EVALUATION REPORT ON

PEDDAGUDEM LIFT IRRIGATION PROJECT

Funded by

CORTEVA™ agriscience

Co-Funded by

RAMKY GROUP
Towards sustainable growth
RAMKY ENVIRO ENGINEERS LTD.

Executed by

RAMKY GROUP
Towards sustainable growth
RAMKY FOUNDATION

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EXECUTIVE SUMMARY

Agriculture is the most vital sector and it plays a key role in the development of any nation. It is the responsibility of every Individual, Community and Corporate to play their part in supporting the Agriculture sector and work towards the well-being of farmers. Thus, as a part of its social responsibility **Ramky Group**, has been managing Natural Resources and have been working on different elements of it through Ramky Foundation, the Group's CSR Wing. Since its inception, RF in association, with its Corporate Partners, has been relentlessly working with farming communities and executing various projects for their benefit across the country. One such Project is the Peddagudem Irrigation Project, which was executed by RF, in association with **Corteva Agriscience** as its main funding partner and **Ramky Enviro Engineers Ltd. (REEL)** as its co-funding partner**.**

The project was exactly a boon to the farmers and we take pride in completing the project way before the timelines in spite of numerous challenges. The completion of the project within 41 days ensured the availability of irrigation sources at the right time to the farmers.

On the onset of this occasion, **Ramky Foundation** expresses its heartfelt gratitude to the **Honorable Minister Sri S Niranjan Reddy** for his exemplary leadership, his passion to serve the society and for giving an opportunity to be a part of this noble cause. We extend our Thanks to **Corteva Agriscience** for coming forward in funding this project. And, our special Thanks to **Ramky Enviro Engineers Ltd. (REEL)** for providing us with the timely support in completing the project.

We hope this project as expected would address the agrarian crisis on the farmers and increase their socio-economic status, thus leading to integrated village development.

- M V Rami Reddy
Head - CSR

CHAPTER I

INTRODUCTION:

The Importance of Agriculture goes way beyond than just contributing to national economy and ensuring food security. In a global scenario there are numerous underlying factors which are affected by the Agriculture sector and any disruption to this sector would have a multiplier effect on global economies. Agriculture plays a crucial role in providing employment, supplying raw and finished material for industries, Infrastructure development for quick and easy transport, source of foreign exchange by exporting agricultural products, development of banking sectors and many more[1]. According to World Bank, Agricultural development is one of the most powerful tools to end extreme poverty and is expected to feed 9.7 billion people by 2050[2] across the world. Hence, it can be said that Agriculture production and fiscal discipline are essential for a nation to sustain a stable economic growth.

In the Indian scenario, the facts and figures have been quite ironical. Though the contribution of Agriculture to country's GDP is only 15.4% in 2018-19[3], it is much higher than world's average (6.4%). With $375.61 billion of agriculture activity India stands second in the agricultural production and accounts for 7.39% of worlds total agricultural output. According to research studies by World Bank[4], 70% of global water resources are used for agriculture and it is estimated that for 50 % increase in agriculture production by 2050 there would be a 15 % increase in water withdrawals.

1.1 Irrigation & Current Scenario:

The most vital inputs for Agriculture production is Water and is available either through rainfall or by irrigation. The process of supplying water to land or crops to help growth either by wells, bores or surface water is known as Irrigation. The practice of agriculture with the help of rainwater is known as Rain-fed Farming and when water is supplied through various sources then it is termed as Irrigated Agriculture. Irrigation is essentially the non-natural way of providing water to compensate the inadequacies for increased agricultural production.

Globally Irrigated agriculture contributes to 40 % of the total food produced and represents 20%[5] of the total cultivated land. It is also said to be twice as much productive per unit of land as rain fed agriculture,

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[1] *https://impoff.com/importance-of-agriculture/*

[2] *https://www.worldbank.org/en/topic/agriculture/overview#1*

[3] *http://mospi.nic.in/sites/default/files/press_release/Presss%20note%20for%20first%20advance%20estimates%202018-19.pdf*

[4] *World Development Indicators http://data.worldbank.org/indicator/er.h2o.fwag.zs*

[5] *https://www.worldbank.org/en/topic/water-in-agriculture*

hence leading to intensified production and diversified cropping. In India, currently about 51% of agricultural crops are cultivated by various irrigational sources[6].

