

DIALOGUE

**ESTABLISHING ON CENTRALIZED
AGRO FUEL PROCESSES AND
MOVING TOWARDS COMMUNITY
BASED ENERGY MANAGEMENT**

**THIS IS A BASELINE STUDY THAT WAS TAKEN UP IN
THREE UN-ELECTRIFIED VILLAGES ANDHRA
PRADESH IN CONTEXT OF ESTABLISHING
DIALOGUE ON CENTRALIZED AGRO FUEL
PROCESSES AND MOVING TOWARDS COMMUNITY
BASED ENERGY MANAGEMENT**

Baseline Study

2015

NARRATIVE

BY:

ECONET



ESTABLISHING ON CENTRALIZED AGRO FUEL PROCESSES AND MOVING TOWARDS COMMUNITY BASED ENERGY MANAGEMENT

A BASELINE STUDY- 2015



NARRATIVE BY
ECONET AND KOVEL FOUNDATION

ECONET, Pune.

ECONET is a Development Support Organisation working towards Human and Institutional Development and believes in identifying, nurturing and strengthening local leadership among communities. We are working primarily with Adivasi and Nomadic Tribes in Maharashtra, with engagements in other States.



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A. BACKGROUND OF THE STUDY

As a pilot to this project, similar baseline studies and intervention plans were prepared and implemented in Nashik and Uttar Pradesh. Based on the success of the outcomes and with a vision to replicate this Programme, 3 villages that are heavily dependent on surrounding forests to fulfill their energy requirements have been selected in Andhra Pradesh for the current project- ESTABLISHING DIALOGUE ON CENTRALIZED AGRO FUEL PROCESSES AND MOVING TOWARDS COMMUNITY BASED ENERGY MANAGEMENT.

Through this baseline study, we aim to collect information to expand our knowledge regarding local rural energy requirements (mainly for cooking, heating and lighting). Based on this enriched understanding, current gaps existing in the energy requirements as well as intervention strategies for plugging these gaps will be drawn, basis 4 focus areas

1. Studies and Documentation
2. Exchange and Education
3. Government Engagement
4. Community Programmes

Data has been collected using various tools such as survey formats, group discussions with the community, field visits to project location and experience sharing sessions with representatives of the community.

The Baseline study presented here is the first hand account of the status of the 3 villages before the intervention under the project. The idea of selecting village communities heavily dependent on surrounding natural resources is to be able to get all variable and measures where the bioenergy is used and its contrasting uses within the community. This will further help us in the study to understand the alternate standing need of the agrarian forest dwelling Tribal communities.

B. REGION DESCRIPTION

The study was conducted in 3 villages- Koraparthi, Pinakota and Valasi in Ananthagiri Mandal in Visakhapatnam District. These villages are mainly inhabited by Konda Dora, Nooka Dora, Valmiki, Gadaba, Khond tribes. Life of these tribals is woven around forests, be it the food they eat in the form of leaves, fruits & nuts, fibers and tubers or the beverages they drink or the medicines they use to cure ailments or the houses they live in or the fuel wood they use or the fodder for their animals. While every aspect of contribution of the forests is in itself important, the most vital of them is that it provides the tribals with food security for almost the entire year in some form or the other. The habitations of such tribal groups are generally scattered in nature.

Tribals who are living within the forest in the studied area are marked by low literacy level of men and women. They are living in the vicious circles of poverty, which push them into one of the helpless situation and further marginalization of their lives. In such a situation the women and the children suffer the most.

They are majorly dependent on agriculture, collection & marketing of NTFP, daily wage, etc. for their livelihood. The major agricultural crops are paddy, millets and pulses. They inhabit in remote and deep forests and poorest of the poor families solely dependent on collection and

marketing of NTFPs namely gums, oil seeds, nuts, seeds, roots, bark, etc. Men and women are involved in harvesting, processing and marketing of NTFPs.

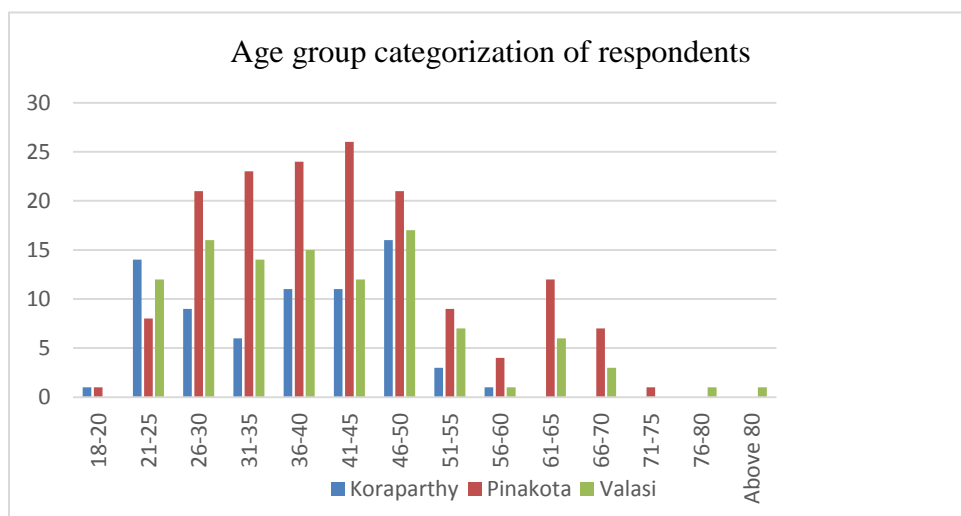
C. VILLAGE PROFILING

Village Name	No of household
Koraparthly	72
Pinakota	155
Valasi	105

Valasi and Pinakota are gram panchayat headquarters, whereas Koraparthly is a revenue village attached to Pinakota Gram Panchayat. As the number of households in each habitation is quite low (15 on an average), every Gram Panchayat consists of an average

of a cluster of 15 habitations. Since the villages being surveyed, fall either under a Gram Panchayat or the category of a bigger village, the size of each village was comparatively high. Since the number of villages for the study are only 3, the study team felt that there must be considerable number of households in the sample villages so as to ensure the opinion of larger groups. This forms the basis for selecting the bigger villages among the rest.

Of the total of 332 respondents, a total of 110 respondents are above the age of 45, which accounts to 33% of the total respondents. This is a very important component for the study as it ensures enough information and suggestions from the elderly who have been witness to the changing trends of the community on the dependency on various bio-fuel sources over a period



of 2 generations. At the same time, the age groups below 45 particularly youth have added value in terms of their readiness in adopting new and innovative ideas when discussing energy security and management plans.

