Source Book

for

Functionaries in Tribal Areas

8

Agriculture and Challenges of Marketing

Tribal Welfare Department, GoAP, Amaravati
Centre for Innovations in Public Systems, Hyderabad
University of Hyderabad, Hyderabad

2018

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Functionaries in Tribal Areas

Volume 8

Agriculture and Challenges of Marketing

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Prof. N.Sudhakar Rao **Prof. BV Sharma**

Editors' Note

Administering the tribes in the country has been a part of the commitment made through the Constitution to strive for their socio-economic development. However, that has never been an easy task despite having specific policy driven formulations, separate administrative machinery, budgetary allocations and fixed targets over the period of six decades. Of the plethora of problems and issues of tribal society, the role of human component remains significant, though relentless efforts have been made to bring forth tangible results in this particular area. Services of trained and dedicated personnel to take up the arduous responsibility envisioned when planned tribal development was envisaged through the establishment of Tribal Research Institutes or Tribal Cultural Research and Training Institutes. The provision for the same was made in various states with the support of Ministry of Social Justice and Empowerment and later Ministry of Tribal Affairs, Government of India. These institutions are expected to impart training to the functionaries of the tribal welfare departments particularly sensitizing them about the tribal cultures, besides undertaking evaluation of various schemes and programmes implemented by the State Governments either on their own funds or with the support of Government of India. These are also to undertake research into the tribal culture, guide policy makers in preparation of special tribal development plans, in addition to suggesting policies required for the speedy socio-economic development of tribes. But unfortunately, the contributions of Tribal Research Institutions and their role in enriching the human power for gearing up tribal development remains deficient till date.

Apart from these institutions, several academic departments in the universities and various social research institutes have also been engaged in studying the tribal issues and their development for meeting academic needs and interests. Among all these, social or cultural anthropology stands out to be a unique discipline that has been concerned with the tribal issues specifically besides other questions relating to either pre-modern or modern or post-modern societies across the globe. The history of anthropological research in India dates back to the colonial period, 1916, initiated by the British administrators and the foundation of anthropological research was laid in 1945 which later became as Anthropological Survey of India that has been completely devoted to the research into tribal culture and the issues of tribal people. India is one of the earliest countries in the world that initiated anthropological research. In the academic arena, the first post-graduate department of anthropology was established in 1920 at the University of Calcutta, and after the independence, several departments are established where anthropological research has been vigorously followed using sophisticated tools and techniques. Apart from these institutional frameworks, the knowledge of tribal issues has also emerged from the government departments such as former Planning Commission, Commissioner for Scheduled Castes and Scheduled Tribes, and National Commission for Scheduled Castes and the same for Scheduled Tribes from their independent studies. Thus, enormous body of knowledge accrued so far, points out to the need of committed human power in the tribal welfare department.

Though academic departments, Anthropological Survey of India, social research institutions and other Government of India departments and institutions have been carrying out research in tribal culture, evaluating the tribal development programmes and so on, yet the Tribal Research Institutes are the direct organs of the state governments

that have been implementing the tribal development programmes. However, whatever be the reasons, the Tribal Research Institutions in the country have not been able to meet the expectations, and in some cases, they have become non-functional or playing a nominal role. Yet, there is an absolute necessity of such devoted institutions and rejuvenation of them is the need of the hour. Whether this happens or not, the tribal development will continue to act as a separate domain given the pace of development of the tribes in the country. The governments continue to engage and deploy their human power and machinery for the cause of tribal development. The officials are agents of the government who are engaged in the development programmes of the tribe and in most of the cases have the knowledge or gained such knowledge of the tribal people on the basis of their personal experiences though they are experts in their own field of specialization. The government is mostly seen, felt and experienced by the tribal people through these officials or machinery of the government. Their expertise in their special fields requires to be synergized with the knowledge about people whom they are serving for obtaining the desired results. Such synergy of knowledge may have eluded a necessary component in their formal training in the expert field, but its significance comes very real in practice. More importantly, the knowledge and sensitivity appear as a big help, when it comes to tribal society which might be different from their own society in which they have grown. Therefore, these officials or functionaries require an orientation towards tribal issues and such orientation could be provided by the Tribal Research Institutions, but such exercises are hardly ever practiced. Nor is there any programme or module or handbook developed so far in the country.