Fig: Irrigation Facilities to a Field

When it comes to State of Telangana the figures vary drastically. As per CESS, only 63% of the farmlands are rain fed and that major source of water for Irrigation facility is through Tube wells. This is one among the challenges faced by the state along with erratic distribution of rainfall and exposure to hostile climatic conditions etc. with respect to Agriculture. In fact the State Government has declared 153 mandal's out of total 584 as drought affected. As per the official data[7] 139 mandal's received excess rainfall, 292 mandal's received normal rainfall and remaining 153 had deficit rainfall. In order to overcome these challenges the State Government has been making numerous efforts with major, medium and minor irrigation projects.

1.2 Lift Irrigation:

Lift irrigation becomes essential in those areas where the fields are at a higher altitude and the water sources are at lower altitudes. It is a method were water from tanks, wells, canals is being lifted with pumps and supplied for cultivation.

[6] *https://en.wikipedia.org/wiki/Irrigation_in_India*

[7] *https://www.thehansindia.com/posts/index/Telangana/2017-10-26/153-mandals-to-be-declared-drought-hit-in-Telangana/335328?infinitescroll=1*

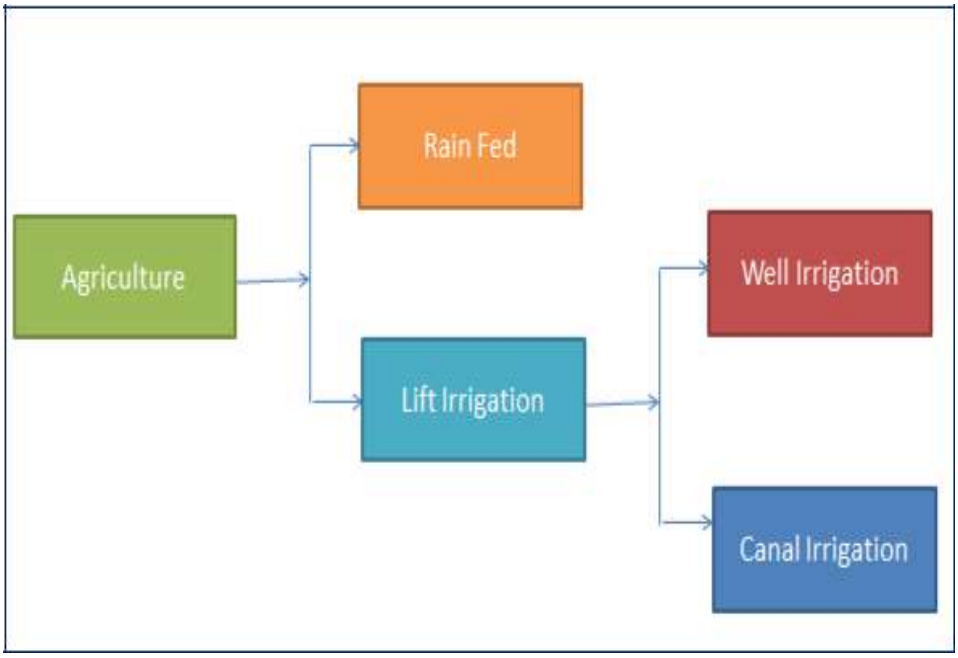

Fig: Types of Irrigation

Lift Irrigation has two main tasks. First is to carry water by the means of pumps from low lying water source to main delivery chamber. Second the water from the delivery chamber needs to be distributed to the fields of the farmers by means of suitable and proper distribution system[8].

For a viable lift irrigation project, it is important to have a constant water source for the whole irrigation season and feasibility to lift water to the desired location.

1.3 Importance of Lift Irrigation:

In the next 35 to 45 years world food production should be doubled to meet the demands of increasing population. Ninety percent of this increased food production will have to come from existing lands & seventy percent of this increased food production will have to come from irrigated land. Without irrigation farming is very limited & if the rainfall decreases to less than 30cm, agriculture becomes impossible without irrigation. It increases crop yield and protects from famine. It helps to cultivate superior crops with the water supply as per need of the crops and improves the quality of the harvest.