Graph 1: Respondents' age group

The total population in all the 3 sample villages is 1241. The male population (including boy children) in the total population of the 3 villages is 51% and female population (including girl children) is 49%. Surprisingly, when we look at the ratio of girl to boy in children, the ratio of male and female in total population is reflecting exactly i.e. 51% boy children and 49% girl children. This could be an indicator of maintaining good gender balance. Even though the issues of gender discrimination cannot be neglected in any part of the country / world, with Kovel's long and decades of experience while closely associating with tribal communities in the State

and in the District, it is observed that the gender discrimination is not as much as in the rural or urban communities. It is also observed that the boys and girls both are being sent to school.

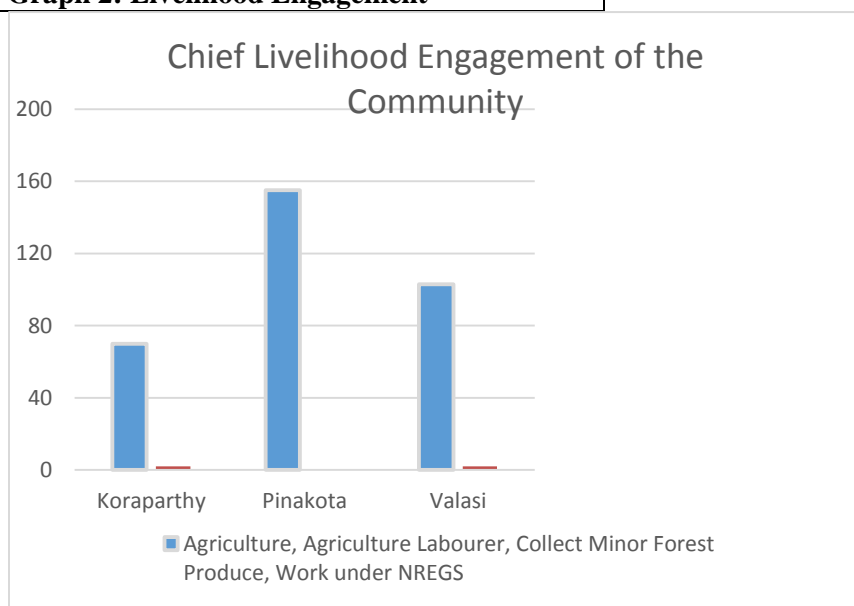
Village	Total Population	Male members	Female members	Children Boys		Children Girls	
				0-6 years	7-18 years	0-6 years	7-18 years
Koraparthly	264	121	109	1	16	4	13
Pinakota	581	288	284	1	4	1	3
Valasi	396	181	180	1	17	1	16

Apart from all the above, incidentally only one boy child between the age group of 0 to 6 years is present in each village while the girl children are 2 in each village on an average. When the surprised study team raised the same during the next visit/s to the study village, there seemed to be no specific reason or motive as far as the finding in this area is concerned.

Livelihoods

In the general scenario of tribal communities in this area, agriculture plays the key role in livelihood as each household has at least a certain extent of land, either titled land or shifting cultivation patch category, with some exceptional cases. Prior implementation of MGNREGS, NTFP collection/sales used to play either secondary or tertiary livelihood for most of the families and were a primary livelihood for few. During this time, wage labor played as a supplementary income source along with the other 2 occupation sources mentioned.

Graph 2: Livelihood Engagement



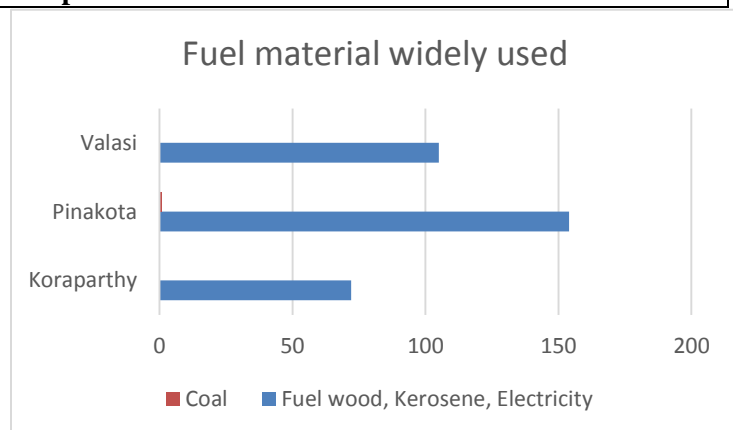
Coming to our present context, the livelihood scenario in the tribal areas has been shifted from agriculture and NTFP to depending a lot more on MGNREGS. For some, this is actually the primary livelihood source. However, NTFP's play a significance role in providing livelihood for the tribes during lean season for agriculture and other livelihood sources during the year.

CURRENT ENERGY SCENARIO- IDENTIFYING GAPS

The following few segments discuss the framework of the study wherein fuel requirements and their availability for utilization have been mapped. This leads us to identifying gaps, thereby suggesting appropriate action plans.

Fuel material

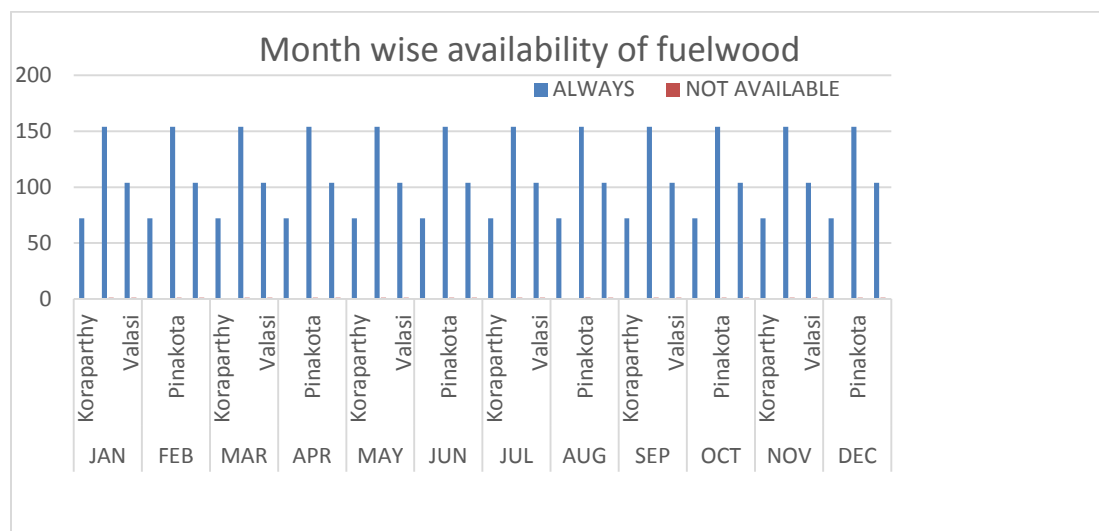
Graph 3: Fuel material used



Fuel material widely used are fuel wood from surrounding forests, kerosene and electricity with a very rare usage of coal. In all the 3 villages, fuel wood, kerosene and electricity are being used together to fulfill needs such as cooking, heating and lighting. Whereas in Pinakota, there is only one family that uses coal as a main fuel source for cooking and heating. Although the graph shows us that 3

types of fuel material are common across the study areas, our observations are that fuel wood plays the key role when it comes to cooking whereas kerosene and electricity are being used as per the availability, which is mainly for lighting purpose.

