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TOWARDS MORE FOOD  
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## INTRODUCTION

*"May the ploughshare break up our land happily; may the ploughman go happily with the oxen; may the earth be watered with sweet showers happily; may prosperity be granted to us."*

*RIG-VEDA*

Agriculture has been of fundamental importance for India for centuries. An ancient scripture says: "Grow more food. It should be a real vow. The earth is *anna* (food) . . . . He who knows this secret knows the real truth . . . . He is blessed with a happy family and with cattle; he shines, becomes famous and great." Even today, more than three-fourths of India's population is made up of village people. The country's prosperity depends on what the peasant can take out of the land.

Yet, the villagers have for long been neglected. When we became free of foreign rule, our vast rural community was one of the most impoverished in the world. The challenge that faced us on achieving independence was to raise the level of rural life. The peasant was too much at the mercy of seasonal rains. He had to be rescued from this dependence on the vagaries of nature by creating secure sources of irrigation. He was using primitive tools and employing outdated methods of agriculture; he had to be given better tools and taught improved and scientific methods of cultivation. Better seeds and fertilizers had to be made available to him.

All this was undertaken by the Government after we became free in 1947. When the First Five-Year Plan of development (1951-56) was drawn up, the highest priority was given to the improvement of agriculture. The Plan included many big projects for storing river water for irrigation. It also provided for the construction of thousands of tanks and wells throughout the country. The use of improved seeds, modern implements and fertilizers was systematically promoted. Under the Community Development programme, the Government took up the ambitious task of providing all the 550,000 villages in the country with the services of Gram Sevaks, agricultural specialists, veterinary doctors and other skilled personnel. But

the success of the Plan depended not only on these efforts of the Government, but even more on the willing and enthusiastic co-operation of the people. The Government provided irrigation facilities, improved seeds, fertilizers, and so on. But it was for the agriculturists themselves to utilize these on a wide scale and to the best advantage. Our village people proved that they had the desire and the will to achieve a better life by producing more. They took to improved methods of cultivation. The result of the combined effort of Government and the people was that, during the First Plan, the production of food and other crops rose by several million tons.

But the progress made under the First Plan was only a beginning. Though there was increase in food production, it was not adequate for meeting the needs of our growing population. We still had to import food from other countries. We had to pay for this in foreign exchange which could otherwise have been used for importing steel and machinery for building up our industries. Under the Second Plan, as you know, we are trying to achieve rapid progress in industrialisation. This industrial development will ultimately help agriculture itself, because we will then be able to produce all the steel we need for our agricultural implements, all the fertilizers we need for our fields, and all the machinery we need for constructing irrigation dams and sinking tubewells. We will also be able to set up our own textile mills without importing the machinery, build our own ships, and so on. With industrial development, our country will become as prosperous as the advanced countries of the world like the U.S., Britain, Russia and Japan.

If we are to succeed in this aim, we should not only stop importing food; we must produce a surplus, over and above our requirements, to export to other countries.

Only thus can we earn enough foreign exchange to pay for all the large quantities of machinery and equipment we need to import from abroad for our industrial development. Agricultural products like tea and jute have always been among the most important items of our exports which earn foreign exchange. Therefore, agriculture has a very important role to play in the economic development of the country.

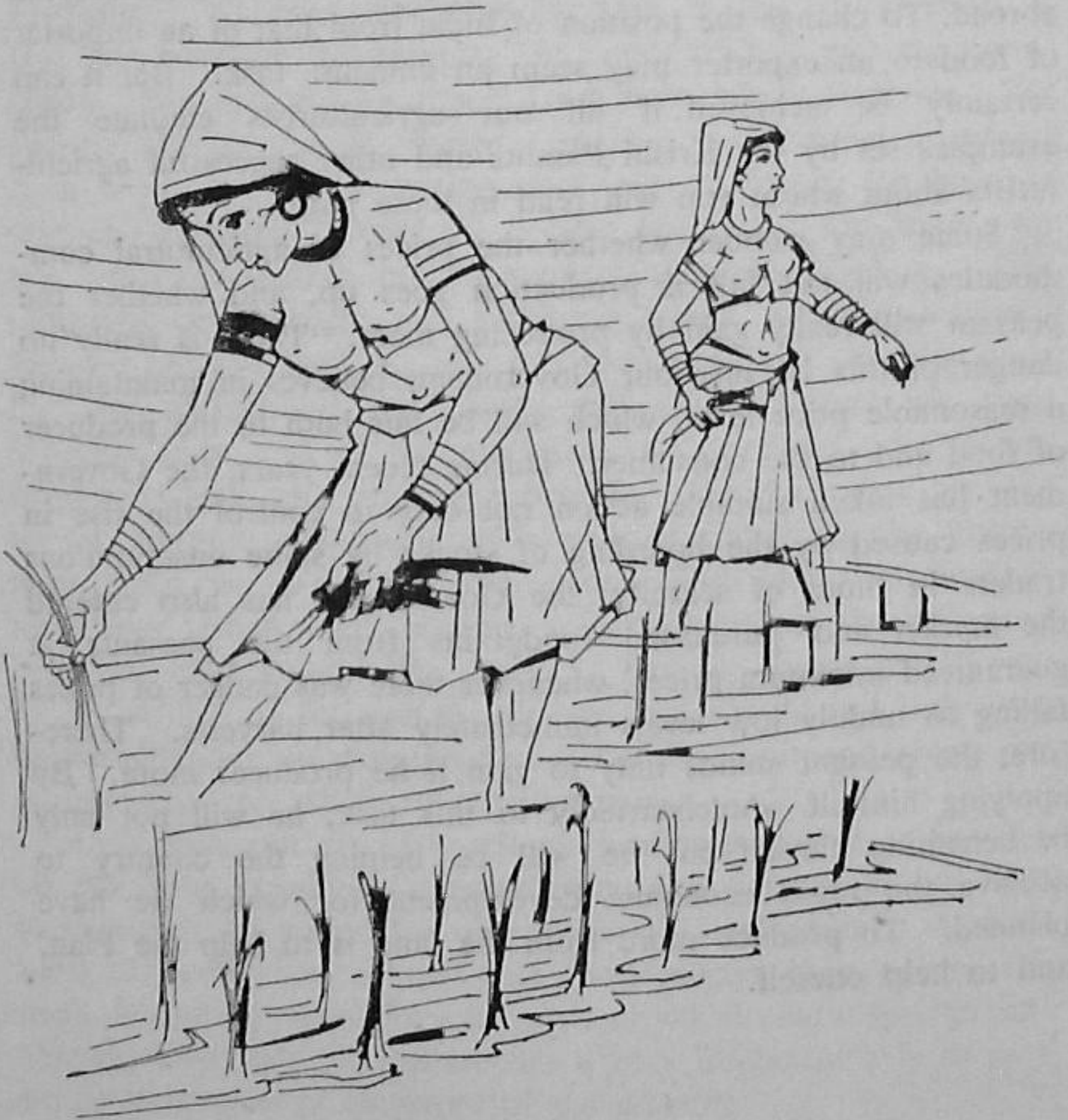
As we saw earlier, our people have shown that they have

the desire and will to work for a better life. In the pages that follow, you will read about some outstanding individual farmers who have increased their own incomes, and at the same time helped the country, by producing more. But the average level of production per acre in India still remains very low; in fact, in this matter, India is among the most backward countries of the world. When millions of farmers are engaged in agriculture, as in our country, it is not enough if a few hundreds or even thousands of them attain very successful results. It is only when these exceptional examples of success become the rule that we will be able to produce enough from land to meet the needs of our people and also to export a substantial surplus abroad. To change the position of India from that of an importer of food to an exporter may seem an immense task. But it can certainly be achieved if all our agriculturists emulate the examples set by the Krishi Pandits and other successful agriculturists about whom you will read in these pages.

Some may wonder whether the prices of agricultural commodities will not fall if production goes up, and whether the peasant will really gain by producing more. There is really no danger of this because our Government believes in maintaining a reasonable price level, which will be fair both to the producer of food and to the consumer. During recent years, the Government has taken suitable action not only to control the rise in prices caused by the hoarding of stocks by some unscrupulous traders in times of scarcity; the Government has also entered the market and purchased foodgrains from the peasants at guaranteed minimum prices, whenever there was danger of prices falling to unduly low levels immediately after harvests. Therefore, the peasant stands only to gain if he produces more. By applying himself wholeheartedly to this task, he will not only be benefiting himself but he will be helping the country to achieve the rapid economic development for which we have planned. To produce more from the land is to help the Plan, and to help oneself.

PADDY YIELD DOUBLED

An example of pioneering effort on the land comes from the Phuliatola farm in Bihar, a few miles from Patna. Boharam Rai had the old tradition of farming behind him, while his son Ram Lakhan, an educated youth, had the fervour to do something better. Luckily, the elder Rai kept an open mind. When Ram Lakhan suggested that modern methods might be tried, the father readily agreed.



The Japanese method of paddy cultivation pays rich dividends.



They first turned their attention to rice, which is the important crop in the area. They obtained details of the Japanese method of paddy cultivation\* and followed them step by step.

The result was striking. They succeeded in growing two grains of rice where one stood before. The Rais harvested 60 maunds of rice in place of the usual 30.

It had, no doubt, cost them more to cultivate by the new method—in transplanting, labour and other operations. But the higher yield more than compensated the extra costs.

The Rais were not complacent. In addition to following the Japanese method, they tried new varieties of paddy that were recommended by the State Agricultural Department: BK 36, the medium variety, 6AEI, the early variety, BK 498-2A for water-logged soils, and BK 115, the early variety for highlands. This was to find out what variety was best suited for each part of the farm.

They knew that the selection of quality seed was not everything. Scientific manuring was important. They, therefore, grew *sanai* and *dhaincha*, and used them as green manure for paddy as well as sugarcane.

In the case of sugarcane, they substituted Co. 453 and Co. 419 for the local varieties. They planted the cane in furrows two feet and nine inches apart instead of by the usual method of planting shallow. The result was that 600 maunds of sugarcane were harvested where only 400 were obtained before.

The Rais did not stop with paddy and sugarcane. They tried new methods in other crops, like wheat. Using improved seed, and by dibbling it instead of broadcast sowing, they harvested 20 maunds of wheat from the same field which had been yielding a maximum of only 12 maunds.

### FROM SUCCESS TO SUCCESS

In 1954-55, a man from the interior of Madhya Pradesh shot into wide fame. This was Narayanlal Gopalrao Ujaoney

\*For details of the Japanese method of paddy cultivation, see Appendix at page 53.

of village Pardi, a few miles from the Arjuni railway station in Bhandara district.

Ujaoney produced the highest paddy yield of 102 md. 7 sr. 9 cht. per acre in that year's competitions and received the title of 'Krishi Pandit' and a cash prize of Rs. 5,000 from the Government for his 'outstanding contribution to the cause of agriculture'.

Few had thought that Ujaoney, a manganese mine-owner and a *bidi* leaf dealer, could also be a successful farmer.

But behind his success lay enterprise and hard work.

