocked and the ricks were prepared as carefully as the bridles were prepared. Ricks round (goin) or square (banni) were meticulously framed. Square ricks were usually framed by big asamis as it accommodated large quantity of rice. The availability of limited place in threshing grounds was also a factor. Simultaneously big asamis had also big manpower available. So they prepared the big threshing boards worked on by about eight people. Threshing was not simply beating sheaves against board. It had to be carried in a balanced manner, with a proper distribution of manpower in different engagements. Beating was always masculine job. Female supplied ration, swept the chaff on grains, knotted the sheaves together and carried head loads of rice to granaries. Granaries were at the most at

a distance of three or four minutes walk from threshing grounds.<sup>62</sup>

### Threshing (chambuin).

Threshing routinely commenced in the month of November. In certain cases it was done after winter. However that was done in exceptional cases. It was not a norm. Threshing point was called vaan. It consisted of three parts: back side for rice sheaves called vaan var; a plank or a log of wood in front of vaan var called mund; and the place in front of the mund where threshed rice assembled. It was called asami. The threshing point was so arranged that the people threshing rice did not face sun directly.

Work started at eight a.m. and continued till afternoon. In the mean time brief intervals were taken for the dressing of asamis and sweeping the chaff to one side. After beating operation, grass was piled up in ricks by an expert person. Grass was a valuable commodity for a cultivator because his cattle wealth was dependent on it. The grains contaminated with soil, dust and chaff were cleaned by sifting (vav puait). Tillers in the chaff were beaten to recover grains and grains were stored in granaries. With sunset the work was completed.

Threshing in a way was a recovery season for the tiller. But it was no less so for other related people also. All service classes (tiafadars) had to take the share of their service. The irons mith, locality shepherd, mosque attend (hamami), mosque imam, community priests (bayati peeir), boat ferries (karnais) shiqdars, millers, barber, merabs (water balaifs) were paid in kind.<sup>63</sup> Besides merchants selling pottery and other household items visited threshing grounds and sold their goods against rice.

### Storage of Rice

Storage was a serious matter so far as rice is concerned. All care was taken to store rice safely till next crop was available. Even peasants refused to sell the surplus rice till the harvest was successfully completed. We find multiple ways of storage to meet multiple situations.

### Subterranean granaries (ziis)

In certain parts of Kashmir especially Pulwama and Budgam which are known for karewas and safe from floods we come across an important storage technique devised for the storage of rice. It was known as ziius. It was an underground storage pit dug out by local potter in the courtyard or sometimes in the floor of the house. At the top entry was small just enough for the entry of a person. However below it had a space measuring about ten feet in diameter and six to nine feet in height. Basement was plane. After the pits were carved out its walls were mud coated and then a fire was burnt in it. It was baked in side so that its walls become strong and do not loose soil.

In certain cases people didn't fire the walls of the pits, only their sides were applied with mud coat. Before the rice was stored in autumn in these pits a fire was burnt in the pit so that in case of some moisture if any it was removed from the pits. At the same time the smoke so produced killed the insects and pests. Before rice was stored the floor of the pit was covered by grass. Besides floor the sides of the pit was also covered with grass so that soil does not mingle with the rice. As the level of the rice increased in the pit while depositing rice simultaneously layers of grass were added. This process continued till the pit was covered by grass, pressed hard and sealed by wattle and daub.<sup>64</sup> Each pit had a capacity of about eighteen karwars of rice. The number of pits was subject to the production of crop. Some families had more than one pit.<sup>65</sup> The grains were recovered with the help of lunguin. It was a small container made of osiers. It had a capacity of one or one and a half kg of rice. It was used for the recovery of rice stored in ziius. In order to stop the passage of grains from the gapes if any or that with the passage of time the osiers dried and felt loose, a soil cover was applied inside it.<sup>66</sup>