Availability of fuel wood



Graph 4: Availability of Fuel Wood

The above graph shows us the situation of availability of fuel wood against the need for the same in the study area wherein, there is no problem in case of availability as the villages are surrounded by the forest and accessible within their reach. As far as the interactions and interviews while collecting the data are concerned, the study team did not find any specific measures or management practices being followed by the community for sustainable use of fuel wood or perhaps they are following some of them unknowingly which may result in some form of sustainability of resources.

Fuel type

Fuel wood

In the study area, all the households are using fuel wood round the year for cooking purpose. Since the 3 sample villages are located within the forest and there is not much problem for collection of fuel wood, all the families obviously depend on fuel wood for everyday cooking. Almost all the households have the traditional chullah's both inside and outside the house. Most of them have their traditional stoves in the open place outside the house but very few of them have thatched roofs over the traditional stove outside their house. They usually prefer to cook outside but only in certain typical situation/s such as raining or any other reasons, they cook inside the house. Use of kerosene and electricity for cooking is out of question in the study area.

Though the community did not deny using fuel wood for heating purpose especially during the period from the month of October to January, it is not under their priority list and some of them expressed they never need it. From February to September that includes summer and rainy seasons, most of the households don't need heating. In case of bathing, all the households are using mere fuel wood irrespective of the season.

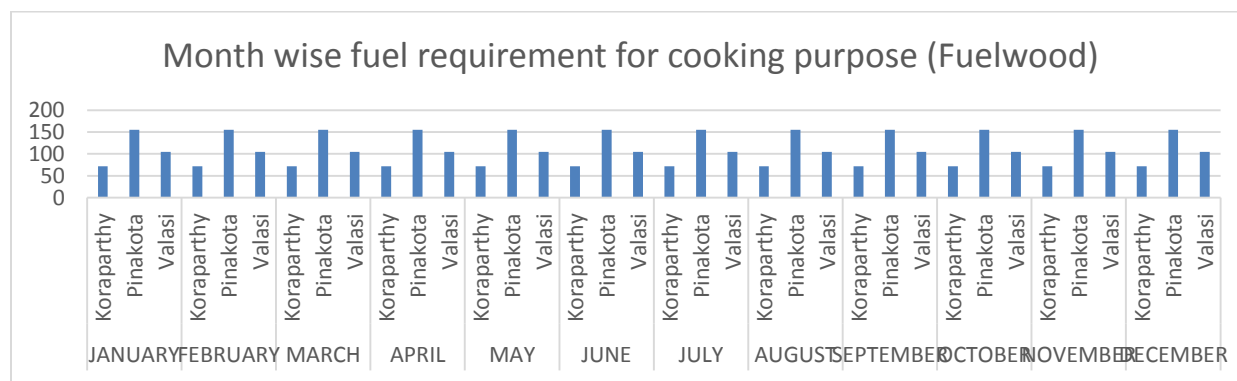
Electricity & Kerosene

Except for 2 or 3 households which are using Kerosene, all the rest of them are using electricity for lighting as almost all the houses are well electrified. Even though power fluctuations and power drop are problems in the area, they are able to manage the same with Kerosene lamps. But as it doesn't happen on regular basis, they expressed that they are using only electricity for lighting.

Fuel requirement

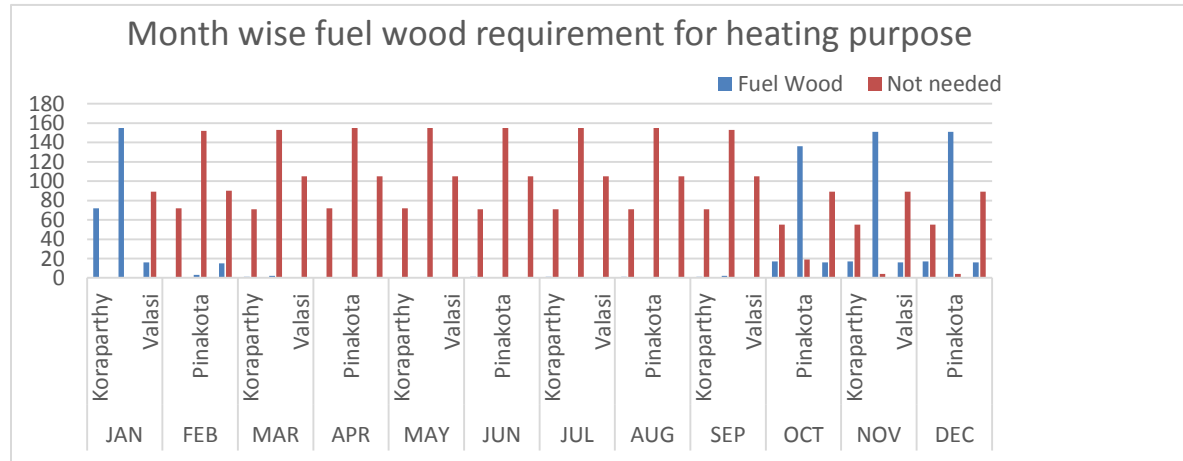
Fuel Wood

In case of cooking, as mentioned earlier, all the households in the study area are using only fuel wood in any season as the availability of the same is not an issue in the villages which are located right in the middle of the forest. Even though it was not mentioned in any of the tables, there is a low incidence of using coal for cooking/part cooking particularly inside the house when it is raining outside or non-availability of fuel wood at home. Use of coal is usually a supplement for fuel wood cooking. The following graph shows us the month wise fuel requirement for cooking (fuel wood)



Graph 5: Fuel requirement for Cooking

Across the study area, from October month to February during particularly winter and part of rainy season, around 87 households on an average require fuel wood for heating purpose and the rest of the households don't need any fuel energy for heating. If