Over the years the there has been a number of high power Committees that have studied tribal issues, submitted reports and made suggestions on the basis of which several Acts are passed and further modifications of the Acts have also taken place. Consequently, tribal policies have also been modified, new regulations have emerged. Simultaneously, the range of tribal issues also got changed/expanded in course of time, new issues surfaced while the old ones persisted or old issues continued with new dimensions. But there is no single source to provide all these changes either in terms of administration or the tribal situations due to scattered information and dispersed sources. Even if the officials working in tribal areas desire to acquire a comprehensive knowledge of tribal issues, and efforts made by the government about the tribal development over the years, it becomes a herculean task to pool together the scattered information to a single place.

From the above discussion, it is needless to emphasise the need for strengthening the human component in the efforts of the tribal development in the country. Though the government realised its importance, there was no concerted effort towards these ends. As there is neither orientation of officials, nor guidelines for such exercise or comprehensive information about the tribal development, the present exercise is mainly aimed to fill this gap.

The sourcebook presented now in this regard is intended for the use of officials working in the government departments concerned with tribal welfare in the light of the above discussion as a guide. It may be used for self-learning or as a manual in the context of training in a formal teaching and learning mode. This document is conceived with three assumptions: (1) many functionaries have little knowledge about the emergence and existence of various Acts, amendments to Acts, schemes currently in vogue (including the spirit and context of a specific scheme; fund position, procedures of sanctions and execution) that are relevant for their functioning; (2) the functionaries working in tribal

areas are short of cultural competency to effectively function and so there is a need to help them to identify where this shortfall could have an impact and how it would affect their successful functioning; (3) working with communities and achievement of community participation is possible only when the functionaries understand the structures and institutions in the tribal communities and succeed in identifying the cultural resources that enhance the participation. Keeping these assumptions in mind, the sourcebook has been planned drawing strength from the anthropological research inputs in terms of tribal culture, evaluation of various development programmes and findings. Further, it has taken into consideration the potential of tribal traditions, knowledge and ethos that can be used for their own development in the contemporary political and economic backdrop. The sourcebook is expected to provide not only required knowledge on tribal society and its issues, development efforts but also motivation that the reader would need for committed service.

The source book is designed in nine volumes. Volume 1 contains units that focused on themes which are assumed to be of general interest and which provide the prerequisite information that enables comprehension of information provided in the other units. Volumes 2-9 are meant for functionaries of different departments and working in the tribal areas. The themes or units covered in the general section include 'Indian society: Indigenous populations, Scheduled Tribes and Scheduled Castes' that provides the background of tribal society in Indian context, and the theme 'Building Emphatic interactions with Tribals' is very important as it discusses the relevance of humanistic approach to the tribal issues for the ethnocentrism has been a great impediment for the proper attitude towards the tribe around the globe. 'Approaches to Tribal Policy and Tribal Development' is the general theme that highlights the basic philosophical framework of the government of India in which tribal development is conceptualized. The theme of 'Role of Traditional Leadership and Tribal Institutions in Development Process' has been included in this section to show forth the significance of leadership in the tribal society and because harnessing this resource is utmost important for ensuring community participation. The theme 'Constitutional framework, Human Rights and Child Rights' elucidate the concerns of the state about the vulnerable nature and precarious conditions of the tribes who live in close interaction with the surrounding, dominant non-tribal society. The theme 'Contemporary Tribal Challenges' discusses not only the age-old problems but also the new problems emerging through new interventions and problems emanating from the modern society. The section also includes the themes 'Tribes in Andhra Pradesh: Diversity and Social Organization' which gives the brief account of the tribes of Andhra Pradesh and 'Social organization among the tribes of Andhra Pradesh'. The inclusion of this theme has been considered important keeping in view the need to have a general understanding of demography, culture and society of tribes in the State. Thus, this section provides general reading necessary for all functionaries regardless of their expertise or professional background.