In 1952 Ujaoney surprised his neighbours when he won the first prize at the *tehsil* level rice crop competition on his 16-acre farm. From that time onwards, the small Ujaoney farm was the centre of attention for the whole Pardi village.

But success did not make him idle. On the contrary, it spurred him on to greater action. He won the prize again the next year, and the following year. In 1954-55 he scored the all-India record, which brought him the 'Krishi Pandit' award.

Ujaoney had followed all the steps recommended in the Japanese method. To this he added his ingenuity. While preparing the field for transplantation, he followed his own method, as it suited the local conditions.

He gave six ploughings in all to the field. During the dry months of May and June, he penned 2,560 sheep and 1,500 cattle to the acre. He then added 30 cartloads of compost manure per acre. In the first week of July, he applied 200 lb. of bonemeal and 400 lb. of superphosphate. Just before transplanting, towards the middle of the same month, he broadcast 100 lb. of ammonium sulphate per acre. Transplanting was completed by the third week of July.

In transplanting, Ujaoney took good care to maintain a distance of 9"  $\times$  9" from plant to plant and row to row. In early August and mid-September he did two top-dressings and each time applied 100 lb. of ammonium sulphate to the acre. Shortly after, he applied another 200 lb. of manure mixture (ammonium sulphate and superphosphate). Lastly, he added 100 lb. of muriate potash.

He did three interculturations with a *touchigurma* (inter-cultivator) and sprayed the crop with 5 per cent BHC and 'perenox' as a precaution against jassids and blast attacks. This protection given at the appropriate time was, according to the farmer himself, responsible for at least 10 per cent of the yield.

The heavy manuring created the problem of 'lodging' or bending of the crop. He solved it by cutting the plants twice and later using poles and ropes.

How did Ujaoney repeat the success year after year? To him it was simple. 'Well-prepared plots, high bunds and the Japanese method of cultivation', says he. 'I divided the block into smaller plots, levelled them properly and put up bunds all round.' Seepage water from an irrigation tank above the plots helped the fields by keeping them wet throughout. And the bunds conserved to a great extent the moisture in the field.

Again, the farmer's ingenuity is seen in the way he utilised the bunds. On the smaller ones he grew *popat* (beans) and on the bigger ones of the irrigation tank he grew cashewnuts.

No wonder, Ujaoney increased the general productivity on his farm. From the normal 25-30 maunds per acre, he raised it to 50 maunds. His example thrilled the neighbouring farmers so much that a large number of them are following his method. The results are very good.

On the farm now stand a well-built house with provision for a store, an office as well as living rooms, a kitchen garden and a flower garden with trimmed hedges—indeed a model for our villages. Narayanlal Gopalrao Ujaoney is leading a happy, prosperous life. He is happy because he has been successful himself and has created a new enthusiasm among his brethren for a better life.

### A GEM AMONG FARMERS

In our vast country, soils vary from place to place. And so do climatic, irrigational and other conditions. In a few areas, perennial irrigational facilities exist or have been developed by

human efforts. In large areas we still depend on the vagaries of the rain.

It was in one such uncertain area, in the Ramnad district of Madras State, that a young farmer, Sankaranayana Thevar, showed that he could produce nearly seven times the normal yield.

Paraikulam, a hamlet of 40 houses and 200 inhabitants where Thevar lived, had remained true to its name. Paraikulam, in Tamil means a rocky tank. Indeed, the tanks in the village contained all rock and no water. The effect of aridity was visible as far as the eye could reach—no trees, no vegetation, no cattle or poultry.

But even in such conditions, Thevar did not lose courage but struggled hard. Typical scion of a community known for its dogged perseverance, the peasant utilised the years of his struggle as years of experimenting and learning. And, when the time came, in a single year he did what cruel nature had prevented him from doing for many long years. On the soil of Paraikulam he produced as much as 11,255 lb. of paddy per acre as against the normal 1,700 lb. Then, year after year, he won prizes for the highest crop yields. The first prize came in 1951-52 in the *firka* and *taluk* competitions. The next year he won in the district, regional and State competitions. The State Government then gave him the coveted title of 'Uzhawa Manikkam'—gem among farmers.

Recounting his experience on the plot that brought him a high yield, prizes and fame, Thevar has said how he started work immediately after the previous harvest. He brought a pen of a thousand sheep to fertilize his 0.82-acre plot. Four months later he gave the field a few ploughings, taking advantage of the seasonal rains. A week later he put into the field 1,000 lb. of green (*avarai*) leaves and after another week gave it two more ploughings. When the field thus became completely miry, he applied ten cartloads of compost manure (224 lb. of superphosphate mixed in the pit), and then gave a final ploughing followed by putting in 800 lb. of groundnut cake.



When manures mix, they give the soil all the nourishment it requires.

The time for planting the seedlings arrived. He levelled the land with the levelling board and planted the seedlings brought from a dry nursery. He exercised great care in this important operation, putting in three or four seedlings in a hole with a spacing of seven to eight inches.

Twenty-five days after transplantation, Thevar did the first weeding. A fortnight later, he found too much vegetative growth and did the topping of the leafy portion.

The land was again manured with 336 lb. of groundnut cake and 40 lb. of ammonium sulphate. The crop took on good growth and, on the 75th day, a second topping of the vegetative growth was done. At the same time he gave the second weeding and then applied 224 lb. of *neem* cake. Topping was done

for the third and last time two weeks before flowering to prevent lodging. The next day, Thevar applied another dose of 40 lb. of ammonium sulphate.

Thevar had spotted green jassids on the nearby fields which put him on the alert. As a measure of protection against the pests, he dusted on the crop 30 lb. of gammexane D-120.

Thus did Thevar get a record crop from a local variety of seed 'vellai sirumaniam', noted for its heavy yield. The duration of the crop was 6½ months.

Thevar's efforts, which brought him prosperity and fame, created in the whole neighbourhood a spirit of emulation. The peasants started vying with one another in trying to raise higher yields. What is more, old jealousies and rivalries changed into healthy competition, and Thevar helped to foster the new spirit. He gave advice to any who sought it. Indeed, Thevar's initiative has produced a new life in the area around Paraikulam.

### 'RONAQ' IS GLORY

How an intelligent adoption of improved agricultural practices can result in two to three times more of yield from a farmstead is the story of Ronaq Ali. A young farmer of Imalia village in the Bulandshahr district of Uttar Pradesh, Ronaq Ali has brought *ronaq* (glory) to the whole neighbourhood.

In 1954-55 he produced well over 35 maunds of wheat per acre, which is double of what was ever produced in the village, and obtained the second State prize in a high-yield competition. And he has gladly shared his methods with anyone who liked to know.

In the month of June, he sowed a maund of *sanai* per acre of the field which he was going to put under wheat. At the time of sowing the *sanai*, he applied 1½ maunds of superphosphate. In the first week of August he ploughed in the *sanai*. He added to it five maunds of bonemeal per acre.

Ronaq ploughed the field ten times more. The sowing time was now drawing near. Seven days earlier to sowing, he put in the field another dose of 1½ maunds of a general fertilizer

mixture (superphosphate, urea, bonemeal and ammonium sulphate in equal quantities) and two maunds of castor cake.

In selecting the seed, he considered a number of good quality varieties and finally decided on *Pb 591* variety. He sowed this early in the last week of October. In the course of the second month after sowing, that is, in December, Ronaq top-dressed the crop with ammonium sulphate at 30 seers per acre. Three irrigations and two interculturings were given to the crop before a happy Ronaq reaped the prize-winning harvest.

Ronaq's progressive farming had started in 1950 in a simple way. An agriculture inspector once casually told him that 'he who levels his land becomes a rich man'. Ronaq levelled his land and thereafter worked on it for his success. All through he found a friend and adviser in the agriculture inspector. He carried out his experiments first on a one-acre plot, and gradually extended them to almost all his holding.

The heavy crop brings money to Ronaq. He sells his grain to the Government seed stores and gets a 12½ per cent premium over the market rate. The Government seed stores purchase only good and improved varieties of grains for seed for distribution to farmers. Ronaq produces such seed and earns the premium.

Ronaq is a believer in self-help. According to him, the Government can and does help in supplying fertilizer and improved seed, and giving advice, etc. But he knows that it is, after all, the farmer who has to make the best possible use of these facilities. In his case, he put the advice tendered by the agriculture inspector to practical use. 'But for that', Ronaq says, 'I would have continued to be a poor struggling farmer trying to make both ends meet'.

When people praise him for his good work, Ronaq says with the shrewdness typical of the rural folk, 'I may be helping the Plan but I am helping myself too.'

#### A 'KRISHI PANDIT'

Rishab Kumar, who hails from Khurai village in the Sagar district of Madhya Pradesh, was declared 'Krishi Pandit' in

wheat for 1954-55. He earned the high honour by producing the maximum yield per acre.

Rishab Kumar's field has black cotton soil (*Mund I*) and is well levelled and irrigated. The previous crop in the field was also of irrigated wheat which received green manure (*sann*), compost and fertilizers.

To prepare the land, Rishab Kumar did one ploughing and six diskings.

For sowing, Rishab Kumar chose the *H. 65* variety of wheat, obtained from the Powarkheda Government Seed Farm. Sowing was done by seed drill in the middle of October 1954, at the rate of 80 lb. per acre. The distance between rows was kept about seven inches. Three irrigations were given before and during the growth of the crop.

The field was green-manured with sannhemp. Before the rains, it received 30 cartloads of compost per acre. Ammonium phosphate and fertilizer mixture at 250 maunds per acre were added with the seed, and the field irrigated after about a fortnight. After a month, Rishab Kumar applied 100 lb. of ammonium sulphate per acre and gave an irrigation a month after.

He harvested the crop towards the end of March 1955. It weighed 72 maunds, 2 seers 9 chattaks of good wheat per acre. This won him the award, together with a cash prize of Rs. 5,000.

### A BUMPER BAJRA HARVEST

In Saurashtra there is a village called Mota Gundala in the Jetpur *taluka*. Here on a 20-acre farm lives the happy Kotadia family. For over two centuries and a half, the Kotadias, like others in the area, had been growing various crops in rotation, like wheat, bajra, jowar and recently paddy. But, throughout, farming was carried on in the same primitive way, which brought very little return from the land. It was only a chance glance at a Gujarati daily paper that changed the face of Mota Gundala.

Once the daily carried the story of how a Soviet farmer had obtained a remarkably heavy yield of *bajra*. The story was



related to Bhada Bhima Kotadia, the grand old man of the village. This fired the peasant's imagination. If somebody in Russia obtained such a yield with a little extra care, why not he and his village?

Bhadabhai, as he is popularly known, cultivated the next bajra crop by the new method. And lo to behold! the response from mother earth was much more than he expected. Bhadabhai got a good 76 maunds of bajra to an acre. And 76 maunds is more than five times the average that the soil had yielded till then. The method worked. And his neighbours admiringly told Bhadabhai that he no longer owned only twenty acres but a hundred. For, was not the crop equal to the yield from a hundred acres?

Bhadabhai blazed the trail. Others in the village and the taluka followed his example and produced bumper yields, almost unheard of previously.