[8] *https://www.icid.org/res_irri_lift.html*

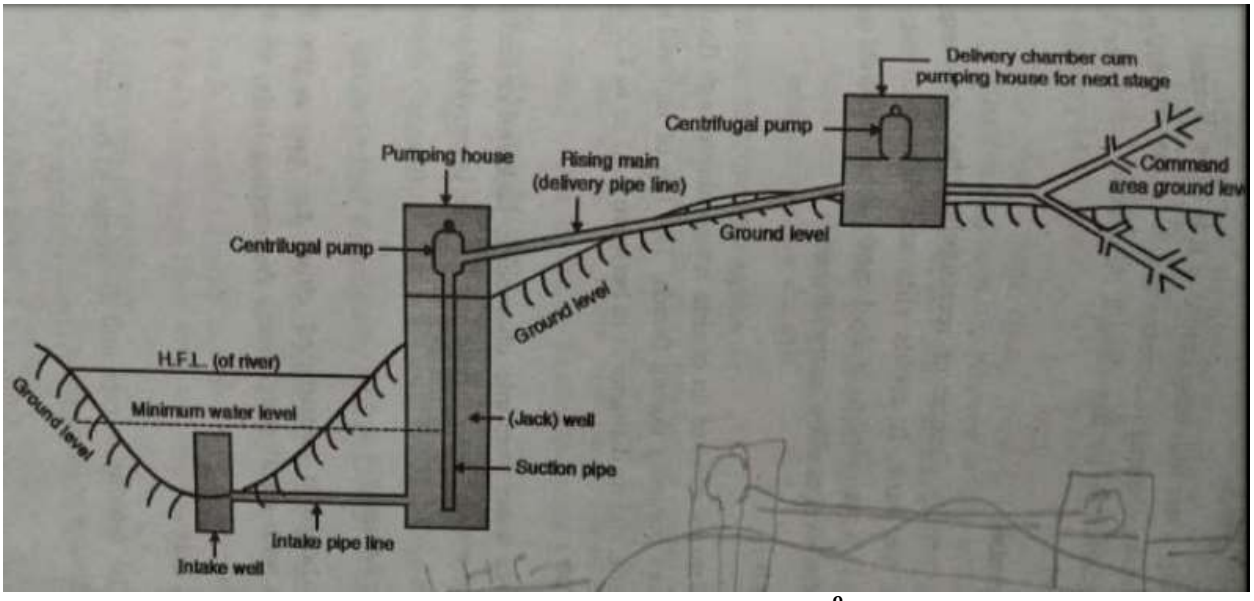

Fig: Layout of a Lift Irrigation system[9]

1.4 Benefits of Lift Irrigation:

Lift Irrigation has many benefits. To begin with, it makes cultivation possible in high line areas. In this type of Irrigation there is an optimum use of water which in increases its efficiency. It prevents water clogging as water is pumped out using motors which also reduces manual labor. More people get benefit since it is an inclusive means of development and lifting water from storage place to fields would be less expensive than from far away canal.

Lift Irrigation projects also creates many socio-economic and environmental benefits. Irrigation water improves water conditions in the soil, increases the water content of plant fibers, dissolves nutrients & makes them available to plants. Irrigation affects temperature conditions by regulating the temperature of the surface layer of the soil & the ground layer of the air & also makes possible control of the growth & development of plants & improvement of the quality of the harvest. Provision of irrigation facilities will bring significant changes at various levels which include change in production patterns, land and property values and overall economic activities through backward and forward linkages.

9 *https://www.slideshare.net/gayatrisherkar/minor-and-micro-irrigation*

Chapter II

Demographic Details:

The Project was executed in Peddagudem Village of Wanaparthy Mandal. Wanaparthy is a district located in the Southern part of Telangana. It was carved out of Mahabubnagar district. The district is spread over an area of 2152 square kilometers and according to the 2011 Census of India, the district has a population of 5, 77,758. The district comprises of one revenue division at Wanaparthy and 14 mandals.