The volumes 2-9 are meant for role-specific professionals working for different departments such as (1) Revenue; (2) Police; (3) Forest; (4) Health; (5) Education; (6) Development (including Agriculture); (7) Panchayat Raj; (8) Marketing and (9) Youth Welfare; Entrepreneurship development, Tourism and Culture. The themes covered in these different sections are to facilitate the functionaries for enhancing their knowledge and skills on issues that are important for their specific roles in their respective departments. What guided while designing these sections, are the following concerns:

The Revenue deals with a range of aspects covering not only land issues but also the issues of tribal identity certificate, and in this case there have been problems. For example, land alienation is an issue in Scheduled V area but at the same time, there is a problem of land acquisition by the state itself against the interest of the tribes. There have been several interventions through the enactment of Acts and the officials should be familiar with these. In Police department, the issues are related to not only atrocities committed against the tribes but also Naxalism and tribes being sympathetic with those who raise arms up against the state. The customary law of the tribes takes care of the majority of law and order situation, but at times police intervention becomes necessary as the former cannot remain outside the statutory law, court and legal matters. Forest is the soul of the tribes, and therefore, the life of the tribe has been strongly intertwined with the forest department. Involving the tribes with the activities of the Forest department deserves the highest priority, but synergy in this regard is yet to be achieved despite the state's recognition of this vital issue decades ago. The departments concerned with Health, Women and Child Welfare and Public Health engineering are crucial as the environmental degradation, population growth, contact with non-tribes etc., have a significant impact on the tribal health. The tribal indigenous systems continue to be a great source of maintaining health, yet there are limitations of structural kind, and as we can reflect more, we are able to see that the tribes have not been averse to the modern health practices also as well. However, there is a need for bringing these systems together for improving the health standards of tribes.

The role of Education department in tribal society is immense; it is obvious, through education only, the tribes can face the modern world with better preparation. Though some progress has been made there is a lot to be achieved, and a number of hurdles are there on this road yet to overcome. The departments concerning the Infrastructure, Housing, Agriculture and allied activities play a crucial role in the overall development of the tribes. The officials shall ensure community participation by being empathetic and sensitive to the needs of people and understand the cultural ethos and recognizing the local resources and time-tested indigenous knowledge. Finally, the departments that deal with the Youth Welfare, Entrepreneurship Development, Tourism and Culture actually shall guide the future generation and equip it to meet the present challenges and prepare for the future with certain innovative ideas. They should be creative and develop the habit of thinking out of the box, and exploit the tribal potential for their own good. Thus, in brief the volumes 2-9 form the core of this exercise in reorienting, re-equipping, rejuvenating the functionaries or officials and providing material on tribal development in a holistic perspective.

Finally, we shall say that it is a unique experience of bringing together several renowned and experienced resource persons to share our ideas with them and receive their reflections and also convince some of them to contribute to this volume. We sincerely acknowledge their help and are really grateful to each of them. Since it is the first of its kind on the tribal development in the country, we are sure this sourcebook is not free from some omissions and commissions. We will surely rectify these in the subsequent edition once we get feedback on the present volumes.

Prof. N. Sudhakar Rao **Prof. BV Sharma**

1 Promotion of Agriculture in Tribal Areas

National Workshop on Empowering Farmers of Tribal Areas; 7-8 June, 2017

Select recommendations

- There is need to make application of modern agricultural techniques in the tribal areas
- Secondary horticulture needs to be popularized for income enhancement in tribal areas.
- Organic farming needs to be promoted in tribal areas by establishing market linkages through involvement of different stakeholders for providing better returns to the farmers.
- Agriculture allied activities such as lac cultivation and processing, bee keeping, backyard poultry, grading, processing and value addition need to be up scaled in the tribal areas.
- Protected cultivation of flowers in hilly areas needs to be promoted to enhance export potential.
- Formation of cluster of entrepreneurs at village level for enhancing the collective bargaining of the rural entrepreneurs should be considered.

Source: https://kvk.icar.gov.in/news/Preliminary Report %20on%20Tribal%20Workshop.pdf (12-4-2018; 7.15 a.m.)