What is this miraculous method? The Saurashtra Agricultural Department describes it in the following way.

In the first week of June, one irrigation is given to the field meant for bajra cultivation. After seven days, the soil is enriched by 20 cartloads of farmyard or compost manure and 200 lb. of superphosphate to each acre. This is followed by a second ploughing, and harrowing and levelling. Then follow three more ploughings, and harrowing and levelling.

This operation brings the land to a very fine tilth. The field is then marked in both directions by drawing a *dantal* with prongs 18 inches apart. The seed is sown (dibbled) at the places where the lines cross, putting five or six grains in each place. In four or five days the sprouts appear above the ground.

Interculturing is done as in wheat. In the third week, top-dressing is done around each hill, with a manure mixture of eight parts of groundnut cake and one part each of ammonium sulphate and superphosphate. This manuring is at the rate of 200 lb. per acre.

As the crop is three to four weeks old, a wooden plank is drawn on the standing crop. When the crop resumes its natural position, as a result of the stimulus, the plants produce profuse tillering. Hoeing is continued and done as often as possible.

A second dose of manure mixture is given as top dressing just before flowering. It is mixed with the soil by *khurpi*. In case there are no rains, and the soil is not sufficiently moist, one irrigation is given after the second top-dressing. An important point to remember in irrigating the crop is that water should be given only when there is a marked effect of want of moisture.

The final stage of harvesting is a continuous process. Instead of the usual practice of harvesting ear-heads all at the same time, only those ear-heads should be harvested which have ripened. Those that are on the main stalks ripen earlier than those on the tillers.

Seeds for the next crop should be the grains that come from the compact and big sized ear-heads.

Thus we see that a careful combination of manuring and watering, coupled with some extra effort, leads to a very rich crop. What is more, the grains from such crops find a ready market, fetching a higher price. Indeed, the gain is manifold. When a farmer like Bhadabhai produces a bumper crop, he helps himself and sets an example for others.

### A MIGHTY MAIZE CROP

When the usual average yield per acre of land is 20 maunds of maize, he is a great farmer who produces a hundred maunds—five times the normal. Jagir Singh of village Kanthala near Chandigarh in the Punjab is one such.

Jagir Singh is the owner of a small farm of eight acres, in a part of which he had been growing maize. For some time he had heard about the 'much-talked of' hybrid seed and, in 1956, he decided to give it a trial. He went to the nearby Government Hybrid Seed Farm, and bought maize seed to try on a single acre. Jagir Singh was careful enough to enquire from the Manager of the Farm about the special care the hybrid needed to produce the high yields for which it was reputed. He found it to be nothing beyond his capacity.

When Jagir Singh harvested, it was a good 78 maunds and 13 seers. He was happy beyond measure; but he is by nature

ambitious. If the first crop was four times the average, he must try for still better results. Further, he had heard that a farmer in Ambala had succeeded in producing 90 maunds with the same seed. He did not like to be beaten. Therefore, he went to the Government Seed Farm and bought the hybrid seed for the next crop, this time for a larger area,  $2\frac{1}{2}$  acres. For the first year the seed was of the variety Hybrid U.S. 578. Now the Manager gave him a different seed called Hybrid Kansas 1859. The Government wanted to see how the different American hybrids fared on Indian soil.

While Jagir Singh sowed the hybrid seed, his neighbours stuck to their usual *desi*.

Jagir's crop took on good growth. From the very beginning it looked so good that the villagers of Kanthala often said: 'Jagir Singh's  $2\frac{1}{2}$  acres will yield more cobs than the whole maize area in the rest of the village put together.'

So was it said and so did it almost happen. The experimenting farmer harvested a full 100 maunds, 12 seers and 7 chattaks to each acre under maize!

This incredible increase in yield was mainly due to the new seed he used. But what was the special care he gave to its cultivation?

When Jagir first decided to change over to the hybrid seed, he gave the land three good ploughings in the third week of June. He then applied 20 cartloads of cattle manure and two bags of ammonium sulphate to the acre that was to grow the maize. In the last week of the month, he planted the seed at six seers to the acre. He used the 'corn planter' for sowing and, to get straight lines, used ropes. He gave a spacing of  $2\frac{1}{2}$  feet between lines and two feet between hills and saw to it that each hill received three seeds.

Depending on the rainfall received, he gave two hoeings with the *khurpa* and one more with the hand hoe. With the second hoeing, he applied the second dose of fertilizer—two bags of ammonium sulphate—as a side-dressing. Jagir has a Persian wheel on his farm. From this he rolled out two good irrigations to the crop in August-September. With this much of care, he got the reward of over 78 maunds of cobs from that acre.

One morning, in February, as he dug up a potato plant from the crop approaching harvest to see how it had responded to his labour and caution for close on seven months, his face brightened. The plant came up with big-sized and heavy tubers. In the last week of the same month, he harvested the prize-winning crop.

The above is only a part of Byatarangappa's story. The first time he grew potatoes he found the crop gave him the ratio of one of seed to 33 of produce. In the second attempt, he improved the results to one of seed to 35 of produce. The experiments encouraged him to enter the competition.

The farmer has an interesting background. He belongs to a family of hard-working garden-farmers. After completing a brilliant academic career and obtaining a diploma of L. Ag. and a gold medal for 'general proficiency in agriculture', Byatarangappa entered Government service. Here, as in his school and college, he produced brilliant results. But, while he was working at the Government-owned Irwin Canal Farm, he felt a strong yearning to farm on his own. He had neither money nor land to start with. Luckily, an agricultural colony near Mandya was then under planning and he was one of nine who settled in the colony. The Government gave him 15 acres of irrigable land and 10 acres of dry land to work his way up. They also helped him with some money. Yet it was an uphill task, and he had to depend largely on his own efforts.

For six years he worked on this farm, cultivating tobacco, cotton and paddy, and did well. Then drought came and left the land parched.

He returned to his village, where he purchased five acres of land which was of no use to anybody, and put his heart and soul into the work. He dug a well and converted the land into a garden land. Another two years of hard work and he was the best farmer in the village. From then on he marched from success to success. He began with growing vegetables, paddy, and *ragi*, which are the crops ordinarily grown in the area. But he wanted to bring in some new things. He tried mulberry, unknown in the area, and succeeded. He took to sericulture and raised the best-quality seed cocoons in the district. And then the potatoes, not known in the area till then. Other farmers now go to him for guidance.

Byatarangappa's is a spectacular example of courage, perseverance, hard work and imagination. He succeeded in raising crops which others had feared to touch. He has generated a new spirit in his area. Not only has he prospered through his efforts, but has given a bold lead for others to follow.

### THE WAY TO HEAVY YIELDS

In the Bhur village of Bulandshahr in Uttar Pradesh lives a young farmer, Daresh Chandra, who raised a record crop of potatoes in the very first attempt.

He belongs to a happy family of farmers one of whom annexed the title of 'Krishi Pandit' in the All-India Potato Competition of 1951-52. The Krishi Pandit had raised 735 maunds of potatoes in an acre.

A few years later, young Daresh Chandra came very close to this mark by producing 703 maunds to the acre and won the first prize in the Uttar Pradesh State Potato Competition.

Daresh has graduated in Agriculture. When he completed the course, he took upon himself the management of the family holding of 15 acres, 11 of which were under orchard—mainly mangoes—and only four under field crops. He soon found that the holding was small to maintain himself and his brothers and, therefore, extended it by purchasing a few more acres.

He raised the prize-winning crop on a part of the new land. When it came to his hands, the land was full of *kikar* (*acacia arabica*) trees. He cleared the trees and started by growing wheat in the land. And, for entering the State competition in potato-growing, he selected a half-acre plot.

One of the first steps he took for raising potatoes was to grow in June a crop of *sanai* for green manure. To this he applied seven maunds of bonemeal. At the end of two months, in August, he ploughed in the *sanai*.

Daresh gave the land 12 ploughings in all with the *desi* plough. Then he made ridges, each at a distance of 14 inches from the other and at the turn of October sowed the seed with a spacing of about nine inches. He was careful in the selection

of the seed. His choice was the *Patna Red*,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches in diameter, which he sowed at the rate of 34 maunds per acre. The earthing-up operation was done 35 days after sowing.

The farmer had applied 500 maunds of farmyard manure before sowing, and just when sowing was about to be done, he added 22 maunds of castor cake and a maund of ammonium sulphate. When the time of earthing-up arrived, he put in three maunds of superphosphate, a maund of ammonium sulphate, 22 maunds of castor cake, a hundredweight of potash, a maund and ten seers of ammonium nitrate and two maunds of fertilizer mixture.

This is rather an extraordinary way of fertilization. According to Daresh himself, 'though it may appear unnecessary, I applied all types of manures to supply the major and minor good elements to the crop. In terms of the major plant foods, the manures supplied 499 lb. of nitrogen and 360 lb. of phosphoric acid and potash for the half-acre plot.'

The farmer was careful in irrigating the crop. In all, he gave it 14 irrigations during the five months of its growth period. There were no regular intervals between the waterings, which varied from 4 to 23 days, depending on the requirement. The water supply for the first irrigation was half an inch deep. For the second, Daresh doubled the depth to a full one inch, which he raised to two inches for the third. The fourth and subsequent irrigations were four inches deep.

In farming, as in other walks of life, caution at the right moment pays dividends. And Daresh understood this truth. As a precautionary measure against pests, he spread 20 lb. of gammexane over the field before sowing. He then applied bordeaux mixture, first before earthing-up, and four times more at intervals of 12 to 15 days. To kill aphids, he applied 'endrin' (19.5 per cent concentration) at one lb. in a 100 gallons of water during the first week of February.

The result of this good tillage, heavy fertilization and proper irrigation was the 350 odd maunds of potatoes from the half-acre plot. Daresh succeeded in beating other competitors by producing the heaviest yield. But are such operations, manuring, etc., a model for other farmers? In Daresh's view, such competitions give an opportunity to farmers to find out the extent

of the yields that can be obtained through better seed, heavy manuring, improved irrigation, etc. Normally, a crop of 500 maunds of potatoes per acre is economical.

What Daresh has done is to show to his fellow farmers the way to obtain heavy yields. He has set an example of how our lands, long described as low yielding, can be made to produce twice or three times the crop we ordinarily get. Some extra efforts and timely precautions are the two important factors that can lead to impressive results.

### A DETERMINED FARMER

Farming is a hazardous occupation in many parts of the country. One may have sown the best seeds and employed scientific methods of cultivation. But, above all, one thing is needed—constant vigil. Otherwise, months of hard labour might come to nothing.

It is not only the pests which are to be fought, but the seasons and the elements.

No one knew this secret more than sixtyone-year old Chanan Singh of Agwar Pona village in the Ludhiana district of Punjab.

In 1956 his record potato crop—over 750 maunds an acre—brought him the high honour of 'Krishi Pandit.'

The land was again under potatoes. The plants were as yet two feet high, and had still a long way to go to attain their full growth.