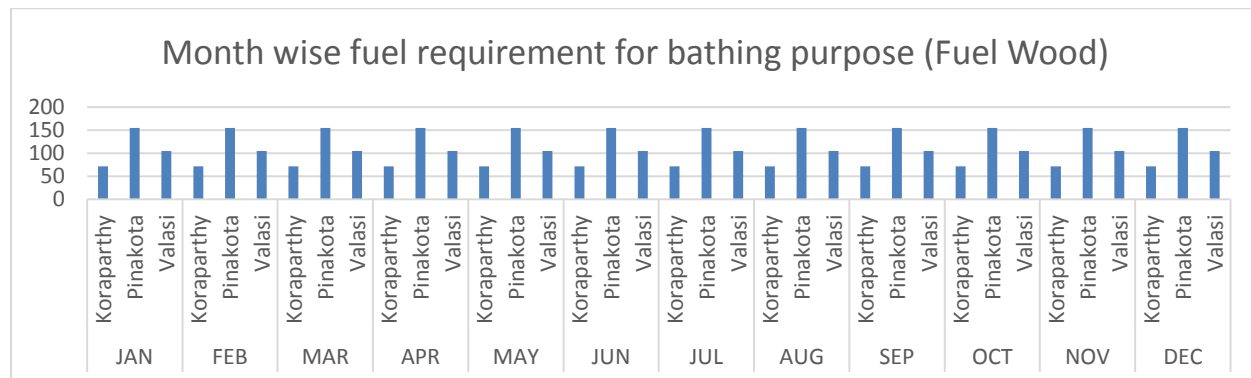


Graph 6: Fuel requirement for Heating

we talk about each village specifically,

In Koraparthly, it is only during the month of January all the households in the village use fuel wood for heating and during October to December, only 17 families on an average use fuel wood for heating. In case of Pinakota, around 148 families use fuel wood for heating and during February to September, except for 1 or 2 families, rest don't need fuel for heating. In Valasi village, from October to February, only 16 households on an average are using fuel wood for heating purpose and the rest of the period i.e. from March to September, none of the households use any fuel for heating.

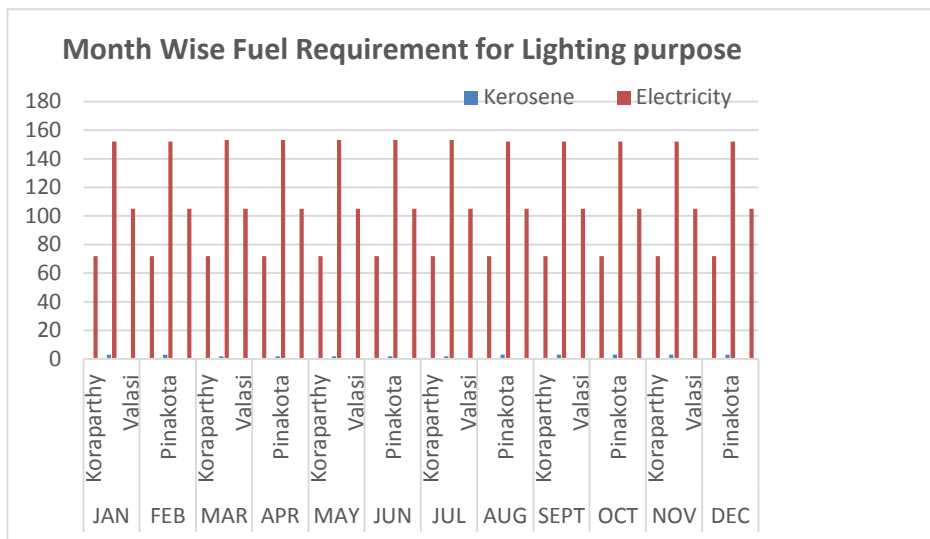
In tribal areas in general, use of hot water for bathing is very common during almost every season including summer as they say they need hot water bath so as to ease the body from the physical strain they undergo while working in the agriculture fields or forest patches located in the hilly terrains. The data from these villages also not varying from the mentioned category and all the households are using fuel wood only while heating water for bathing. The following graph shows us



Graph 7: Fuel requirement for Bathing

Electricity & Kerosene

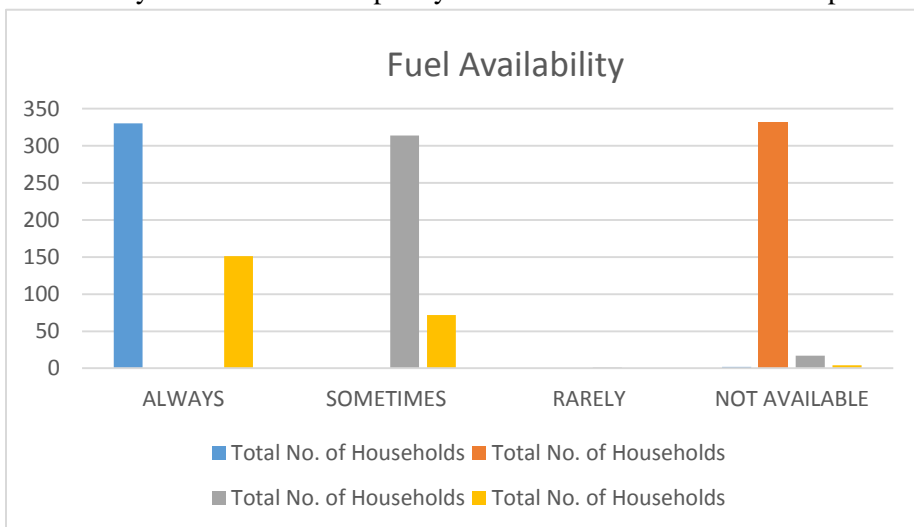
In all the 3 sample villages except 3 households (average) in Pinakota village, use of electricity for lighting is very common. In Pinakota, there are 3 families which don't have electricity connection. From August to February, 3 households use Kerosene for lighting and during March to July, only 2 families use kerosene lamp. The remaining household gets electricity support from their neighbors during the same period.



Graph 8: Fuel requirement for Lighting

Fuel availability

As discussing earlier, fuel wood is available for all the households round the year and except for casual reasons like lack of access to collect fuel wood because of rains, or anything so. Kerosene is available only sometimes for majority of the households and for the remaining households, kerosene is either unavailable or rarely available. In case of electricity, all the households at Pinakota village have always whereas in Koraparthi and Valasi, electricity is available sometimes. When we were talking about lighting, most of the respondents said electricity is the main fuel being used along with kerosene lamps. The same thing clashes here with availability of electricity. The actual reason is, there is power cut during day time in both Koraparthi and Valasi which made the respondents express that electricity is available



only sometimes but for lighting, the most used energy is electricity. For the 3 households which have not been electrified, obviously electricity is not available.

Keeping kerosene, electricity and fuel wood aside, the rest of the fuel such as cow dung cake, coal and agro-fuel oil are not at all available in the studied villages. Though use of cow dung cake in the rural Andhra Pradesh is common, in tribal areas it differs

with this situation as they have availability and access for fuel wood in their daily life.