- *What challenges you think you would face for the implementation of the above recommendations in the tribal areas you are working?*
- *Don't you think that social and cultural inputs are required for such interventions in the lives of tribes?*

Contents

1. Introduction

Agriculture started as a means to meeting the food requirements of the family has evolved over the years first into barter and then sale of produce to exchange or buy other items of food and clothes etc., from others. The state of agriculture in any society is also seen as indicator of development of society from self- sufficient to food surplus. The agriculture in India has rapidly moved up in terms of technology adoption and also cost of cultivation due to higher input levels over last forty years after green revolution (early 70s). Green revolution has also led to massive improvement of production in Indian agriculture. However, it is seen that green revolution has largely bypassed tribal areas due to isolation, lack of extension efforts and lack of resources for investment. The tribal agriculture in general can be seen as extensive, low input and low surplus generating. At the same time while perils of green revolution like excessive application of fertilizers and indiscriminate use of pesticides have affected the agriculture elsewhere, the tribal agriculture has remained by definition organic in most places. It is therefore time for improving the production and productivity of tribal agriculture by suitably developing / adopting the package of practices that can sustain the natural resources like land and water without compromising much on financial viability of agriculture as a vocation. The present chapter is an analysis of status of agriculture in tribal areas in general, their characteristics and ways to improve the same by adopting sustainable practices for overall economic development of tribal population.

2. Learning Objectives

Keeping the above in view, the unit expects the trainees to know about:

(1) Status of tribal agriculture;

(2) Unique characteristics of agriculture in tribal areas;

(3) Options and opportunities for development of agriculture in tribal areas;

(4) Sustaining the development efforts; and

(5) Role of Government and NGOs in transforming agriculture in tribal areas.

3. Agriculture as Practiced in Tribal Areas

It is well documented that the agriculture changed human beings from hunting to food gathering to food production. Selection of better plant variety was foundation of the modern agriculture. Later on they paid attention to improving the fertility of land and supply of irrigation. However, in this evolution, the pace of tribal population was rather slow and many practices like supplementing the land with nutrients, application of plant protection techniques and/or use of high yielding seeds/seedlings have remained a distant dream in tribal area.

The tribal population constituting around 8% of the population is mainly dependent on forests, livestock and agriculture. But the denuding forest resources, shrinking water table and poor fuel and fodder supply have jeopardized their agriculture and livestock productivity. The small and marginal, fragmented and un-irrigated holdings capable of raising a mono crop and low productive livestock population do not provide adequate resources and income for the tribal livelihood. Such factors, including their bigger family

size, compel them to starve or migrate to nearby towns and many a time to distant localities for subsistence.

Efforts are being made by the Government and Non-Government Organizations (NGO) to provide financial and technical assistance to the tribal communities through various schemes and development programmes in the country since independence. These existing development schemes offer some relief to the tribal communities, but there is a recurrent relapse to poverty due to various reasons.

According to the statistics of Department of Agri., Cooperative and Farmers Welfare, area under non-agriculture use has increased by 9.78% in 2013-14 over that of 2003-04. This suggests that there is constant threat to the cultivated area due to anthropogenic intervention. This has also built pressure on the forest fringes where tribal communities are dominant. Although there is restriction on transfer of tribal land by the non-tribal communities, unauthorised encroachment of tribal forest fringes are very common.

3.1. The Agricultural Practices by Tribal Communities

The agricultural practices by tribal communities per se can be broadly divided into three categories based on adoption of agricultural practices which again depends on the exposure to technology, market forces and natural resources at their command etc.

a. Primitive Agriculture and practice of shifting cultivation

b. Assimilated tribal communities and adoption of modern practices

c. Agriculture near urban agglomerates and vegetable centric agriculture

A description of each system is given below along with cultural practices and implication on land use, productivity and impact on livelihood of the farmers.

3.1.1. Primitive Agriculture and Practice of Shifting Cultivation

Agriculture in tribal areas is very diverse. In places like north eastern region as well as part of Andhra Pradesh, Odisha etc., *jhum* cultivation is practiced. *Jhum* also known as the slash and burn agriculture, is a method of cultivation where forest vegetation is cleared by burning and put into cultivation for 3-4 years and again shift to new areas. In the earlier years when the land rights were not clearly defined, the rotation period (the period between abandoning a *jhum* land and returning to same patch) was fairly long enough for area to recuperate. However, with population pressure and more clear land rights (mostly undocumented/ unclear), the rotation period has decreased and stress on lands has increased multifold making it more denuded and bereft of nutrition. The productivity has decreased and later the lands were totally left out even without root stock for regeneration. As per various studies and reports the areas under *jhum* cultivation are reducing due to different measures adopted by the Government too.