## STORAGE BUILDINGS

Besides subterranean pits, earthenware and pottery, cultivators used a special building for storage. In fact the buildings of the cultivators were of three types-residential building, cattle sheds and granaries. The granary was known as kutch, an erection like a huge sentry-box in which the grain was stored.<sup>67</sup> It was all made of wood standing on stilts. Wood was used because cultivators believed that it did not allow causing spontaneous heat within the stored items and at the same time grains also dried. It may be mentioned here that after harvesting there happened to be no scope for drying rice in the open for quick milling with mortar and pestle, for the temperature was low and the over caste often cloudy. Rice granary comprised of one or two sections (gaub). It used to have a ladder on outer side. In middle of the top there used to be a manhole which was used for the deposition of rice. In certain cases it had a hole at the bottom for taking rice out.<sup>68</sup> It was constructed on stilts because peasants could not afford to waste even a single grain. In premodern times there was no fool proof plaster system which could serve as a deterrent against rodents and keep the grains soil free. Only red ochre was used. It was wood that sufficed this purpose. The bottom floor of the granary remained about three feet above ground and thus there was least chance of moisture or rodent damage. Stilts also made room for the accommodation of stray canines at night and they simultaneously guarded the stores.

Earthen silos (lopun) were an other important technique commonly used for the storage of rice. These silos were fire proof and were put at the top story of the house. Rice used as seed was stored in them. They were of different sizes and accommodated about two to three kharwars of rice. Sakes made of paddy grass (yatran) were another device used for the storage of rice.

## DRYING AND HUSKING

For the husking of paddy, a mortar and pestle were in general use. They were readily found in residential compounds. There are references of jindra or husking machines also available. The jindra was a large wooden axle to which two large curved wooden arms were affixed in the middle at an interval of some distance and nearly opposite each other. This was being constantly worked by falling water directed through an open pipe over a wooden wheel also affixed to one end of the axle, something akin to a water wheel. The tow arms in turn struck the near end of the machine which worked to husk the paddy at the farther end. There were only six such machines in Kashmir in the early 19th century.<sup>69</sup> During 15th century Haider Dughlat introduced narah lul for drying rice. Here is the method introduced for drying shali: a large earthen cauldron filled to the lid with shali is placed on fire. When it becomes a little warm, the shali (inside) is rolled (with a rod); like this the heat of the fire dries it. This method was in use in Kashghar from remote times. But for the first time it was introduced in Kashmir by Mirza Haider Dughlat.<sup>70</sup>

## ENJOYING NEW FOOD OF RICE CROP

Safe harvest was a matter of festivity in rural area, for which peasants always prayed. It meant a hunger free future at least for a year. Therefore, this joyful occasion (novkarun) was enjoyed with humility and auspiciously. Food was prepared from newly harvested rice. Near & dear were invited to participate and priests were specially invited to pray for the peace & salvation of the deceased forefathers. This was known as khateim cremony. This ritual was not common among people with agricultural background in rural society only, even nonagricultural classes, carrying trade, commerce and craft in urban areas and townships bought new rice every year through some aquint, rice dealer or a friend to celebrate meals made of it and arrange feasts for family priests so that they recite special prayers for the grace of dead ancestors.<sup>71</sup>

## CONCLUSION

Rice cultivation has been so prevailing & predominant in the life & conditions of the people of Kashmir that cultivators have 'considered no crop worthy of attention save rice'<sup>72</sup> Whenever two rural persons meet, they first ask & inquire about the wellbeing of their rice crop, the seeds used, the manures applied, weeding, ploughing so on & so forth. Conversation generally concludes with the commitment to give or get the seeds. So rice culture & agriculture are synonymous in Kashmir. This crop has dominated landscape in Kashmir, right from the historic moment when it was adopted & propagated far and wide, wherever cultivators found scope for its growth. It served as the main supply of food & therefore it has genuinely been described as 'the only hope of peoples existancee.'<sup>73</sup> To sum up this article it is worth to excavate the social unconscious & find out social reservations viz a viz food so that the efforts put in to procure sustenance through this crop is understood in full. In this regard folk lore or local sayings in Kashmir are quite revealing. These sayings as a whole give prime importance to food. There is a popular saying in Kashmir that 'anna [food] came first, faith came latter'.<sup>74</sup> It is said that food first then clothing (godia yaied pati theid).<sup>75</sup> Progress comes through food (biata sait chi vatie).<sup>76</sup> No concern is serious than food procurement (baita dood goo buud dooad).<sup>77</sup> Grief of food calamity is far agonizing than the grief of the dead person (murds chii vadan behuit ti batus chii vadan vodni ).<sup>78</sup> 'Draught, destruction of crops by ants, locusts and birds' figure prominent among 'the six calamities' that visited Kashmir.<sup>79</sup> People consider black gram as a sign of scarcity and hungry mans look inauspicious.<sup>80</sup> Rice is showered on bridegroom.<sup>81</sup> Bullocks used in rice cultivation are so valuable that peasants swore by them and their death was a big tragedy.<sup>82</sup> Safe & sufficient food is a permanent feature of the daily prayers of the masses in Kashmir.