Chanan Singh's mind was full of forebodings, because, as the wind blew, he knew what was in store. There was frost two nights earlier, and he had saved the delicate plants by flooding the field with warm water. The frost now came more heavily, but the field was still wet so that another watering was not desirable.

The plants must be kept warm somehow. Chanan Singh did some hard thinking, and finally got his idea. He lighted fires along the windward side of the field and kept them going till

morning. He burnt his precious dung-cakes and wheat-chaff in order to save his tubers.

Many icy nights followed. The old man, wrapped up in sheets, kept awake night after night, watching every mood of the wind and weather in order to forestall the destroyer.

His neighbours laughed at Chanan Singh's methods, but he showed them that he knew what he was about. He got a bumper crop.

No doubt, it had not been easy for Chanan Singh continuously to battle against the frost to protect his crop. He has deep furrows on his forehead and worry-lines on his face—the price he has paid. But he remains as determined as ever to take the maximum out of the soil.

### CABBAGES WHERE NONE GREW BEFORE

It is not often that we come across a farmer who attempts something out of the ordinary and achieves it. One such is a young man, Dhirubhai Narainji of village Desra in the Surat district of Bombay. He grew cabbages in a locality where they were least known. And he got such good results—250 maunds per acre—that he secured the first prize for growing cabbages in the District Agricultural and Cattle Show.

Now, 250 maunds of cabbages from an acre is really good yield. But Dhirubhai adds a second string to his bow. To grow more from land is good, says he, but a successful farmer is one who also gets more money for his produce. He is an active member of the Kheti Vikas Co-operative Sangh Ltd., Gandevi. He sells all his produce—vegetables, bananas, mangoes, chikkoos, sugarcane—through the Sangh, and gets more money for it.

Dhirubhai ensures a good price for his cabbages and other produce by growing them well. He is one who leaves nothing to chance.

To grow the prize-winning crop, he first prepared a proper nursery to rear the seedlings. He set apart two gunthas of land for this purpose to which he applied five cartloads of well-rotted compost. In weight, the five cartloads meant some



5,000 lb. He pulverized the soil thoroughly with a *kudali* and prepared beds eight feet by three feet. He then gave the first irrigation. Rains came thereafter and kept the soil moist.

Dhirubhai sowed the seed in the month of June in lines which he kept three inches apart. In this way, he put in two lb. of seed in the two gunthas of the nursery. The seedlings were ready for transplanting in two months and a half.

In the meantime, the main field, which was of two acres, was prepared to receive the seedlings. The farmer administered to the plot a heavy dose of 80 cartloads of farmyard manure. He then ploughed the field thoroughly, nine inches deep, and repeated the ploughing five times. Two harrowings were also given.

When the soil was ready, he prepared seed-beds 12 feet x 6 feet in size. To these he transplanted the seedlings maintaining a distance of 15 inches x 15 inches. This was done about the middle of August.

Twelve days after transplanting, Dhirubhai enriched the field with a manure mixture of ammonium sulphate, superphosphate and groundnut cake. The proportion was 2 : 1 : 3. He applied the same manure mixture a second time eight days later, and a third time 20 days after the second. In all, he gave 800 lb. of the manure mixture in the course of 40 days from transplantation. In addition, he gave 400 lb. of superphosphate.

As for irrigation, he gave the first before transplanting and the second four days after. After the second irrigation, Dhirubhai dug the field with a *kudali*. He gave five more irrigations to the crop during its growth period, at an interval of a week.

Prize-cabbages were thus harvested from an area where none grew before. If Dhirubhai could grow such a heavy yield with little earlier experience, we may imagine how he fared the next time.

And cabbage is a wonderful vegetable. Indeed, among the green leafy vegetables it is supreme. It supplies the body vitamins, phosphorous and iron, and is, therefore, highly prized.

When a farmer like Dhirubhai Narainji produces a bumper cabbage crop, he earns for himself rich dividends. At the same time he earns the gratitude of the country to which he supplies his vegetables to enrich its diet. For, each person needs to consume every day at least four ounces of green leafy vegetables in addition to six of non-leafy varieties.

## SUCCESS WITH SUGARCANE

Choode Gowda, a farmer of Chickmagalur in the Chennapatna taluka of Mysore, has achieved extraordinary results in growing sugarcane. On a patch of four acres and 10 gunthas of land he has produced an unbelievable  $103\frac{1}{2}$  tons of cane per acre. Converted into *gur*, it gave 930 maunds (of 28 lb. each) per acre.

And, it was the first time he attempted to grow sugarcane on his farm.

When the agriculture inspector of the area suggested to Gowda to grow sugarcane, he was initially not very hopeful about the venture. And truly was it a venture. For, never before had sugarcane been grown by him. But Gowda is a progressive farmer who would hardly let a reasonable suggestion go without giving it a fair trial. So he and the inspector sat together one day and decided on a cultivation schedule.

The soil was a deep sandy loam, and moderately fertile. Gowda, known as Puttuswamy among his friends, spread 640 tons of tank-silt on the four acres and 10 gunthas. He then ploughed the land, first with a mould-board four times and again three times with a *desi* plough. The clods were broken with wooden mallets. Gowda used a double mould-board plough to open furrows two feet apart. He also opened the water channel 18 feet apart.

While the soil was thus being prepared, he looked for some good-quality seed. He selected *H.M. 419*, a high-yielding cane bred at the Government Farm, Hebbal, and got the supply through the Agriculture Department. In the month of July he planted the cane nine inches apart.

Puttuswamy put in an adequate quantity of fertilizer in order to achieve good results. The first dose—eight maunds of ammonium sulphate and as much of superphosphate for the entire area—went with the planting. After two months he weeded the crop and applied fertilizer again. This time he put in only ammonium sulphate—16 maunds altogether.

After five months it was earthing-up time. Puttuswamy saw the effect of fertilizers on the crop which was putting on a healthy green. At the time of earthing-up he, therefore, gave a heavier dose. He used 48 maunds of ammonium sulphate and

an equal quantity of groundnut cake. He rounded off the fertilization with 40 maunds of ammonium nitrate when the crop was seven months old.

The farm is fitted with an electric pump, which supplied water to the crop. Four irrigations were given in July. For the five months August to December, the crop was largely dependent on the rains, but whenever there was a break, Puttuswamy used his pump. From December to July, he resumed irrigations from the pump at intervals of eight days. In this way, the crop received 44 irrigations in all.

The crop put on a thick growth and Puttuswamy felt happy. He made his own estimate of the yield. But the month of October, when the crop was harvested, brought him a surprise. The yield surpassed his expectations.

Choode Gowda has been a farmer from the age of 16. But he had not thought of scientific improvements till a few years back. His per acre yield was low, but he was satisfied, because his acreage was large. For the four acres and 10 gunthas which he put under sugarcane is only the smallest of the four farms he owns. All the same, once he took to better farming methods and his income went up, he was eager for further improvements. 'No farmer can for ever afford to remain indifferent to improved farming methods', says Puttuswamy. 'We (obviously the farming community of Chickmagalur) are slow at it, but once we are convinced of the efficacy of a good method, we definitely go in for it and even for more.'

Farmers like Puttuswamy are playing a very important role in improving the state of agriculture in our country. They are conscious of their responsibility to themselves and to the community. Puttuswamy frequently meets other farmers and tells them of the fine results he gets out of the new measures introduced. He delights in saying, 'I am turning out into a good extension worker without being put on the pay rolls.'

### THE 'COCONUT KING'

In the 'coconut country' of Kerala is an island called Kodungallur (Cranganore). Surrounded by the Arabian Sea

on one side and the backwaters on others, this beautiful island comprises many villages lying on criss-crossing water channels, so characteristic of this area. On the island coconut is the main crop, which has a great deal to do with the people's well-being.

In one of these villages, Lokamaleshwaram, lives K. G. Sridhar Prabhu, whom some of his friends call the Coconut King. Kings may no longer be in fashion, but the name has not yet lost its old associations of courage and leadership. And it is these virtues which Prabhu exemplifies.

If he produced an yearly yield of some 14,500 coconuts per acre, where the average used to be no more than 2,100, who would not call him a king? Prabhu has increased production seven-fold. In doing this he has not brought about a revolution in cultural methods, but only improved them. He showed initiative.

When he first performed the 'miracle' in 1953, he said: 'I did the cultivation systematically, gave proper manure to the trees, personally supervised and helped in all the operations the year round.'

Prabhu offered a piece of land, half an acre in area, with 38 palms standing, for competition. The competition was jointly sponsored by the Indian Central Coconut Committee and the (then) Travancore-Cochin Government to provide incentives to farmers to produce more. Prabhu won, and got a cash prize of Rs. 500.

His plot was part of the land which was originally reclaimed from the backwaters. The trees had been planted on the bunds 40 years earlier. The plot received the same cultural operations as the rest of his holding. By far the most important operation was digging up the soil, heaping it into mounds and later flattening them up. It is a common practice.

Every year Prabhu cleaned the canals and earthed up the sides of the bunds. This is a traditional practice, but he added to its effectiveness by being personally present to see that the work was done properly.

In manuring also, while he kept to local pattern, he had his own ideas. He applied silt brought from the Azhicode Bar, at the rate of four baskets per palm in alternate years. This particular silt, though costlier, is of a higher manurial value

than the ordinary silt. He also applied farmyard manure at two tins and ash at one tin per tree. In alternate years, he fed each tree with 30 lb. of prawn dust and 20 lb. of groundnut cake.

In summer Prabhu took special care to irrigate the trees. He lifted water from the canals with baskets and let it into the basin dug round the farm.

There is nothing in these operations which is beyond the reach of any other coconut-grower in these parts. As Prabhu puts it, 'the attention paid to the palm is never a waste. You do so little to it and yet it rewards you handsomely.'

The prize-winning trees were originally planted on 15-foot wide bunds. As the trees grew up, the space between the bunds was filled up with soil. This spacing, which is common in the area, is not ideal. For a long time, farmers thought that with more trees in an area, its yield would be higher. But they did not know that overcrowding would not pay. Prabhu had a number of arecanut plants in his garden, which caused overcrowding. He knew that this was not ideal, but he waited for the arecanuts to put on some girth in order to get good return from their cut stems.

Prabhu is very careful with the trees that bear fruit. He knows the importance of selecting the right seed and seedlings for fresh planting. He does not take any risks in the selection and, therefore, raises his own seedlings, whether for underplanting or fresh planting. He is confident that 'even with seedlings the origin of which we do not know, we can make the best of a bad bargain. Good care and sufficient manuring can bring them up well.'

Other farmers in the villages of Kodungallur have learnt much from Prabhu. They now know that as the soil loses its fertility, and the trees grow old, the yields dwindle. The cultural and manurial operations, therefore, have to be done to suit given conditions.

This calls for a steadfast search for better methods of cultivation and more personal supervision to see that everything is done at the proper time. The coconuts require years of attention, but pay continuous dividends. Their gifts are many, —kernel for cooking and oil, shell for a variety of utility and

fancy goods, husk and fibre for making coir and mats, stem for fuel and timber, and leaves for thatching roofs of houses. It is, therefore, that the palm is looked upon in Kerala as a '*kalpavriksha*' (all-giving tree).