Fig: Wanaparthy District in Telangana

Fig: Wanaparthy District Map

Fig: Satellite Picture of Peddagudem

Peddagudem is a village in Wanaparthy mandal. It is situated at 16.3208° N Longitude and 77.9896° E Latitude. It is surrounded by Kistagiri, Rayanpet, Sankireddypalli, Rajapet, villages within 3-5kms. %. In Peddagudem maximum part of rain fall occur in the months of September and October. The average rain fall varies from 750 mm to 800 mm and distribution of rain fall is erratic. The temperature of the area varies from 35 deg. to 40 degrees in the month of May. The months of May & December are the hottest and coldest respectively. According to various government reports and documents the following demographic details of Peddagudem have been extracted.

2.1 Village Statistics:

Area of Village	**2,631 Hectares**
Total Number of Households	1088
Total Population	5210
Population Density	4.7
Children between 0-6 yrs	12.7%
SC Population	10.4%
ST Population	18%
Literacy Rate	46%
Total Workers	54%

Fig: Demographic Details of Peddagudem

2.2 Current Conditions- Agriculture & Cropping Details

Agriculture and its allied activities is the primary occupation in Peddagudem village of Wanaparthy village. According to Part A of Census 2011 Peddagudem village has a Net Sown Area of 108 hectares of which the total irrigated land is 62 Hectares. Of the area irrigated, 24 hectares is irrigated from wells/tube wells and 38 hectares by Tanks/Lakes. Out of total population in village, 94.24 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 5.76 % were involved in Marginal activity providing livelihood for less than 6 months. Of workers engaged in Main Work, 727 were cultivators (owner or co-owner) while 1563 were Agricultural laborers. The main crops grown are Paddy, Groundnut, Jowar, Maize, Red gram, Castor, Cotton and Chilies.

CHAPTER III

LIFT IRRIGATION PROJECT AT PEDDAGUDEM

Telangana, youngest of the Indian states has declared drought in most of its districts, one among those was Wanaparthy. In order to overcome the crisis the state government has initiated different programs such as Mission Kakatiya, Mission Bhagiratha, Haritha Haram, etc. Several initiatives have been introduced such as managing natural resources, tanks restoration, rain water harvesting and various irrigation projects.

As a part of these initiatives a minor irrigation project was executed at Khan Cheruvu of Peddagudem village of Wanaparthy Mandal. The Khan Cheruvu project is one among the 40 minor lifts as committed by the State Government for Wanaparthy with an aim to cover the gap in ayacut and to irrigate every acre of cultivable land in the district. The project would draw water from the 8^{th} distributary of Mahatma Gandhi Kalwakurthy Lift Irrigation Scheme.

Fig: Peddagudem Canal – Source water for lifting

3.1 Scope:

The project is expected to cover the scope to:

1. Provide irrigation to 3,000 acres land in drought prone Peddagudem and its surrounding villages in Wanaparthy Mandal.
2. Support 1250 farmers and reach out to 1000 more farmers who cultivate water intensive crops.
3. Fill the chain ponds back from Khan Cheruvu to Bodunukunta, Kotha Cheruvu, Godonu Cheruvu present in Peddagudem village

Fig: Connected water flow to the smaller water bodies

3.2 Objectives:

The objectives of providing Khan Cheruvu Lift Irrigation project is as follows:

1. To facilitate irrigation to drought affected fields in and around Peddagudem village.
2. To Provide Crop Insurance against drought.
3. To increase the ground water levels in the areas surrounding the Khan Cheruvu
4. To ensure farming activities goes on throughout the cultivation seasons.
5. To provide irrigation to water intensive crops which are predominant crops in the villages.
6. To reduce the investment put in by farmers for procuring water to fields.