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1. Cultivators were always keen to procure best seeds. Thus whenever they had a chance to visit some new place they enquired about crops and tried to get the seeds. In certain cases, as told to this research student by the respondents, they procured seeds from a far off pilgrimage centre like Maadana in Sudia Arabia.
2. This fact is corroborated by no less an authority than Walter R. Lawrence who keenly observed Kashmiri society for seven years in the late nineteenth century. He writes that much can be done to save life by introducing the cultivation of potato, turnip and carrot. 17
3. Walter R. Lawrence, *The Valley of Kashmir*, p. 24.
4. T.T Chang, *The Origin, Evolution and Breeding of Cultivated Plants* p. 29; 'where and when and by whom rice was domesticated, in this vast area from India to China, remains to be determined', J R Harlan, article 'The Origin of the Cereal Agriculture in the Old World', *Origin of Agriculture*, ed. By Charles A. Reed, p. 371.
5. Randhawa, *History of Agriculture in India*, Vol. I. p. 271.
6. Joseph Needham, op. cit., p. 481.
7. Sir Mortimer Wheeler, *Civilization of the Indus Valley and Beyond*, p. 90.
8. *Indian Archeology* [a review], 1981-82. pp. 21-23,
9. *Ibid.*, pp, 21-23.
10. F.A Lone Maqsooda Khan and G.M Bhat, *Palaeoethnobotony*, p. 112.
11. Aijaz Bandy, *Prehistoric Kashmir*, p. 47.
12. *Ibid.*
13. *Ibid.*, p.202.
14. Joseph Needham, *Science and Civilization in China*, vol.iv, part ii, p.132. In Kashmir also broomcorn

is called ping.

15. The first evidence of rice from Semthan neolithic site is 1500 BC and the canals constructed during sixties and seventies of the twentieth century and importing left irrigation pumps for watering & dewatering so that rice crop covers those patches of land which were hitherto not used for rice crop because of the lack of resources, technology and political will , covers a time span of three thousand and five hundred years).

16. Plough has been mentioned in Nilmatapurana in connection with the great reclamation of Kashmir when Balarama or haldar the god of plough, made this lake devoid of water by breaking forth Himalaya with the plough, p.45 , Volker 1)

17. The dog burials, pit dwellings and bone tools recovered from Burzohom also suggest the influence of Neolithic of northern China. For cultivation practices, see Needham, pages 504-505.