### AN ORCHARD OF FAME

Panyam is a village near Banganapalle in Andhra Pradesh. Here, over a century ago, a mango-lover planted a small garden with his favourite varieties. Today, the garden has grown into a first-rate orchard, spread over 372 acres of fertile black cotton and red loamy soil. Besides, there are 15 acres under a flourishing nursery where budding and grafting of fruit plants goes on unceasingly the year round. To Panyam, this orchard has brought fame. Its owner is P. V. Krishna Rao.

Climatic conditions in these parts are a very favourable factor for raising a good orchard. But there are other factors that have helped Rao in making the orchard what it is today. These are provision of good drainage and irrigation and a liberal use of fertilizers.

As Rao inherited the orchard, he inherited the experience of generations that had gone before him. To this, he added his own ideas. As a result, Rao together with his brothers, now produces quality mangoes and citrus, *sapotas* and *ber* in a number of varieties, which he sends to markets all over the country.

Besides manuring, ploughing is the most important intercultural operation in the farm, in the case of all fruits. The scientific methods which Rao follows are in evidence when one goes round the orchard and finds the soil in good tilth and without weeds. He reaps an average of 500 fruits per mango tree for about 40 varieties. One variety, *Neelam*, gives him two fruitings of as much as 3,000 and 2,000 respectively. *Jehangir* yields 15 fruits, each weighing a seer and a half on an average. In citrus, the different varieties average 1,000 fruits a tree. *Sapotas* yield 4,000 and *ber* three maunds of fruits per tree.

Rao's orchard is almost free from insect pests except for the fruit-fly. He easily controls the fly by dusting the trees with 5 per cent BHC or 5 per cent DDT.

What is interesting about the orchard is that Rao does not cultivate so much for obtaining high yield as for grafting. His daily average of grafting is 50 seedlings. Each year, he sells about a lakh of grafts and plants, and makes an annual profit of some Rs. 25,000 from the 15 acres. There are two important factors for his success : one, personal supervision of all important operations, and two, the cooperation of his brothers.

Krishna Rao and his brothers are now living happily, and theirs is a very important contribution. At the present level of production, the availability of fruits per head in India is as low as 1.5 ounces. We need much more to keep the people healthy. Fruit culture on a large scale is essential both for increasing the supply of protective foods and for bringing about greater diversification in agricultural production.

## MORE LAND UNDER THE PLOUGH

*India's population is growing at the rate of five millions a year. This means that pressure on land is steadily increasing, and that, in addition to intensive cultivation, we should bring all available land under farming.*

*There is in India a great deal of wasteland, which has not been brought under the plough. Reclamation of such land demands enormous toil, resources and perseverance. It requires modern equipment like tractors to clear the land and make it cultivable.*

*The Central and State Governments have been doing reclamation work in different parts of the country and, as a result, large tracts of additional land have come under various crops. Side by side, in many places, individuals have shown initiative in developing wasteland to extend cultivation. Wherever the work has been undertaken with vigour and determination, it has led to striking results.*

### A GREAT ENTERPRISE

One such example comes from a village called Durgapur, some ten miles from Kapurthala in the Punjab. Here is located the prosperous farm of Vishwanath Puri, with crops standing almost round the year. Passing through the rich fields today, nobody would imagine that what is so green and lush was, not long ago, a jungle waste dotted with wild shrubs and ponds and ditches. It was Puri's intense devotion to his work that has performed the miracle.

Puri inherited the land from his ancestors. It had remained neglected for generations. He had no farming experience himself. Indeed, he had started on a different career. He had a good Master's degree in Chemistry, and had done two years' post-graduate research work. Those were the post-partition



days, when the country was in the grip of food shortages. And Puri decided to take to the plough.

From the moment he took this bold step, he did not look back. His neighbours doubted and mocked, but Puri did not swerve. Fired with extraordinary enthusiasm, he began the task of clearing the land, cutting and uprooting the wild trees and grasses, and filling the ponds. In course of time, as the wasteland gradually emerged into a cultivable tract, the farmers who had earlier discouraged him became his admirers. They now met him as his friends, and he learnt his first farming lessons from them.

Reclamation of wasteland is a tough business demanding resourcefulness and hard work. Puri was not wanting in these qualities. He first used the traditional bullocks, but soon found the progress was too slow. He wanted to go faster. So he purchased a tractor. Things now began to move fast. More and more land came to be fit for cultivation in a short time.

This was only the beginning. Puri was determined to be a farmer in a big way. His must be an ideal farm which would fetch rich, record harvests. Therefore, he kept himself abreast of new methods and techniques by reading a number of agricultural magazines, and by taking the advice of the State agricultural department.

Puri's first yield of paddy, which he cultivated according to the Japanese method, was 30 maunds an acre. With proper irrigation and use of better seeds, he harvested the second crop with a 50 per cent increase. In about three years he perfected his methods so much that the yield was an incredible 84 maunds per acre and the variety was the local *Kala Jhona*.

Puri went on extending his farm. He produced a wheat crop of some 20 maunds to the acre which later went up to over 29½ maunds. This was more than double the average yield in the area. He won the first prize in the crop competition at the tehsil level.

One of Puri's most successful experiments was with cotton. His neighbours used to grow the local variety whose yield was low. They were shy to take to new varieties and even cautioned Puri to avoid experiments. But Puri wanted better return for his toil. He, therefore, went ahead with the cultivation of the

*American LSS* first on a half-acre plot. It was a surprise to his friends when the yield brought nearly 24 maunds to an acre. Their eyes were opened. People from far and near came to Puri's farm to purchase seeds.

The greatest surprise was yet to come. Puri wanted a double crop on his farm. Once again, he used his ingenuity.

In Kashmir, he had seen experiments being made with Chinese paddy of a short duration variety that ripened in two months. He got a small quantity of the seed and set to work. His first attempt was a failure but he persevered. The seed for the first crop was sown in April by the Japanese method. Transplantation was done after a month, and the crop was harvested in July. The yield was 51 maunds per acre.

As he went on harvesting the crop, he also started puddling the harvested portion. To gain time, which was very precious in such an endeavour, Puri puddled his fields with a tractor and tiller. This was done for the first time in the area. Earlier, in the third week of June, he had sown the seeds in the nurseries for the second crop, and they were now ready. Transplantation was completed by the first week of August. The crop was harvested in early October with 48 maunds to the acre.

Altogether, thus, Puri managed to get 99 maunds of paddy per acre of the field.

Puri's interest was not limited to a few tried crops. He went on exploring and experimenting in many crops and almost always got good results.

What was the secret of his phenomenal success? With green manuring, he combined modern methods of cultivation and use of better seeds and implements. Above all he was persistent and hard working in order to obtain higher yields.

Today Vishwanath Puri's farm is the pride of the whole area around.

### DESERT BLOOMS IN HARIANA

The region lying north of Delhi is known as Haryana, because it was once full of greenery. No one knows when it became a desert.

It is now a vast stretch of *khaki* sand with an occasional range of low hills cutting across. It has the poorest cultivation in the Punjab, based on well-water lifted by antiquated methods.

Haryana has the sturdiest peasantry in India, the Jats, Ahirs, Meos, Bishmois, Bhattas and Rajputs, but they cannot take much out of the land which gets a few drops of rain every year.

However, Shalu Ram of village Khawaspur decided to take upon himself the challenge.

He selected an acre of land alongside his well. And his battle began. He ploughed the land deeper than ever before. He knew the soil badly needed green manure. So he grew plants on the land and ploughed it back. Many maunds of manure—dung and chemical fertilizers—were added. He consulted the agricultural expert and bought the special variety of wheat seed No. 518 and sowed it. Thereafter, his camel sweated round and round the well to feed the thirsty land. Animals and pests were zealously kept away from the field.

All went well, and when the crop was harvested, Shalu Ram became a champion wheat producer. The yield was 77 maunds and 35 seers which won him the prize for a record crop.

### THE MAN OF DABRA

The most courageous man in Madhya Pradesh's bandit-infested hill tracts is sixty-year old Amar Singh.

He was for twelve years in the army and got two decorations for valour, and spent thirty years as a truck driver in Lahore.

Then came his most daring feat. After partition, he took 40 acres of barren kans land, and has, single-handed and without previous knowledge of agriculture, turned it into a most prosperous little farm in the State.

A mile beyond Dabra Mandi on the main Gwalior-Jhansi road, a small cart-track branches off into Amar Singh's farm.

Standing 6 ft. and 5 inches, Amar Singh has the vitality of a young man. He explains: 'I bought this land when kans grew six feet above and below the surface and there was no water. With the money I was able to salvage from Pakistan, I bought a tractor. The project people gave me a loan to sink a tubewell'

and buy improved seeds. So I ploughed, sowed and watered the land. You can see what it is like now.'

A half of his land grows sugarcane, and the other half is neatly laid out with plots of vegetables. He keeps a large number of buffaloes, cows and innumerable little calves on his farm. He lives in a thatched hut open on all sides. His only companion is a sturdy mongrel, Motu.

'The day starts for me before dawn and ends when the stars are in the sky. For many days I forget to bathe. It is hard work but it pays. This land keeps my four sons in college and school; one is now a doctor.'

### FROM POLITICS TO PRODUCTION

The story of Swarup Raju from Andhra Pradesh is a story of courage and imagination. He left politics and took over 140 acres of arid land and has converted it into one of the finest banana orchards in the country. His way to success was through the waters of the great Tungabhadra reservoir which is bringing a new life around.

Raju tells his story : 'Before Independence, I was a political worker and went to jail several times in the freedom movement. Now producing food is more important than politics.'

The land was ruined by erosion and flood, and Raju spent two years in clearing the scrub and levelling the ground. During this time, he had no return from the land. But as an educated man, he knew that when the waters from the Tungabhadra came, his land would bloom.

Then came the waters. Raju planted bananas, sugarcane, rice and vegetables, and looked after them with proper manuring, insecticides, etc. Today, he produces twentytwo varieties of bananas—some of the very best in India.

Raju has settled forty families on the farm, built them a school and a hospital. He is planning to train students who want to take to farming. Raju is now known in the entire district, and is the pride of the Community project block in Koppal.

## MORE INCOME FOR FARMERS

*Agriculture is an occupation which does not keep a person uniformly busy all the year round. There are periods when intensive toil is required, so that the farmer even needs to hire additional hands to do ploughing, sowing, weeding or harvesting. But there are periods when he has little work to do on the land.*

*There are many occupations on which the farmer can profitably concentrate in the off-season. Two such are dairying and poultry-keeping.*

*These bring many benefits. They not only help raise farm incomes. They increase the supply of milk, give meat and eggs for better diets, provide more efficient bullock-power for farming, and yield wool, hides and skins for a number of rural industries.*

*In regard to cattle and poultry, the basic problem is one of improving the stock.*

*The following examples of individual efforts in this field show how adoption of scientific methods and personal care can lead to very impressive results.*

## DAIRIES OF REPUTE

Long ago, during the days of the Civil Disobedience Movement in 1932, in a dark cell of a jail, an idea was born, which has since developed into a flourishing undertaking at Malad, a Bombay suburb. The British had thrown thousands of satyagrahis behind the bars all over the country. Among them were three young patriots, K. G. Patel, P. V. Mehta and B. J. Patel. While they were still in prison, they were faced with the problem of what they would do when they got out.