3.3 Project Technical Details:

Pump House Location	Bodonakunta
Height of the Pump House	17 feet
No. of Pumps	8 (Texmo)
Height of the Pump	35 feet
Capacity of Each Pump	15 Hp - 4 stage
Discharge of each pump	2900RPM for 1 mint 750 Lts.
Total power required	One motor 25 KV * 8 = 200 KV
Motor operation timings and hours	24 hours
Length of the tunnel	2.900Km
Khan Cheruvu Location	Peddagudem Village
Capacity of Khan Cheruvu in TMC	0.3 TMC- 250 Acers

Fig: Pump House at the Site

CHAPTER IV

PROJECT EXECUTION:

The Lift Irrigation Project was initiated by the Honorable Minster of Agriculture for the Telangana State **Sri. S. Niranjan Reddy**. Upon his request, **Corteva Agriscience**, a major Chemical and Seeds Company has come forward to fund this project as a part of their Corporate Social Responsibility. After a thorough scrutiny for an implementing partner, Corteva Agriscience selected **Ramky Foundation**, which met all their required criteria.

Upon receiving the project **RF** Team visited Peddagudem village to understand the ground level challenges and prevailing agrarian crises of the farmers in that village. A Team of Social and Technical experts interacted with the concerned stakeholders such as Sarpanch, Farmers and Agriculture Laborers. After establishing the ground realities the project scope and outcome have been improvised to accommodate the actual needs. A team of Engineers have finalized the schematic diagrams in consultation with **Corteva Agriscience** and commenced the construction. The Honorable Minister graced the Bhoomi Puja occasion and started the work by operating JCB at the site.

Fig: Bhoomi Puja and commence of construction activities by the Honorable Minister Sri. S. Niranjan Reddy

In spite of numerous challenges such as pandemic crises, labour unavailability and field related technical issues, **Ramky Foundation**, with the help of **REEL**, was able to successfully achieve the timelines. Instances like blasting the stones to continue the pipeline to Khan Cheruvu incurred unexpected additional cost to the project. The project was completed phase wise as per the plan. In the first phase of the project, all the work related to making pathway for laying the pipes was completed. Pathway was made with the help of JCB under the supervision of Technical Experts and pipelines were installed.

Fig: Earth work and pipeline work in progress.

In order to ensure free flow of water and avoid air blockages, Air valves were installed at the right locations. The representatives from **Corteva** visited the site for regular inspections.

Fig: Site Inspection by Corteva Representative

Fig: Air valves installed in the fields

After the completion of pipeline work the last phase of the project was initiated. Transformers for the power supply and the Pump house were set up at the required locations.

Fig: Construction of Pump House

Fig: Construction of Transformer

The entire project stretches along a length of 3 KM, which nearly covers an area of around 3000 acres. Thus, **Ramky Foundation**, in association with **Corteva Agriscience** and **REEL**, successfully completed the project within 41 days instead the 90 days of stipulated time in order to ensure water facility right in time for agriculture.

Fig: Inauguration of the Pump House

Fig: Inauguration at the Khan Cheruvu

Fig: Water level on the day of Inauguration

Fig: Increase in water level on the day of evaluation

CHAPTER V

EVALUATION & FIELD VISIT

After the successful completion of the project **Ramky Foundation** had sent a Team of Evaluators to see the results and interact with the farmers to capture their experience and expectations. A team of three evaluators visited the site to evaluate the project. The team with the help of local volunteer Yaadiah, team interacted with Technical Team, Farmers, Agriculture Labors and Sarpanch. As per the discussion it was understood that the village faced an acute shortage of Irrigation sources and have been predominately dependent on rain fed farming. The lack of rains for the last 10 years had worsened the situations of the farmers.

Attempts were made to overcome these crises by constructing water canal structures in 2009-10 passing through Peddagudem, Kadikuntla, Mentapalli, Nasanalli villages, but then it was in vain as the water sources were not connected to the canal. It was only in the year 2015-16 when the water from Jurala Dam to Sanakar Samudram Reservoir was lifted into the Canal, did the villagers find hope. But this hope was short lived as the canal water was only able to provide water to only one of the 4 ponds in the village. Thus only a small portion of the farmers were benefitted by the canal.