18. Kalhanas Rajatarangini, Vol. I, p. 17.

19. Till recent times this crop received no manure. Lawrence, op. cit., p. 341.

20. M.C. Graw-Hill, Encyclopedia of Science and Technology. Vol.I, p. 195.

21. Nilamata Purana, Vol. II, p. 61

22. Lawrence: P 329)

23. Joseph Needham, op. cit., p. 486.

24. Lawrence, op. cit, p. 240.

25. Ibid., p. 333.

26. Ibid., p. 332.

27. Pandit Hargopal Khasta, Guldast Kashmir, p. 30.

28. Following is the list of rice varieties cultivated in Kashmir : Anzan, Auzal-crad, Anar-dani, Basmati, Braz, Baber, Ban-i-kala, Bud-i-Anzan, Budji, Bud-zug, Bud-zagur, Bari, Pout-bra, but-boul, pout-kumad, joub, taich-itaichal ,tumli hal, chogul, chitter-hal, chahnani-nour, chata zug, chander hal, chit gur, chuk-i-anuri, chondur, china, dood-i-krad, dood-i-braz, dood-i-kroor, dood-i-hal, raeen, rashum, ram-i-hal, ropa--hal, rah babn, zuk-i-tutur, zuk mavar, zagr, zuk, chunder-i-hal, sukhdas, sokal, sheermal, shah gur,shal-i-kuin, shoon, shala-i-anzan, shala-i-zug, kuo, kuin, khran-i-shoon, khaice nuir, kata chan, krahn-i-hal, krahn-i- braz, kanhama, kaval-i-krad, kal-i-neur, khрани krad, kanihal, kalor, kho zuir,kabro, kumund, kral-i-anzan, kochi anzan, knur, kava anzan, kachur neur, kavagur, munk-i-hal,krahni neur, krahini zuk, guri tanj, gurah, gurah kunir, gurah mushk, gud krhun, gud vozul, lashoor,lacha hal, lar boul, loueel anzan, lahn-i-zug, mukht-i-hal, mushk budij, mukhta-i-braz, maver, matrihal, mah dun, mah anzan, munka shal, Mughal boul, marvad, mukth-i-anzan, moin daini, niwer,nehali, nik-i- anzan, nik-i-zak, vatal hal, har-i-kant, yemberzal, he boul, gulzag. Sources- Gulzar-i-Kashmir, Kashir Dictionary, Local informant.

29. A. Rahman [ed.], History of Indian Science Technology and Culture, AD 1000-1800, p. 321.

30. Lawrence, pp. 332-333.

31. Local informant.

32. Ibid.

33. Lawrence, op. cit., p. 331.

34. Ibid., p. 335.

35. Ibid., p. 330.

36. Field study.

37. Lawrence, p.327.

38. Far reaching changes occurred in Kashmir in the beginning of the second half of the twenty century. Peasants obtained property rights, the nature of state changed from dynastic to democratic,

aristocratic to welfare; Kashmir was well connected with other parts of the country, population also increased. All these factors created a new social milieu wherein peasants shifted to a different technique of production without having anything at risk.

39. In the villages around Sopor those families who had manure piled in courtyard were known as bunvaeel meaning rich in manures.

40. Local informant.

41. Ibid.

42. Ibid.

43. Ibid.

44. 58. Pine pitch (kilm). In low lying area a bacteria developed in the stagnant water in summers. However at dawn and dusk it turned inactive. As temperature increased it became deadly and stung bitterly both men and oxen on the organs exposed to water. It caused pimples with severe itching pain which lasted for hours together. In case of severe attack the infected organs developed swelling. In certain areas the fields were known for its prevalence. These fields were called mohnev khov meaning human killer.

In order to neutralize the attack pine pitch was used. It was recovered from pine. Before stepping into water for rice plantation, it's weeding or for collecting grass for cattle it was rubbed on legs and arms. Every day a fresh coat of pine pitch was applied to the exposed parts. Kilm was prepared locally. Pieces of pine wood were stored in a pottery ware. The pot was put in the fire upside down. Below the mouth of the pot another pot (choud) was fixed. As the heat increased the wood in the pot waxed out pitch and deposited it into the pot below. After the pieces were fully exhausted the operation ended. However given the heaviness of the pitch which didn't rub easily, eatable oil was added to it. It was rubbed off by kerosene oil. During rice dibbling or weeding a particular insect called woner sting on breast causing a pimple and temporary but painful itch.

45. Local informant.

46. Ghose, Ghatge and Subrahamanyam, op. cit., p. 46.

47. Needham, op. cit., p. 496.

48. Lawrence, op. cit, p. 451.

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50. Local informant.

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53. Ping Ti Ho, ' The Indigenous Origins of the Chinese Agriculture ', in the Origin of Agriculture, ed. by Charles A Reed, p. 448.

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57. Local nformant.

58. Lawrence P. 335.

59. Ibid., P.331

60. Local informant.

61. Friday was generally avoided. It was believed that it had gobuier i.e. there were chances of injury.

62. Local informant.

63. Local informant.

64. Information collected during field study in Pulwama, Budgam, Guraz Kashmir.

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73. Kalhanas Rajatarangini, op.cit., p.
74. Kashmiri quite often say in daily conversations regarding food that gud av ann , patie av daram.
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