The three men considered many plans and finally decided on setting up a dairy farm. What had led them to selecting the milk trade was that, having been active workers of Patidar and Bardoli Ashrams they had some experience in the line. The plan for starting the farm was worked out in the jail.

On their release in 1933, they borrowed a couple of thousand rupees from friends and sympathisers and set up a small farm at Andheri. The beginning was humble; they had two buffaloes to begin with and they located the farm in a hired stable. The buffaloes gave them some 40 lb. of milk daily for their 20 customers.

Twenty years later, they were producing in their Adarsh Dugdhalaya 7,200 lb. of milk a day and giving home delivery to 2,000 patrons. The livestock population was 1,200 with some 500 persons to look after them. An unusually prolific rate of growth, indeed; it was the result of hard work and perseverance.

The partners had started almost from scratch, but from the very beginning they had set before themselves a lofty ideal—of supplying pure and clean milk to the customers. And a single year's careful work showed them that an honest living could be made out of the business.

As time passed, the business expanded. By 1940, seven years after it first came into being, the dairy was well established with 280 animals. It could no longer be accommodated in the original stable at Andheri. Therefore, a good site near Marve Road at Malad, another suburb of Bombay city, was purchased and developed into a proper farm. Gradually, as the animal population grew, more stables were put up. Alongside, residential quarters were also built for the employees who tended the flocks, and a road was constructed to link the farm with the Marve Road.

Most of the animals were raised at the farm itself, which is really creditable. The most predominant breeds are Murrah of buffaloes and Gir of cows, and they are all healthy. They are such good milkers that the average daily yield per animal is 14 lb.

To achieve this phenomenal success, the three dairymen worked at two ends—to rear the animals carefully, and to sell their produce in the best way.

To begin with, they selected the best animals for rearing. They set a standard of selection and adhered to it scrupulously. For example, only male calves whose mothers yielded over 7,000 lb. of milk in one lactation were reared for breeding purposes. Similarly, only heifers whose mothers showed a record of 5,000

lb. of milk in one lactation period were retained. And the daughter's milk-yield was compared with that of the mother to see whether there was any improvement in the yield in younger generations.

No doubt, this involved complex book-keeping, and maintaining of records. But determined as they were, the partners undertook all this painstaking work. They maintained records of all types, including the daily milk-yield of individual animals. As soon as slackness in the milk-yield of any animal was noticed, they took steps to arrest it.

It is not as if a good breed is sufficient to ensure a high yield. On the Adarsh Dugdhalaya, the animals are given nutritious feeds and in adequate quantity. They get cotton seed and pulses like *arhar*, *guar* and gram, oilcakes like coconut, groundnut and linseed and wheat bran. Among other feeds are hay, carrots, turnips, mangolds, lucerne, jowar and maize, according to availability. The animals are kept clean and the stables are washed twice daily. Phenyl and DDT are used liberally to kill the germs that might harm the livestock.

Milking of animals is completed early in the morning, and all the produce goes into the pasteurising chamber. After pasteurisation the milk is filled in sterilised cans, which are then sealed and sent to the various distribution centres in Bombay city and suburbs.

The vigilance of the partners does not end here. They have all along taken good care to see that their milk reaches their customers with the same purity as they despatch it. They supply to their customers cards to record daily remarks about the quality. A bad remark brings punishment to the delivery man, while satisfactory remarks bring him extra reward.

While they tend their milch herds tenderly and affectionately, the imaginative farmers have good use even for dry stock. Generally, producers of milk do not attempt to salvage dry cattle to bring them back in milk. But in the Adarsh dairy, a large number of such cattle are maintained with good care and brought back to milk instead of being sold for a trifle.

On a huge 500-acre farm of the dairy at Palghar the dry animals are kept and a sort of mixed farming is done with emphasis on dairying. Some 50 acres are devoted to growing fodder grasses, while on 400 acres good quality grasses are grown

for hay. Thus, in addition to feeding its own cattle, the dairy is doing a flourishing trade in fodder. This has added to its income.

Anyone who visits the Adarsh dairy gets the impression that it is being run scientifically and in a spirit of service. Adarsh is doing a great service to the country by supplying clean, pure milk to a large number of people. Besides, it provides employment to many.

India has the largest livestock in the world, but the milk supply is very low. The main reason is ignorance of proper maintenance of cattle. Breeds of all types are allowed to multiply; as a result, cattle, instead of being an asset, become a liability. It is a vicious circle. The cattle are maintained on low standards which lead to low yields and back to low standards. Good dairy farms like the Adarsh show the way how to improve our stock and make cattle an important source of rural income.

\* \* \* \* \*

Meet another successful dairyman, Ram Narain Sharma, whose farm lies on the outskirts of the historic city of Gwalior. The dairy section of his mixed farm is truly a dairyman's dream.

Apart from some Murrah buffaloes, Sharma's herd comprises well-bred Sahiwal cows—robust in health and uniformly attractive in appearance. A cow or a buffalo on the farm yields, on an average, 3,090 lb. of milk per lactation. Indeed, the yield in certain cases is very much higher, nearly double the average. For a cow, the highest per lactation has been as much as 7,500 lb. and for a buffalo 6,000 lb. Sharma is so fastidious in maintaining the yield high that any cow giving less than 3,000 lb. per lactation is removed from the farm. And he has on his farm cows and bulls that have won prizes in various cattle shows.

Sharma has his 'secrets' of success which he cheerfully shares with others. He believes in adequate and balanced feeding and plenty of exercise for the animals. Each animal, kept in clean surroundings, gets a maintenance ration of three pounds of concentrates daily. The animals in milk get the ration at an increased rate of one lb. for every four lb. of milk yielded. Sharma has fixed dry fodder per animal at eight lb. and also gives them minerals.



When the vegetables from the fields have been harvested, the animals are let loose in them. In this way the animals get green feed and good exercise. There is an added advantage; Sharma does not have 'to carry their dung to the field' for manure.

Before milking, both stables and animals are washed thoroughly. This imaginative farmer has his own way of preventing adulteration before the milk is delivered to the customers by delivery men. He has clean double-lid milk cans which he locks after filling. The milk is poured out to the customers through a tap fixed at the bottom of the can.

Many years ago, while he was strolling by the spot where the farm stands today, he realised that the city sewage passing by its side and going waste by the streamful could be put to good use. The idea caught his fancy.

Being an educated man he consulted magazines, journals and books to learn agricultural operations. He also met from time to time fellow-farmers and learnt from their experience.

In 1935, he purchased 16 Sahiwal cows and eight Murrah buffaloes, to start a small dairy farm. From then the farm progressed steadily. Experience gave him new ideas and every success made Sharma more and more devoted to his work.

Twenty years later, Ram Narain was doing flourishing business selling 20 maunds of milk a day.

### POULTRY CAN BE PAYING

Ajmer is known for its poultry and poultry-enthusiasts. One of the veteran poultry-keepers here is N. C. Joseph. For him it is a paying hobby. Besides providing him and his family plenty of excellent nutritive food, it gives him extra income, which is always welcome. Even their droppings are used as manure for the kitchen garden. Joseph has developed poultry-keeping into an art and has won several prizes. Indeed, he has succeeded in beating in competition imported stock by his own chickens.

Poultry-keeping is often hazardous. Not so for Joseph, but he says that he does not own any magic wand. Only, he has followed the golden rule 'to devote personal attention and care'

to the flock. This rule is born of his experience over two score years.

When only eight years old, Joseph was initiated into poultry-keeping by his mother, herself an enthusiast. She entrusted all her birds to the care of the boy. Before long, he justified her confidence in him—the flock won the second prize in a local poultry show at Ajmer. This encouraged him, and he began dreaming of rearing a quality flock of his own.

Poultry was a hobby for Joseph who, in course of time, joined service in the Railways. From his very first pay he purchased a set of eggs of White Orpington from which he hatched the chickens that were to beat the imported best in Ajmer. Thereafter he became a member of the Indian Poultry Club and went on annexing prize after prize in several all-India poultry shows. For, he always adhered to his golden rule and was meticulous in his care of the tender birds.

Joseph knows that no poultry can be worth while unless the chickens are given a good start. He feeds his chickens on skim-milk, good quality cereal grains and hoppers filled with mash, till they are at least three months old. He keeps the grains under clean and deep litters for the chickens to feed and get exercise at the same time. As soon as the sexes can be distinguished, he separates the female from the male, lest they should be bullied.

Joseph is a fastidious keeper and does not tolerate any undesirables in his flock. Drastic culling is necessary, if we are to raise a good farm; Joseph keeps the best birds and gives them the best care.

To maintain the best birds in the best way is to keep them healthy. Their dwellings must be clean, free from worms or ticks, and sufficiently roomy and airy. The corners of the cages are often the ideal spots for harmful worms to breed. Joseph has an easy answer to this. He disinfects the corners at least once a week, with kerosene and phenyl in 50 : 50 proportion. This costs him but a little, yet keeps off such deadly diseases as the ranikhet, the nightmare of poultry-farmers.

When at night he visits the cages to see whether the crop of eggs is full, he also makes sure that the birds receive adequate food to save them from possible night starvation. The last feed of the day is important.

It does not take Joseph to be a veterinary doctor to detect the sick birds at a glance. In the morning he inspects the flock, and he easily finds them out—they have their tails downcast. The sick birds are immediately segregated from the healthy ones. If the sickness is serious enough, he does not hesitate to destroy them in order to save the others. He checks the droppings frequently to see if the birds are suffering from any internal worms. He also ensures that the birds do not lose weight.

\* \* \* \* \*

The golden rules of Joseph are, indeed the golden rules of every serious poultry-farmer. Whether it is H. S. Bhatia of Delhi or Mrs. Myrtle N. Kelawala of Poona, they follow the same methods.

Bhatia who owns the 1½-acre Bhatia Poultry Farm with over 750 birds including 150 layers, is always ready with his syringe and needle to give the sick bird a penicillin injection or whatever treatment is required. Ranikhet vaccination is regular routine with him, and he gives his birds gammexane-mixed sand baths.

Bhatia is a careful feeder. At 6 a.m. he gives his birds *dara* mixture (containing cuttings of wheat, barley, jowar, etc.). At 11 a.m. they get mash containing groundnut cake 40 per cent, maize flour 10 per cent, maize glutenmeal 20 per cent, *chokar* 15 per cent, meatmeal five per cent, bonemeal five per cent, sea-shells three per cent, and common-salt and shark liver oil one per cent each. Greens are given at 3 p.m. Generally these comprise *palak*, discarded vegetable leaves from the market, or berseem, according to availability. The fourth feed comes at 4 p.m. which consists of meat offal mixed with *chokar* at two oz. per bird. The last feed, given at 6-30 p.m., is maize, whole or cuttings. Throughout the day, Bhatia gives them buttermilk.