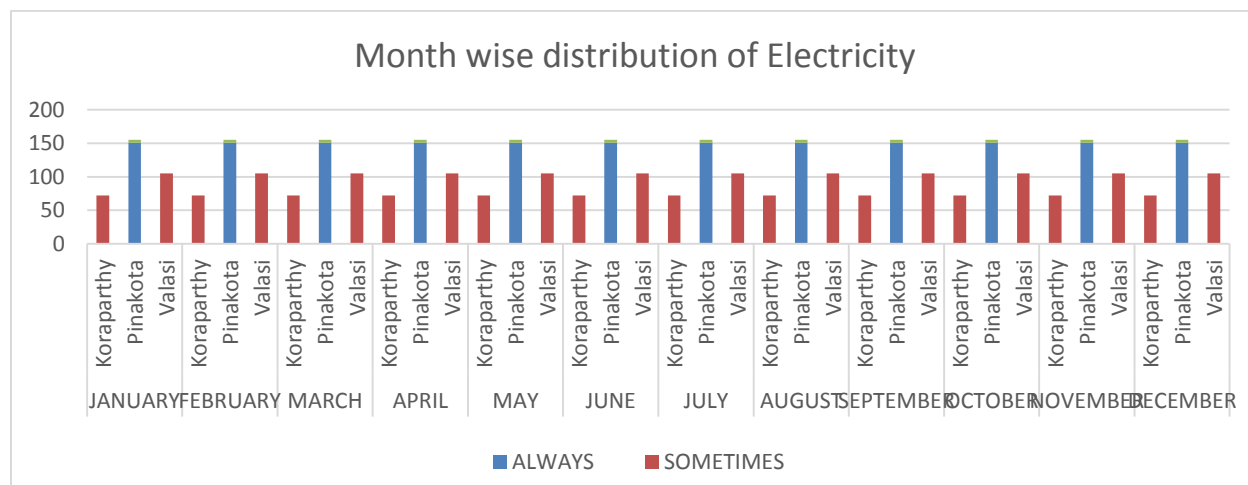
Graph 9: Fuel Availability

Non availability of fuel

Though the cow dung is available in significant quantities in the studied villages, preparation and use of cow dung cakes is not in practice and obviously, cow dung cakes are not available. It mentioned earlier while discussing about month / season wise use of different types of energy for cooking, very rarely, few of the households are in a habit of using coal particularly when cooking inside the house. Here, coal is added to the resource/s under non-available category. The reason is usually, wherever the households are using coal, it is mostly not available readily in the household/s in large quantities as they have a habit of making it available that is sufficient for a day or two while cooking with the fuel wood the earlier day/s. Finally, the agro-fuel oils completely fall under non-available category. According to the elderly respondents from the studied villages, the earlier generations had the practice of using various agro-fuel oils such as Pongamia, castor, mahua, etc. which were available in the surrounding forest area for meeting the need of lighting mostly. Due to less or non-availability of those agro-fuel oils, amount of drudgery involved in extracting the same besides increased use of electricity and kerosene, the current generations are almost not using these oils.

Month/season wise fuel availability

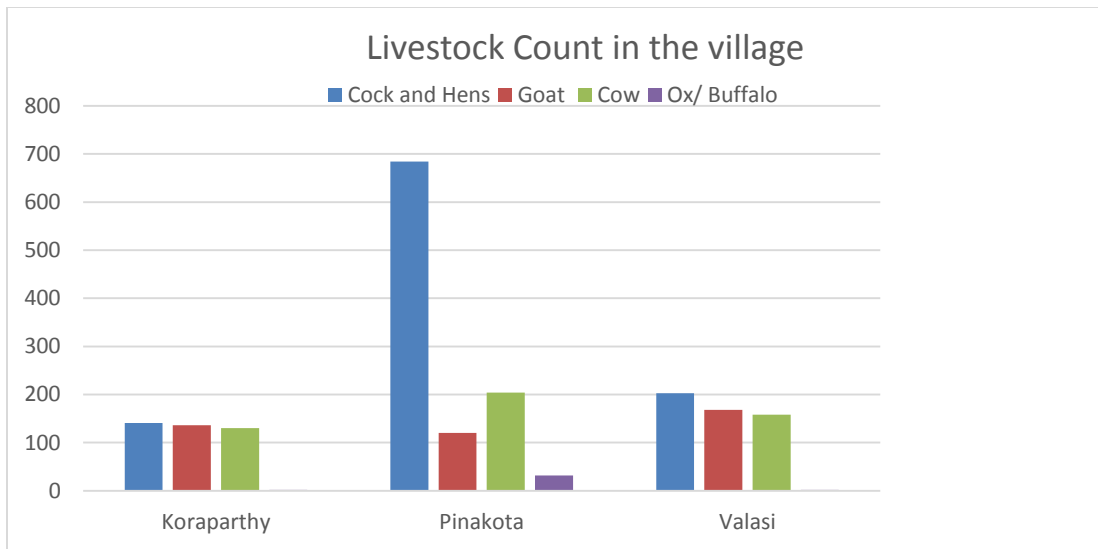
Fuel wood is available round the year for all the households except for 1 or 2 where there are no abled persons who can collect fuel wood regularly especially in case of single woman/single membered family/s. a total of 319 households out of 332 have availability of Kerosene sometimes as they have to get it only through Public Distribution System (PDS) i.e. 2 Liters per family. For rest of the households, kerosene is either not available or rarely available. With regard to electricity, in Pinakota, 152 households always have electricity and the remaining doesn't have electricity in the households. Whereas in case of the remaining 2 villages, electricity is available sometimes. The following graph reveals the month wise distribution of electricity in the study area.



Graph 10: Distribution of Electricity

Livestock

It is found that all the 3 sample villages have considerable numbers of livestock under various categories. The average figures under each category on an average are 343 hens/ cocks, 141 goats, 164 cows and 12 ox/buffaloes. The following graph shows us the glance on the livestock availability in the study area