Jhum Cultivation and Climate Change

The burnt soil contains potash which increases the nutrient content of the soil. This system of agriculture encourages degradation of natural forest. About 8.4 lakh metric tonnes of biomass gets lost due to burning of trees resulting in a huge emission of carbon monoxide, carbon dioxide, nitrous oxide and other gases resulting in building in greenhouse gases.

Majority of tribal hamlets are located in forest fringes and lands are degraded and low in fertility. The lands are put to use for cultivation of minor millets and pulses. The prevalent crops cultivated in such fringe areas are jowar, bajra, finger millets and red gram. The system of cultivation is also very traditional and broadcasted. Normal operation like, weeding and intercultural operations are not done in the area. All these factors make the tribal agriculture unproductive and unviable. The damage of crops by wild animals also dissuade tribal communities to go for high value crops.

3.1.2. Assimilated Tribal Communities and Adoption of Modern Practices

Various States have initiated extension schemes under GOI (ATMA) and State Government funded projects for popularizing the modern agriculture practices. Some of such initiatives include:

- Subsidies for seeds/ fertilizer and opening of dealerships in far flung areas;
- Promotion of line sowing;
- Subsidies under farm mechanization;
- High incentives of agro processing and post-harvest equipment; and
- Credit promotion through PACS and LAMPS.

The agriculture universities and research stations located in tribal areas have also made impact on adoption of technology by tribal communities. As a result, we can see many areas where tribal agriculture can be compared to main stream agriculture in terms of technology adoption, productivity or any other parameter. One of the best examples for this change is Nabarangpur district of Odisha where productivity of maize by tribal farmers is equal to and some times better than non tribals.

3.1.3. Agriculture near Urban Agglomerates and Vegetable Centric Agriculture

The influence of market decides the cropping patterns near the urban agglomerates. The vegetable growing is popular across the country near to the cities and towns and tribal agriculture is no different. Proximity to city also helps them in accessing the inputs, availing of training and extension support and also they can have advantage of better market intelligence. One can see good vegetable cultivation in areas close to Araku valley in Andhra Pradesh, Koraput district of Odisha, Ranchi in Jharkhand and near Raipur in Chhattisgarh.

4. Unique Characteristics of Agriculture by Tribal Communities

Unique characteristic of tribal agriculture is its 'extensive' nature. In the absence of assured irrigation, the agriculture is mostly confined to monsoon season or Kharif season. Either a single crop or mixed crop is grown during monsoon only. Single crop with limited assured/no irrigation makes tribal agriculture highly risk prone and unviable.

The tribal agriculture is believed to be organic by default. This is a positive feature because agriculture becomes sustainable if more natural inputs are used in farming. However, the nutrient mining of soil by the continuous cultivation needs to be replenished

by incorporating organic matter/ Farm Yard Manure (FYM). Again low productivity due to natural farming has to be compensated by offering premium pricing of the products. There is need for organised market for organic products.

The concept of contract farming can be instrumental in linking corporates with the small tribal families. The Non-timber based forest produces, herbs, aromatic plants can be good source in tribal agriculture. Therefore the idea of farm to fork or plough to plate need not be confined to modern agriculture; this holds good for tribal agriculture also. This necessitates forming the farmers into farmers' collectives who can aggregate the raw material for the market. The role of producers' organisation will be paramount.

5. Opportunities for Development of Agriculture and Selection of Options, Development of Farmer Led Seed and Input Production and Distribution Systems

The agriculture in tribal areas needs a better handling. Advocating intensive agriculture in this fragile eco-system may have deleterious effect. Planning a location specific soil and water management is to be attempted simultaneously before embarking on a plan for agricultural development. Therefore, department of soil conservation/watershed development along with department of agriculture, Agriculture University and extension agents need to plan for comprehensive development through watershed planning.