The feed is given to the birds in hoppers, which are cheap and simple in construction. The birds drink water from a device that prevents them from stepping into it and making it dirty.

\* \* \* \* \*

Another successful farmer from Delhi is Sardar Jagat Singh, reputed in the Capital's hotel circles for his excellent table eggs. Jagat Singh had a shaky start in poultry-keeping, but he persisted. He is a shrewd businessman who keeps his production cost as

low as possible, without impairing his flock. The feedstuffs he uses on his Kingsway Poultry Farm are sweepings from flour mills, *mamni* and maize ground together and a liberal quantity of greens. Among other feeds, mash, crushed bones, meat offal and grit figure in his schedule, according to the requirements and the season.

\* \* \* \* \*

Mrs. Kelawala, who has all the important breeds in her backyard—the Leghorns, Rhode Island Reds, Wyandottes, Orpingtons, Australorps and Plymouth Rocks—believes that 'poultry chores are such as can be fitted into the day's programme of any housewife'. Though she has engaged a couple of poultry boys to help her, she takes a personal care in the rearing of her proud flock. Mrs. Kelawala has an interesting method of dociling her birds which may otherwise take to frequent fighting. She has taken to caponizing the birds; she injects a female hormone tablet in two to three-month old birds. The advantage is that the birds leave off fighting, which enables her to keep more birds in a single pen. According to her, caponized birds do not put on tough meat but quickly increase weight.

There is always good money in poultry, if one knows how to make it.

## VILLAGES REMADE

*If individual initiative is decisive in raising farm output, collective efforts are necessary for the advancement of the rural community as a whole. The aim of India's rural development programme is to put the villages on a basis of self-help. Wherever the people have pooled their energies and skills, whether it be on the sinking of wells or canals, the raising of bunds, the laying of roads or the building of schools, they have achieved phenomenal success. In several cases, a whole village is remade or an entire village community is stimulated into a new life of constructive endeavour.*

### NEW BORUNDA

Sixty-five miles from the city of Jodhpur, in the Bilara Community Development Block, lies the village of Borunda. Anyone who may have visited the village some seven years back will not now find the old Borunda anywhere. In its place has risen an entirely new village enjoying amenities which are generally the features of big cities.

The new Borunda is almost wholly the result of the initiative and self-reliance of its some 3,500 inhabitants. A resolute local leadership took them forward.

Borunda falls in the heart of Marwar which has sometimes been called 'the region of death', because of the acute scarcity of water all around. Here, precious water is today flowing all the 24 hours through taps installed in the houses and streets. The water comes from a well 120 feet deep, drawn by diesel engines. The inspiring story of new Borunda is largely the story of this well.

As late as 1951, Borunda depended for its drinking water on another well which was operated by bullocks. It cost the village no less than Rs. 4,000 a year, from its scant earnings, to maintain the four pairs of bullocks and to lift water from the well. For ages the people had known no crops other than the

khariff crop of bajra or jawar, if the heavens were kind. For when there was not enough water to drink, where could the villagers find it to irrigate their fields? Sometimes, when there was no water in the well and the bullocks were free, the villagers used them to sow wheat or barley and abandoned themselves to the mercy of the rain god.



They have suffered before from the whims of the rains, but no more. There is water around, and they now know how to lift it through tubewells.

In Borunda, as in most villages of our country, there is a Panchayat and a Sarpanch. The Sarpanch was Chandi Dan, a progressive farmer.

It was Chandi Dan who set the wheels of progress in motion. He sank a well of his own in the village and installed a diesel

pumping set to draw water. When the water first gushed out of the well, the whole village, young and old, came out to see it creep forth to irrigate, for the first time, some 200 bighas of land in the village. Soon Chandi Dan installed a second pumping set on the same well. To the amazement of the villagers, the water level in the well did not fall even when the two sets were pumping out 30,000 gallons per hour.

The old aridity of Borunda now gradually changed into pleasant greenery, infusing a new faith and a new life in the hitherto withered villagers. Chandi Dan wanted to pump out more and more water. No doubt, the first two sets had yielded good results, but they were proving costly and undergoing serious depreciation. He, therefore, embarked upon what at first appeared to be a daring feat. He planned to instal an engine, a direct one, coupled with a water pump, 115 feet below in the well. On his own initiative, he began the work, but soon the villagers joined him. They constructed an underground chamber, 18 × 20 feet, some five feet above the water level in the well. Here they installed the new engine with a capacity of 75,000 gallons per hour.

From this magic well prosperity is now flowing into Borunda, which is today one of the greenest spots in all Marwar. More than 1,500 bighas of the villagers' holdings, almost all consolidated by themselves into single blocks, produce rich crops, like wheat, gram, cotton, sarson and rai. Water from the well reaches the distant fields through a six-inch pipe-line, running 3,000 feet, which the villagers have themselves laid, and through channels which they have cut even across deep rocks. Through another pipe-line, 6,000 feet long, the unfailing well supplies the villagers fresh drinking water in streets and in their houses. The project cost Rs. 15,000 of which the villagers contributed as much as Rs. 10,000 and obtained the rest from the Government.

This is not the end of the story of change that has come over the village. The unfailing water from the well has stimulated in the villagers a devotion to hard work for an increasingly prosperous life. The village land that was once too much for them has now become too little to meet their needs. They have, therefore, reclaimed a vast tract of land which used to be inundated during the rainy season. This was a low-lying area, known

locally as 'Sar', about a mile outside the village. With their combined efforts, the villagers dug out an old, existing canal which empties the area of unwanted rain water. The new land is generally under dry crops like wheat and gram. In order to produce high yields improved varieties of seeds, better implements as well as fertilizers are used.

The growing prosperity of Borunda has helped the villagers to free themselves from the clutches of money-lenders. Indeed, one of the village Mahajans was himself so much moved by the new change that he voluntarily wrote off about Rs. 15,000 lent out by his father.

If they have freed themselves from the Bohras, they have also freed themselves from many wasteful rituals and funeral feasts. The lead was given by a backward class (Raika) woman, who donated Rs. 500 to the Panchayat; she desired that the money that would otherwise have been spent on 'mosar' after her death be utilised in constructing a building for a dispensary. A Rajput followed this noble example and donated as much, with the consent of his ailing father. With collections like these, the village was able to provide itself a Panchayatghar, a public park, a pavilion and an extension of the middle school. The enthusiastic villagers have even donated 50 bighas of land to the school for giving training in agriculture.

Neat and clean houses have now risen where there used to be dirty mud shelters. Even the Raikas, a proverbially poor class of sheep and camel breeders, have built pucca houses and compounds for their livestock which has multiplied with the expanding grazing facilities.

In a village where till recently time had no use or value, the people having nothing to do, there is at present hardly any time to idle away. A large proportion of the people are engaged in agriculture. Some of them are employed in stone quarries and lime kilns, while others are engaged on handlooms and in blanket making.

Among the future plans of this prosperous village, some of which are already under way, are the building of a Harijan Colony and a Godia Lohar Colony, with Government subsidy. The old community well is to be put to use for supplying drinking water. It has already been converted into a sanitary type.



with bathrooms fitted with taps and showers. The engine installed in it is also to produce and supply electricity to the village on a co-operative basis. The village Panchayat has plans of constructing a dam to store the water of the *nallas* that fill during the rains. The water is expected to irrigate another 25,000 bighas and help in bringing a still larger area under dry cultivation.

The example of Borunda is one of the most inspiring of people's endeavours to lift themselves out of poverty, despair and ignorance. Borunda has shown in a practical way the truth of the saying that "God helps those who help themselves".

### A PROGRESSIVE VILLAGE

Borunda is only one of the numerous villages in our country which are breaking away from the past and are pooling their energies to create opportunities for a new life.

Another notable example comes from the village of Umberkheda, 11 miles from Chalisgaon in Bombay State. As the visitor arrives in the village by the State transport bus that runs there a couple of times a day, he is greeted by broad, well-kept roads. And, the rooms of the bus stand which is in the centre of the village have in them many pictures and photographs, which tell the story of the achievements of the villagers.

The crucial man in the story of Umberkheda is Keshav Hari Wani.

Wani had the spirit of progress in his blood. As early as 1946, he offered his 22 acres and 12 gunthas of land to the Department of Agriculture to run agricultural demonstrations. This was the beginning for many improvements in the village which followed in quick succession. The first major development to come was the bunding, which the farmers themselves individually put up for their fields. Later, the village received a Government grant of Rs. 10,000 for putting up contour-bunds. Within ten years of Wani's having offered his land for demonstration, the village had contour-bunded 800 acres of cultivated land in the village, and work was progressing on the remaining portion.

Moved by a faith in collective efforts to improve their lot,

the villagers formed the Pat Bhandhara Society. The Society has brought every year after its inception 75 acres of additional land under irrigation at a low cost of Rs. 15 per acre.

In Umberkheda, there is not a single farmer who does not now own a cattle manure and compost manure pit, into which village sweepings find their way. Indeed, in this model village, all that makes other places dirty is used to good purpose by careful processing into manure. On the outskirts of the village have been put up trench latrines which make available manure for use in crop growing. The multipurpose society in the village has also constructed a silo pit.

The crops raised in this village have won several prizes for their high yield. The farmers have been able to achieve this largely through simple improvements in agricultural operations. For example, ploughing of the fields soon after the *kharrif* crop is harvested is now a normal routine for the village. When dibbling of crops was recommended, Wani tried it first with jowar and reaped a good harvest of 82½ maunds. Next year he doubled his efforts and produced an acre-yield of 140 maunds. More and more land is now being sowed by the dibbling method, whether it is jowar or cotton or paddy.

Paddy is mostly cultivated by the Japanese method so that the village has been able to annex the prize for the highest acreage of paddy in a village under the system. The total produce has gone up so much that the farmers needed a grain bank and an improved *ghani*.

The progressive villagers of Umberkheda are aware of the importance of good cattle. The village breeds its own cattle with only premium bulls and the scrub bulls are castrated. Each fortnight the veterinary doctor visits the village to look after the health of the animals.

With mostly their own money, the inhabitants of Umberkheda have, through their Gram Panchayat, constructed over 5,000 feet of pacca gutter, a number of trench latrines, and a pipe-line for pumping out well water. There are also a cooperative credit society, a multipurpose society, a consumers' co-operative, a lift irrigation society and an Ayurvedic dispensary

in the village. Each is playing its role effectively; the village has no difficulty in finding improved seeds, manures or implements, or finances for establishing cottage industries. In fact, the villagers have been enjoying such prosperity that, with their own donations, they have constructed a Central Chavadi, an impressive Shiva temple and a hostel for students. The village also owns a community listening-set. Adult training classes not only among men but very extensively among women is another feature of the village.

The villagers of Umberkheda have taken long strides forward through their own initiative. They have helped themselves to a better living and have helped the Plan.

### TWO MEN OF DULLEY

Dulley is a village in the Ludhiana district of the Punjab.

In 1954, it was declared the best village in the block; in 1955, the best in the district; in 1956, the best in the State.