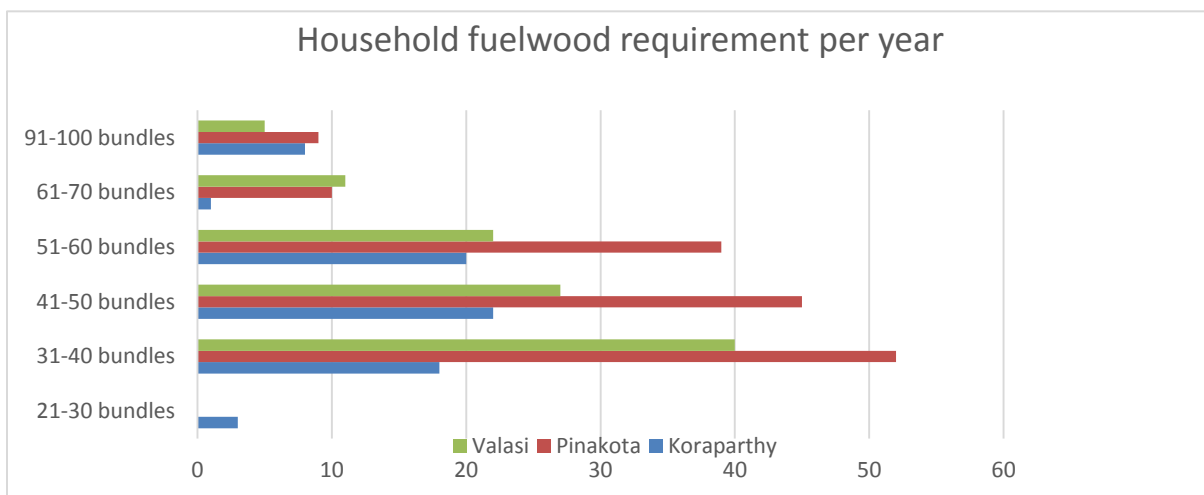


Graph 11: Livestock count

Source of lighting

The 3 studied villages have only electricity and kerosene as lighting resources but no chance for solar, wind, tidal/hydral power resources.

Fuel wood requirement



Graph 12: Household Fuel Wood requirement per year

The findings reveal that about 33% of the studied households require an average of 35 bundles of fuel wood per annum. 28% of the households requires an average of 45 bundles of fuel wood and 24% of the households require 55 bundles of fuel wood on an average. 7% of households use an average of 65 bundles and another 7% of households need 95 bundles per annum on an average. Only about 1% of the households are in need of less than 30 bundles of fuel wood. The difference among the quantity/s need by

households mostly depends upon the family size. The following graph shows the fuel wood requirement per annum

Fuel wood % harvested from forest & Purchase

About 98% of the households in the studied area harvesting fuel wood from the forest and remaining households harvest it from their backyard or from own land/s. None of the households in the study area is purchasing fuel wood in any of the month/s in the year.

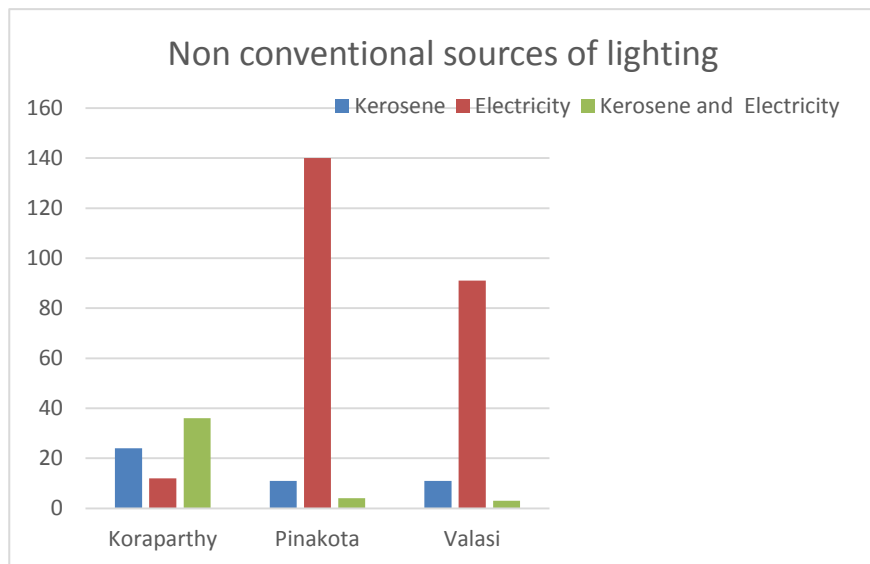
Sustaining future fuel needs

When the team tried to probe the respondents regarding their ideas and plan to sustain the future need in the context of fuel wood, almost 50% of the households have expressed that they are planning to go for fuel wood plantation either in their own lands or forest lands or even backyards.

From the remaining, about 43% of the households who have no specific thought on the sustainability, said that they will continue harvesting fuel wood from the forest. About 8% of the respondents have expressed that there is a need to use fuel wood efficiently and carefully and a 5% of them had no plans for future fuel need yet.

Preferred fuel wood species

During the discussions with the respondents and particularly elderly people in the studied villages, the species suggested/preferred for meeting future fuel wood needs are Busi/kusum, Paala chettu, Sirisina, Subabul, Girugudu, Thalamanu, etc. Only about 14% of the respondents expressed their interest to go for plantation of some or all of the mentioned species and remaining 86% of respondents have no idea on what species to plant to meet the future fuel wood needs.



Graph 13: Non-conventional sources of Lighting

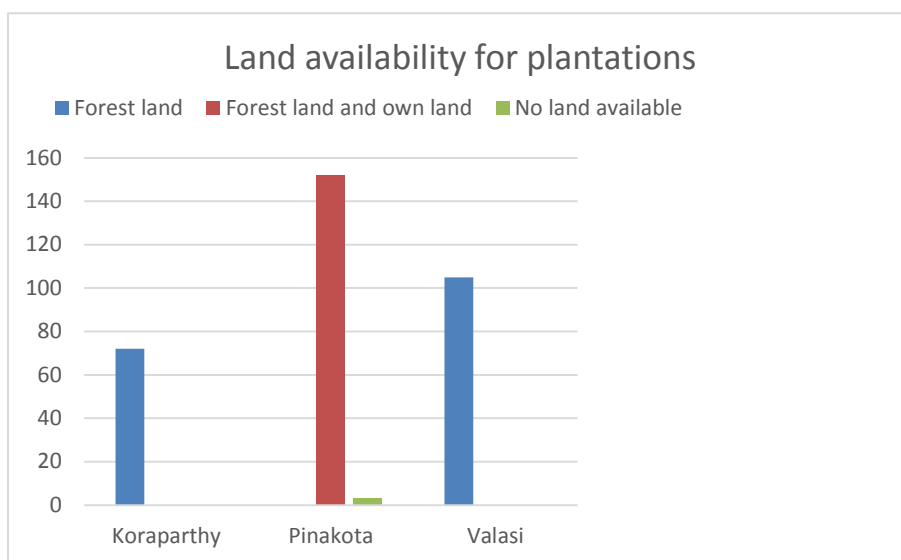
Nonconventional sources

With regard to usage of nonconventional sources of energy, it was found that the same are being used for the purpose of lighting for reading and while eating only. Out of the available and used two such sources viz electricity and kerosene, 73% of the households are using electricity, 14% are using kerosene and about 13% of the households are using both for lighting while reading and eating. The following graph shows us the use of nonconventional.