Watershed Development

Watershed is a geographical unit delineating an area that drains into a common outlet. Though it is an area with natural physical boundary, watershed development is a holistic term used by planners to encompass development of all natural resources, jal, jangal, jeev and jeevika, (water, forest, life forms and livelihoods) on a sustainable manner. The projects envisage bottom up planning involving local communities by mapping the resources through an intense and participatory approach.

Most of development agencies including State Government agencies have been implementing watershed development projects. These projects traditionally concentrate on soil and moisture management so that erosion is prevented and ground water regime is improved. In the absence of proper water harvesting structures, though the water percolates improving ground water regime, the benefit will be seen more in the lower catchments and plain areas than in the upper catchments. Hence the projects aiming at tribal communities need also to plan for some surface water harvesting structures along with water lifting devices. The steps involved in the process are given under:

a. Mapping of the tribal belts with regard to vulnerability index should be attempted. Agriculture to be adopted based on the Land Capability Classes (LCC). The classification involves mapping the soil texture, structure, vegetation, slope etc., so that the most suitable end use can be planned. Areas not suitable for cultivation i.e. Class V & above should be protected with adequate forest cover.

b. Agriculture has to be coupled with soil and water conservation measures. If agriculture is adopted in hill slopes, it should be cultivated across the slope and suitable soil conservation measures like contour bund, stone bunding should be prescribed.

c. Developing a Package of Practices (POP) for tribal agriculture: In the absence of proper farm mechanisation, tribal agriculture is highly labour intensive. Therefore, crop specific PoP has to be designed in such a way that the community can adopt easily.

d. Developing area specific variety: Tribal agriculture is predominantly rain fed; therefore agriculture scientist should focus on short duration, drought tolerant varieties keeping in mind the requirement of tribal families. Mixed cropping and intercropping will play an important role in mitigating risk of the tribal farmers.

e. Commercial cultivation of horticultural crops, mainly, aromatic and herbal crops should be taken up where requirement of water is minimal. Micro-irrigation method may be encouraged so that there is limited pressure on ground water.

The most important aspect is involvement of community at every step so that present use is properly mapped and future use is as per local acceptability. *Shramdan* (voluntary labour) is another important aspect where local community and individual families contribute by way of labour for development of land and vegetation so that they develop a sense of ownership and pride in the whole effort.The sense of ownership also ensures the transparency required for such projects as the persons who have contributed *shramdan* are found to be more assertive about their rights and also keep an eye on activities and expenditure involved.

Shramdan

Concept of *shramdan* involves contributing to public cause by individuals by way of working free. In the NABARD assisted Watershed Projects, the first step, is all the able bodied persons contribute four days of *shramdan* per family for a soil and moisture conservation work like formation of new pond, deepening existing structures or even constructing new check dams using local materials. This is a sort of entry level test for assessing the commitment of community and their unity.

During the implementation period, they need to contribute 16% of labour component. The 16% would mean one day in a week of six working days. The community gets geared up for the work and it has worked wonders across the country.

6. Sustaining of Development Efforts

For sustaining development initiatives of different stake holders there is need for institutional mechanism in the tribal area. The community based institutions which will play major role are watershed development committees, Joint forest management committees, SHG, JLGs, and Producers' Organisations etc.

The watershed development committees have all the families in watershed as members with an executive committee drawn from all hamlets within watershed area. They are the project holders for watershed development and they plan and execute all development initiatives for soil and moisture management and livelihood initiatives including agriculture. While the watershed committees mainly involve dealing in public funds for

treating land(both public and private) and creating/augmenting common property resources like forests and grazing lands etc., the watershed plus activities involve post development maintenance of created assets, arranging loans for individuals and groups within etc.

The women members of tribal families can organize themselves in informal group of 10-20 and form SHGs. The 25 year models have proved that SHG model can augment the saving habit, meet the loan requirements of the individual members and act as catalyst for social development. The SHGs can also federate into a village level federation. Similarly, Joint Liability Group (JLG) can organize the farmers to avail credit for farm as well non-farm loan. A Producer Organisation (PO) is a legal entity formed by primary producers, viz. farmers, milk producers, fishermen, weavers, rural artisans, craftsmen. A PO can be a producer company, a cooperative society or any other legal form which provides for sharing of profits/benefits among the members. In some forms like producer companies, institutions of primary producers can also become members of PO.