Dulley owes this distinction to the initiative and dedicated work of two men : Mahinder Singh, a schoolmaster, and Harnam Singh, a merchant.

Mahinder Singh had taken a degree. He has had two interests—Persian and Urdu poetry, and social work. He spent all his time holding evening classes, and getting the villagers to build a school and a community centre. He has a large family of ten children, and he wants each one of them to do social work.

He had no land and money, but was known as a man with a vision. He was, therefore, chosen as the leader, Sarpanch, of the village.

Under his guidance, Dulley embarked on a whole series of development programme. It paved its streets, raised street lamps at all corners, built a community centre with a reading room, set up a weaving centre, started a primary school, laid a children's park, and finally built a large school for its girls and those of thirteen neighbouring villages.



Roads bring new life to the villages. Men and women have already come forward to lay thousands of miles of roads in India's rural areas through voluntary labour.

Harnam Singh had a chequered career as a merchant, and had finally returned to his village Dully. He has brought about a revolution in the farming practices of the villagers.

He set an example. He chose a sandy *pampas*-infested tract for his experimental farm. He cleared it, and enriched it with green manure and fertilizers. When the field was ready, he planted a large variety of mango cuttings. Within a few years the farm was growing 38 varieties of the succulent fruit amongst his 330 trees. He made each tree give birth to 200 saplings which he sold for two rupees each.

He also planted oranges, lemons, guavas and pomegranate on his farm.

When there was no more room for trees, his mind worked in another direction—a poultry, where he reared Leghorns, Rhode-Islands and Hampshires. Harnam Singh, no doubt, made plenty of money, but like the schoolmaster he had a purpose—to encourage people to build orchards and poultry farms to take the load off the meagre land. And he has succeeded, for the villagers are following his methods, and agricultural production in Dulley has shot up.

Thanks to the lead given by the two men, Dulley has now everything it needs—amenities for its men, women and children, and enough food to go round.

### SAGA OF THE SEHANI WELL

To all appearance, the new well at Sehani, a village in the Meerut district of Uttar Pradesh, about sixteen miles from Delhi, looks like any other well. It is deep, as most wells are in the area; and, its water tastes sweet and fresh.

What makes it different is the manner in which the well came into being. It was dug—all the sixty odd feet of it—by a team of four women, on their own initiative. It was dug with their own hands, and in the face of derisive laughter from the men-folk.

The saga of the Sehani well is the story of courage and determination shown by an ordinary housewife, 23-year old Brahma Devi. Her inspiration was an old well in her father's house in Khurja. She and her sisters had grown playing and working around that well.

But things were different when she came to her father-in-law's house in Sehani. The house stood among a group of huts on a mound a little removed from the main village; and the nearest well was two furlongs away. Brahma Devi wanted a well near the house.

When she talked to her husband about it, he laughed: 'Why, if you want it so badly, go and dig it yourself'.

This is precisely what Brahma Devi decided to do. She talked to her friends about it, Parmali and Shivdeyi next-door, and Chandravati from the house opposite. 'We will do it. We will show these men', they decided.

The four friends chose an auspicious day for starting their little project. Paṇḍitji, the oldest man in the village, was called to bless it. And, one fine morning, when the husbands were away in the fields, the digging started. The four women sweated away the whole day. In the evening, when the men returned, they were surprised to find an eight feet deep hole where there was level ground in the morning. But they still refused to regard the whole thing as anything but a joke. 'These women will soon get tired of it all', they said.

They could not be more wrong. The hole got deeper and deeper as the days passed—thirty feet, forty feet, fifty feet. It was now a familiar sight in the village—these four women digging away; two of them going down by turns, the other two pulling up the earth. Soon, the children who collected to watch began to help. Some more women joined. But even then the men remained haughtily away.

On the twentieth day, Brahma Devi and Shivdeyi, who were digging at the bottom of the pit, struck water. It came gushing out, fresh and cold, and tickled their bare feet. The children shouted, the word went round and men returned early from the fields to watch and applaud.

Next day, people came from the Community Development Block headquarters at Loni. They were delighted. The entire village was excited. Hurriedly, the Panchayat met and unanimously voted to raise a sum of Rs. 800 needed for cementing the well. Another Rs. 600 came from the people of the block. 'This', as the Block Officer explained, 'is no routine grant. It is our tribute to these simple women'.

## APPENDIX

The Japanese method of paddy cultivation, which has led to extraordinary results, is not a complex method. It is well within the capacity of the Indian farmer.

The first thing to do in this method is to plough the field soon after the previous harvest is over. This is meant to expose the lower layers of the soil to the rays of the sun. A green manure crop is then grown and ploughed under. In Japan the crop is usually cut and dried for three or four days before it is ploughed into the field. Both operations have been known in India for long; only they are not practised widely.

The principle involved is simple. The food we take from the soil, in the form of crops, needs to be put back in one shape or another. In India, many generations of farmers have drawn on the same land, without putting enough back into the soil.

There are ways to enrich the soil and keep it productive for all time. One is green manuring, which is suitable for many soils. Green leguminous plants, roots and leaves, when ploughed under, decompose and make the soil porous and sponge-like. In such soil air moves freely and water is absorbed. The decomposed matter adds a great deal of nitrogen as well as a number of minerals to the soil. The most useful legumes are *sanai*, *dhaincha*, *berseem*, *methra* and *khesri* and pulses and beans like *urd*, *moong*, *guar*, *lobia*, *kulthi*, *arhar*, *masur* and *matar*.

After the soil has recovered some of its lost vitality, it needs to be further enriched by applying compost or cowdung. The next operation is to plough again and turn the manure under.

While the field is thus being made ready for the crop, the seed-beds need to be prepared. According to the Japanese system, these should be four feet wide, raised three inches high, with each bed one foot away from the other. Such beds promote the growth of seedlings in a loose and pulverised soil, and facilitate inter-culturing and drainage of water.

On these beds is applied finely-sieved compost manure in a layer about one-eighth of an inch thick which enables the roots of seedlings to remain in the top-soil, facilitating easy pulling

out for transplantation. Ash is then spread in a thin layer and the beds are covered with yet another thin layer of fertilizer.

Meanwhile, the seeds to be sown are selected. They are poured into salt water and the useless ones which float on the surface are skimmed off. Water from the washed seeds is then drained out. The Japanese farmer soaks the seed in water for a week or 14 days before sowing. Generally, slightly germinated seed, when sown, gives better results.

The seeds are also soaked in 'agrosan' solution for 15 minutes and dried in a partly shaded place. The seeds are now ready for sowing, either in lines or broadcast. Sowing is done at the rate of seven seers per acre of the main field. Thin seeding is good for getting sturdier seedlings.

When the seeds have been sown, the farmer has time for repairing the field bunds—filling the cracks and holes.

The field now needs further attention. It needs some more food, which should be in the form of about 20 cartloads of compost or other organic manure to an acre.

In the meantime, the seeds sprout into seedlings which should be protected from insects by spraying.

The main field which has been puddled needs to be fed on another 200 lb. of fertilizer mixture per acre. This makes the field ready to receive the seedlings.

The seedlings are lifted off the seed-beds carefully and gently without damaging the roots. The soil clinging to the roots is washed and not knocked off. The seedlings are then planted in the main field, ten inches apart, in straight rows ten inches wide. The number of seedlings in a bunch, and the spacing between plants and rows are, however, not uniform. For example, at certain places six to eight seedlings and at others three to six seedlings are put. Similarly, in certain areas a distance of eight inches is kept between the rows and between the plants, depending on the requirements of the soil. While planting, care is taken to hold the seedlings along the fingers. The fingers are pushed into the mud, which leaves the plant standing straight up.

It is commonly held that line-sowing costs more. This notion is erroneous. Farmers have found from experience that line-sowing in fact requires less labour, provided one knows how to do it.



After two weeks of transplantation, the fields are weeded well. At the end of a month, the seedlings are found to be showing good growth. At this stage, 200 lb. of fertilizer mixture is applied again and is worked around the roots by hand. In every 15 to 20 days, the soil is loosened with a convenient tool.

On account of heavy rainfall, or for some other reason, the plants may bend and the earheads, if steeped in water, may decompose. To prevent this, ropes tied to sticks at regular places in the field are used to rest the flattened plants on them.

This is about all that is required to be done to grow more by the Japanese method. It does not involve the use of any costly foreign equipment and can be followed by any industrious farmer.

The secret of success mainly lies in raising sturdy seedlings, adding adequate organic manures and fertilizers and taking care in the preparation of the fields. Inter-culturing and weeding also play an important part. The labour is well rewarded.

The Union Ministry of Agriculture has collected statistics in respect of the average yield per acre by local as well as by Japanese methods of paddy cultivation for different areas of the country.

According to these data, for the year 1955-56, in Uttar Pradesh the average yield per acre by the local method was 24.38 maunds of paddy or 16.19 maunds of rice. For the same year, in the same area, the average yield by the Japanese method was 30.94 maunds of paddy or 20.63 maunds of rice. Thus the increase was of the order of 6.56 maunds of paddy or 4.44 maunds of rice. In Bombay, the figures were : by the local method 23.4 maunds of paddy or 15.6 maunds of rice; by the Japanese method 37.5 maunds of paddy or 25.0 maunds of rice, the difference being 14.10 maunds of paddy or 9.40 maunds of rice per acre or an average.

The maximum additional production of 44 maunds of paddy or 27.8 maunds of rice was obtained in the same year by Hyderabad. In Kerala, the additional production was 30.50 maunds of paddy or 20 maunds of rice; 26 maunds of paddy or 17.33 maunds of rice in Orissa; 27 maunds of paddy or 18.33 maunds of rice in Bihar; 20 maunds of paddy or 13 maunds of rice in Rajasthan. The lowest additional production was in the

case of Madras, being 1.6 maunds of paddy or 1.06 maunds of rice. This is easily explained. In Madras paddy cultivation is already of a high order and even by the local method the yield in 1955-56 was as high as 32.55 maunds of paddy or 21.7 maunds of rice per acre.

During the year 1953-54, the estimated cost of cultivation per acre in Uttar Pradesh by the local method was Rs. 115 and by the Japanese method Rs. 204.00. As against this, the increased return per acre in terms of money, by the application of the Japanese method was Rs. 96. In Bombay the increase was much higher at Rs. 349. The estimated costs were by the local method Rs. 119.25 and by the Japanese method Rs. 304.12. Some other figures are : Hyderabad, cost by the local method was Rs. 163.25, by the Japanese method Rs. 202.57, increase in return Rs. 216; Kerala, cost by the local method Rs. 164, by the Japanese method Rs. 303, increase in return Rs. 220; Bihar, cost by the local method Rs. 100, by the Japanese method Rs. 250, increase in return Rs. 350. With minor differences here and there, the pattern holds good for almost all areas. In Madras, where the increase has been the lowest, cost by the local method was estimated at Rs. 80.50 and by the Japanese method Rs. 138.50, the increase in return being Rs. 82 per acre.

Thus, while cultivation by the Japanese method costs relatively more, it brings in a return much larger than the increase in cost.



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