Fig: Khan Cheruvu Lift Irrigation Source points

It was the vision of the State Agriculture Minister **Sri. S. Niranjan Reddy** that brought in hope to the lives of farmers in Peddagudem. The honorable minister has envisioned providing irrigation source to the village in order to cultivate the entire village's cultivatable land. Thus with the help of **Corteva Agriscience**, **Ramky Foundation** and **REEL**, the foundation stones were laid and within a very short time the project was completed ensuring the irrigation sources availability right at the beginning of crop season.

Fig: Completed Project at Khan Cheruvu

The Project was designed in a very strategic manner. The project ensured that lifting and pumping water into the Khan Cheruvu would fill the other water bodies present in the Pedagudem village. Once the Khan Cheruvu reaches its maximum capacity the water would flow back into the Bodonu kunta, Kotha Cheruvu and Gondem Cheruvu. This has ensured that all the field surrounding these water bodies are sufficiently provided with irrigation sources.

Khan Cheruvu Site:

The Team after inspecting the source point visited the Khan Cheruvu, the place where the water is being lifted to and pumped in at. The Khan Cheruvu is spread across 250 Acers and has a capacity of 0.3 TMC.

Fig: Brim Point of Khan Cheruvu where water flows back to the local water bodies

As per the farmers who have their fields in around the Khan Chervuvu this project was boon at the right time. They have been facing agrarian crisis due to lack of irrigation sources. They were forced to look for alternate livelihood even in crop seasons. Some of the farmers who could afford used pipelines and motors from canal for their field, it was a huge financial burden on them. There were also few farmers who had bore wells in their respective fields but due to decreasing ground water, there was acute water storage. With severe ground water shortage and lack of surface water availability, most of the farmers has very less annual income and were forced to move into alternate livelihoods. According to the farmers, with the availability of water they can afford to go to full-fledged farming. The farmers are also confident that the recent rains and water in the khan cheruvu has increased the ground water levels and few farmers would be using their bore wells rather than completely depending on surface water.

Fig: Panaroma view of the Khan Cheruvu & Field surrounding it

After visiting the Khan Cheruvu, the team visited fields which are near Bodunukunta and Kotha Cheruvu. The farmers at these places are also happy that they can now start cultivating paddy. As per them per acre the farmers use to have a profit margin of thirty thousand rupees which was not possible when they cultivate other crops. The farmers usually install motors to pump the water from these local water bodies.


Fig: Interaction with the Farmers at their fields

The team also interacted with the agriculture labourers. According to them due to provision of irrigation sources and good rainfall this season they would be finding employment for the whole cultivation season. They do not have to travel to look for some other means of livelihood. They expressed their gratitude for the Minister and the organizations which have made their dreams come true.


Fig: Interaction with the Agriculture Laborers

CHAPTER VI

TESTIMONIES:

6.1 Interaction with the Farmers:

I'm the wife of Dhana Satyam and I belong to Peddagudem Village. I am very happy that Niranjan sir has laid pipes which filled our cheruvu. Now we have nicely ploughed our fields with JCB and started cultivation. Because of this, we get to live happily in our village and cultivate our lands rather than going to other villages in search of a job. Just a few weeks before this project, we had to sell our oxen for Rs.30000/- to buy pipes for pumping water all the way from the canal to our fields. Now that water is available in Cheruvu near our fields we have an ample amount of water here itself and we don't have to get water far off from the canal. Now water is so abundant that wherever we look we find water around in the fields. If the water availability continues to be so abundant we are confident that our bores will not dry out and we can even start farming in dry lands of our village itself. As of now, there seems to be no shortage of water and we are happily living.

My name is Peddagudem Sathanna and I have 4 acres of land behind Khan Cheruvu. Due to lack of water, I had to cultivate groundnuts earlier but it was a complete loss. But then recently, **Niranjan Reddy sir**, **Ramky** & **Corteva** Company had helped in laying pipes in our village for pumping water from the canal to the Khan Cheruvu, which has provided us with agriculture waters. Earlier four wells were dug to cultivate 2 acres but the water from those wells was hardly meeting the requirements. Finally, as a last resort, I opted for bore well by taking a debt of one lakh rupees, but that also was in vain as the water was not sufficient for even an acre. While cultivating groundnut I have incurred huge debts of which I am yet to pay back half. The availability of water had changed the scenario. I have now started paddy cultivation in 3 acres of land and clearing the rest of the land for more cultivation. With abundant water available at hand I am expecting a good yield and hope to pay off my debts. This time my family and I do not have to go out for work. We all can stay together in my village, make our income and live happily.