sources of energy

Land availability for plantation

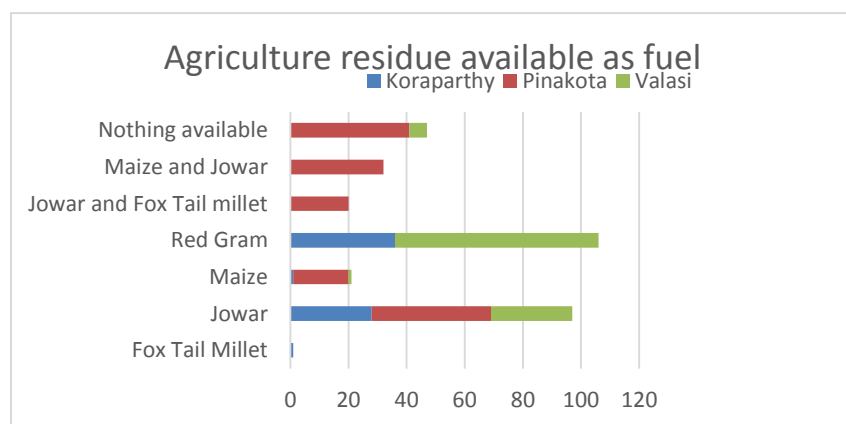
With regard to land availability for plantations, 99% of the households have come up agreeing with idea of taking up fuel wood plantations in either their own lands or both own & forest lands. Only 1% of them have no land for plantations. Out of the 3 studied villages, in Koraparthy village, all the respondents have suggested to go for plantations in only forest land, in Pinakota, 152



Graph 14: Land Availability for Plantations

households out of 155 have suggested both forest and own lands and in Valasi, all the 105 households suggested only forest land similar to Koraparthy. Among the 155 households in Pinakota, only 3 households have no land for plantation.

Agriculture residue and its use



Graph 15: Agricultural Residue available

As shown in the graph here, agriculture residue particularly from the crops categorized as millets and pulses such as jowar, foxtail millet, red gram, etc. in the study area. About 83% of the households have agricultural residue and each house has the same ranging from 1 crop to 2 crops maximum in the year.

Even though crop residue is available in the study area in

considerable quantities, none of the households is using the same as fuel in any form as perhaps they don't have problem in case of availability and access to fuel wood round the year. As far the households which have the crop residue available with them are concerned, about 65% of the households use the crop residue as bio-manure in the agriculture field itself and only one household use it as cattle fodder.

Status of Government schemes

Out of the 332 households, only 4 households are availing Government's LPG subsidy scheme and about 99% of the households are availing daily domestic provisions through Public Distribution System (PDS) which is channelized through Girijan Cooperative Corporation Ltd.

Local oil seed

Among the 332 respondents, 13% are using castor oil, 86% are using karanj oil and only 2% are using niger oil. Out of the 3 species available, karanj is mainly used for external application and lighting whereas castor oil is used for external application and the residue is used as bio-manure. Though Niger is available less and being used by very few households, it is an edible oil and has got medicinal uses.

Use of Govt. land for cultivation

A total of 46% of the respondents are using government land i.e. both revenue and forest land for cultivation. More than 14% of the households are using only revenue land for cultivation but households using only forest land for cultivation is almost nil or negligible. About 38% of the households are not using any government land for cultivation.

Ownership of agricultural land

The respondents in the study area have ownership on a total of 237 acres of land covering both revenue and forest lands. 57% of the households have title deeds for both revenue and forest lands, 39% of them have titles for only revenue land and about 4% of them have titles for only forest land.

D. Focus Group Discussions

In the above section, findings from the individual household data has been discussed in detail and apart from that the team has conducted focus group discussions in all the 3 villages wherein the elderly people, educated youth and women were involved to ensure useful information. The following inputs have come out during the discussions

- Some of the traditionally used species for fuel wood are Yelama/Thella, Thangedu, Gandra, Vengisa, etc. and the main reason for choosing them are quick heat, burning longer time, preserving of fuel wood longer time, possibility for preparing charcoal, etc.
- Among the fuel wood species, species like Maddi, Velama, Thangedu, Gandra, etc. are not available in the forest now and others are available in very less quantities now a days due to depletion and lack of regeneration efforts over a period of time- Due to non-availability of the above, the community has slowly shifted to alternative species like midatha donkalu, paladonda, jerri, juvvi, pasuru, etc. for cooking which, they cannot prepare charcoal from
- Less than 5% of the households in the study area are using charcoal as a supplement while cooking the main part with fuel wood
- Use of weed is likely meant for heating purpose during winter
- Pongam oil is used for lighting and body massaging purpose besides using as hair oil too
- Castor as a bio oil variety is available in the village and is mostly from the planted source
- Castor has 2 varieties viz small and big among which the big one is mostly planted source

- Crop residue is mostly used as an input to the soil by burning it in the field itself besides using as fodder- Valasi.
- The farmers in the study villages are adopting SRI Method in paddy cultivation (traditional and improved variety) recently and experiencing the difference in terms of yield and cost. Regarding millets and pulses, they have the practice of mixing at least two crops in the fields particularly in shifting cultivation patches.
- PDS rationing is functioning well in the area through which, the tribals are getting minimum daily provisions. In case of kerosene supply, the quantity is less i.e. only 2 liters which is sometimes not sufficient. (most of the women revealed that they use kerosene to quick start the cooking with fuel wood)-

Pongam oil extraction process

- Sun dry the seed for a day
- Crush the seed using a wooden tool
- Steam-heat the crushed stuff using a mud vessel
- Fill the stuff in 4 or 5 baskets made of Palmyra slivers
- Place the baskets one by one and put a weight of about 50 Kgs (usually a wooden piece) on the top of the baskets
- The oil that gets dropped from the lower basket is pooled in a vessel

Castor oil extraction process

- Removing the outer coat of the seeds
- Crush the seeds
- Mix with water and heat the same using charcoal
- This allows the oil to get formed as the top layer
- Then the oil is collected delicately using feather of chicken

Edible bio-oils

- Niger, castor, gingili, mahua are the known edible oils in the area among which, Mahua oil is not being used now
- Oil mill/s are available at the nearby town i.e. S.Kota that is 50 Kms away from the village and 50% of the villagers opt for going to oil mill for oil
- Rs 10 to Rs 12 per Kg of oil is charged at the oil mill towards extraction charges