6.2 Interaction with Agriculture Laborers:

We used to go to other villages in search of livelihood due to lack of jobs. Water scarcity was so bad that farmers use to hardly cultivate half an acre. We were not even able to get fodder to our livestock because of which were forced to sell them. But now the situations have changed as pipes were laid ensuring water availability to fields. We no more have to step out of the village and now with COVID around we can safely stay and earn in our own village. Will put our efforts in our village itself if the water continues to be available like this and we would be able to buy back our livestock if the yields are good. In fact, we can stop leasing tractor and use our own livestock for farming as now we would be able to get fodder for them. There is also an increase in our daily wages, women who use to get Rs.150/- to 200/- per day earlier are now earning around Rs.750/- to 850/- and men from Rs.250/- to 350/- are earning Rs.900/- to 1000/- . We are also able to repay our debts, manage without taking any new debts and live happily with our children. Please thank all those who laid these pipelines on our behalf as we are very happy with it.

We are living happily since the time pipelines have been laid. Earlier most of the fields were filled with weeds due to lack of water. There was a time where each member of the family had to go in different directions in search of jobs and mothers hardly get a chance to see their children. While people with some source of income survived the rest were gone to the wind. Since the pipelines were laid, water bodies are full of water supplying ample amount of water to fields. All the farmers have got their fields cleaned by uprooting the waste plants and making them ready for cultivation. All the agriculture laborers are having a hand full of work as the fields are getting ready for the plantation. A Village develops only when the farmers in that villages are well and when farmers flourish, agriculture labors like us would automatically be well looked after. Since water is getting distributed well across all water bodies in the village, all the fields are now fertile.

I belong to Peddagudem, my name is Shanthamma. Due to drought conditions, water scarcity and lack of work in my village, I hardly earned an income Rs.150/- to 200/- per day. It was barely meeting my needs hence was forced to move to Hyderabad to survive. But, survival became a challenge in Hyderabad as well due to corona and hence I was forced to move back to the village. But the scenario in my village had changed. Since the time **Ramky** and **Corteva** company people laid pipelines, agriculture jobs seem to be increasing within my village. I am now able to get work every day, with a daily wage of 750/- to 850/-, live happily and safely with my family.

6.3 Interaction with the Sarpanch:

My name is Kondayya. I'm the Sarpanch of Peddagudem village. Before the water facility was provided to canal, migration was at peaks among the people of this village. Due to migration many people left the village leaving behind their old parents. These old people used to feel very sad and were facing lot of troubles for staying away from their children, but then they were helpless. Even when water started following through the canal, the fields surrounding it had water facility which was beneficial for only few, whereas the rest of the fields i.e. approximately more than 2000 acres did not have any irrigation sources. Thanks to the Minister Sir who fulfilled his promised of getting water facility to Khan Cheruvu and with the help of **Ramky Group** & **Corteva Agriscience** we are now able to cultivate every possible field in our village.

CONCLUSIONS

Agriculture water is the most vital component in many aspects. Surface Irrigation has multiple primary, secondary and direct impacts. Primary impacts of Irrigation could be increased crop productivity, expansion in crop areas, increased crop intensity and increased crop diversification. Secondary impacts would include more number of jobs in agriculture, increased employment in agriculture related activities, increased food security, lower food prices, increased ground water recharges and decreased cost of water uses.

Fig: Fields surrounding Khan Cheruvu

After the secondary data analysis, field visits and interaction with the farmers it can be concluded that the Peddagudem Lift Irrigation project is a boon the farmers of the village. The project seems to have begun at the right time and added to it was the abundant rainfall. As expected the project would be able to solve the water crises and will be most optimally used by the farmers. It is also expected to increase the yield, cut down the expenses of the farmers and provide multiple agriculture related jobs.