E. Recommendations

- Identifying/exploring/undertaking research on existing traditional stoves for improved designs for its efficiency improvement.
- Promotion of smokeless chullahs so as to reduce pressure on forest, reduction in consumption of fuel wood.
- Initiation of Bio-gas units in each sample village keeping the livestock availability in view as the livestock in general and cattle and goat in particular is significantly high in the study area
- Undertaking further research on fuel wood species being used, trends in availability, production etc. and plan for fuel wood species promotion-
- Promotion of 3Fs (Food/fruit, fodder & fuel wood based plantations in agroforestry mode in private and common lands including shifting cultivation patches)

- Promoting use of bio-fuel seeds such as Myrobalans, Thani, Kusum, etc. as alternative fuel energy
- Enumeration of the species can be done for identifying the lost tree species and developing better strategies including regeneration plans
- Promotion of bio-fertilizer/bio-pesticides as a micro enterprise for promoting organic agriculture
- Convergence with line departments for accessing schemes and policy advocacy for energy security initiatives
- Nursery/s with focus on fuel species coupled with fruits, fodder, medicinal plants, etc. so as to sustain the community interest through nutrition/health security besides certain regular income from surplus

Conclusion

As far as the context of the current study is concerned, the main content has been discussed in detail but there were certain points which the team felt is needed to share while concluding.

The study team observed that respondents are not aware of the government schemes on local oil making units. The studied villages are electrified but the problem rectification is not very prompt from the electricity department as these villages are located very remote and difficult terrain. Usually during rainy season and when cyclones hit the area, electricity problems arise and won't be repaired for many days.

Use of charcoal is present here and there but not as the mere source of cooking. It is being used as a supplement for fuel wood in the study area as mentioned above. But as far as the surrounding villages which are located near to the main road or plain areas, preparation and sales of charcoal is being practiced by the tribals which supplements their household economy during lean season for cash income.

Use of liquid petroleum gas (LPG) is almost nil in the study area and only less than 1% of the households have LPG connections. But when it comes to usage, even these households usually don't use it on regular basis. They only use it when there is a specific situation like raining outside where their traditional chullah placed or when unexpected guests arrive or non-availability of fuel wood at home or etc.

In case of implementation of FRA, significant amount of households from the study area have applied for the Individual Forest Rights but very few of them have got titles and there are a lot of issues prevailing with regard to same besides the issue of giving rights over the village commons under Community Forest Rights which is an issue across the State of Andhra Pradesh with their concern relating to Vana Samrakshana Samithis (VSSs) developed by Forest department. Regarding fodder for cattle, there is no specific problem in terms of availability and access in the study area.

Possible action steps based on the recommendations made

Sl. No	Biofuel material	Possible Action Steps			
		Studies & Documentation	Exchange and Education	Govt. Engagement	Community Programs
1	Fuel wood (Earlier used as fuel wood)	Seasonality study (Usage, part collected, flowering cycle, gaps identification, quantum of species availability through transect walks), IEC material	Community meetings (Gram Sabha), CBO meetings, Trainings and Exposure visits	Engagement with line departments (forest and DWMA) community engagement for regeneration, MG NREGS	Awareness programs, orientation on the projects, FGD's, Organization of committees, meeting and trainings, community based initiatives towards energy security (Community nursery, seeds collection, agro forestry model, smokeless chullah), Conservation and protection mechanisms
2	Fuel wood(Existing species)	Seasonality study (Usage, part collected, flowering cycle, gaps identification, quantum of species availability through transect walks), IEC material	Community meetings (Gram Sabha), CBO meetings, Trainings and Exposure visits	Engagement with line departments (forest and DWMA) community engagement for regeneration, MG NREGS	Awareness programs, orientation on the projects, FGD's, Organization of committees, meeting and trainings, community based initiatives towards energy security (Community nursery, seeds collection, agro forestry model, smokeless chullah), Conservation and protection mechanisms
3	Cattle Dung	Livestock health, fodder species, documenting dung usages and prioritizing	Awareness about Biogas, Biofertilizers	Engagement with Animal Husbandry, Agriculture, NEDCAP (subsidies/schemes)	Health camp, knowledge sharing of Vaidya's, Demonstration models of bio gas and bio fertilizers, para veterinary
4	Crop Residue			Engagement with Animal Husbandry, Agriculture Dept.	Use and management of crop residue, demonstration of brickets
5	Kerosene			ITDA and GCC, Weights and Measures	DR Depot level committees to be activated/formed,

				Dept.	Awareness camps, committee meetings
6	Electricity	Collecting data on power availability and distribution	Awareness about effective utilization of electricity in the community	Engagement with gram panchayat level (effective use of electricity for street lights) and electricity dept.	Meeting with ward members, line men for effective use, discuss about solar power and explore opportunities
7	Oil Seeds				
	Forest based oil seeds	Mapping of available oil seed species, Existing practices, status of availability of oil seeds,	Skill development and awareness programs for sustainable collection processes and quality oil extraction methods, exploring university collaboration on innovative techniques	Sharing finding studies with govt., explore schemes	Develop community based plantation model (bio resource), seed collection and nurseries, plantations, aggregation
	Farm based oil seeds				
	Castor				
	Niger	Market study	Demonstration on sustainable agriculture practices	Seeds & Technology	Demonstration models on line sowing (SRI)
	Karanj	Mapping of available oil seed species, Existing practices, status of availability of oil seeds,	Skill development and awareness programs for sustainable collection processes and quality oil extraction methods, exploring university collaboration on innovative techniques	Sharing finding studies with govt., explore schemes	Develop community based plantation model (bio resource), seed collection and nurseries, plantations, aggregation

Scientific names of tree species mentioned in the report

Sl. No	Local Name	Scientific Name	Family
1	Thella Chettu / Yelama Chettu	Anogeissus latifolia	Combretaceae
2	Thangedu	Xylia zylocarpa	Mimosaceae
3	Ganera / Gandra	Albizia odoratissima	Mimosaceae
4	Yegisa	Pterocarpus marsupium	Fabaceae (=Papilionaceae)
5	Thella Maddhi	Terminalia arjuna	Combretaceae
6	Nalla Maddhi	Terminalia alata	Combretaceae
7	Paradonda	Cipadessa baccifera	Meliaceae
8	Jerrimanu	Buchanania lanzan	Anacardiaceae
9	Juvvi	Ficus mollis (=Ficus tomentosa)	Moraceae
10	Pasuru / Patsaru	Dalbergia paniculata	Fabaceae (=Papilionaceae)
11	Lolugu	Pterospermum xylocarpum	Sterculiaceae
12	Subabul	Leucaena leucocephala	Mimosaceae
13	Busi / Nemali Chettu	Vitex altissima	Verbenaceae
14	Palachettu	Holarrhena antidysenterica	Apocynaceae
15	Girugudu	Casearia elliptica	Flacourtiaceae
16	Midatha Donkalu / Vatava Narayana	Ipomea cairica	Convolvulaceae