The main aim of PO is to ensure better income for the producers through an organization of their own. Small producers do not have the volume individually (both inputs and produce) to get the benefit of economies of scale. Besides, in agricultural marketing, there is a long chain of intermediaries who very often work non-transparently leading to the situation where the producer receives only a small part of the value that the ultimate consumer pays. Through aggregation, the primary producers can avail the benefit of economies of scale. They will also have better bargaining power vis-à-vis the bulk buyers of produce and bulk suppliers of inputs.

7. Transforming Tribal Agriculture: Role of Government, NABARD, Banks and NGOs

Central and state governments can support the tribal agriculture by following means:

Watershed Development: Government of India since independence is implementing plethora of projects by Agriculture department, Rural Development Department and Forest and Environment department to sustain productivity of the land. The programmes were Integrated Watershed Development programme, Drought Prone Area programme, National Watershed Development Project for Rainfed areas (NWDPRA), Hariyali project. The latest project is being implemented under Pradhan Mantri Krishi Sinchai Yojana (PMKSY).

Infrastructure support: Support by way of construction of connecting roads, rural godowns, drinking water, sanitation etc. can be extended by governments. Roads will facilitate supply of agriculture inputs and marketing of products in the nearby locality.

NABARD has been working to design a programme to take care of the economy of the tribal community. The migration prone community requires regular income and asset in their place of residence. NABARD in association with BAIF have developed model called WADI for development of the tribal families through horticulture. (Explained fully in the next unit). NABARD has also developed products like Kisan Credit Card (KCC) and Joint Liability Group (JLG) to facilitate sanction of credit to farmers. KCC is an instrument through which farmer can avail hassle-free loan at a very cheap rate of interest. The farmers not owning proper land records can avail farm credit in JLG mode. In JLG mode 4-10 farmers can join hands and avail loan through mutual guarantee.

Madhya Pradesh Shows The Way

In Dharaav village of Hoshangabad district (Madhya Pradesh) tribal farmers practice 'utera' system of cultivation. Under this mixed farming system seeds of several cereals, millets and legumes are sown together at the same time in or around June. 60 year old farmer Ganpat says that absolutely no cash expenditure is incurred in this farming. These farmers save seeds from the previous year's crops. Farm animals fertilise the fields with manure while the crop residues of this organic mixed farming system, completely free from chemical poisons, provides nutritious food for bullocks, cows and other farm animals. Mixed farming of grains and legumes ensures that soil fertility is maintained. If one crop fails due to some reason, other crops of the mixed farming system enable farmers to survive despite some loss.

In Dindori district (Madhya Pradesh) Baiga tribal communities practice 'Benvar' agriculture system. Gothiya, a farmer of Kandabani village explains that during early summer small bushes and branches, fallen leaves are lit up in a fire. In this thin layer of ash mixed seeds are scattered. After about 3 years the site of farming changes. However after resting the land soil for some time, the tribal farmers again return to this land after 9 years.

About 16 crops are routinely grown in this mixed farming system. These further have about 56 varieties. Various crops support each other in this mixed system. The bigger plant growth of maize protects Kulthi from strong winds. Legume crops make up for the nitrogen taken up by cereals.

(Understanding Tribal Agriculture By Bharat Dogra and Baba Mayaram)

8. Aggregation and Marketing

A major challenge with small farmer agriculture and horticulture is marketing of produce and realizing a remunerative price for the same. The farmers carry the produce to the local *haats (shandies/ santa)* and sell them to local buyers in the market. In the absence of volumes and with almost no pre-processing, the farmers get very low rate and cheating on price and weight is not uncommon. As the quantity produced by each farmer is normally less, when the farmer carries the same to market, he incurs huge cost in terms of transportation and loss of wage labour. Producers' Organisations as discussed earlier in the chapter can offer solutions in terms of aggregation/pooling, sorting, grading, drying, pre- processing and common marketing. Marketing and Pricing of such product will have rich dividends in terms of better bargaining power and creation of local employment. As the POs grow in terms of experience and financial strength, the higher order processing can be attempted and farther markets can be reached over a period of five to seven years.

The public effort in marketing is also equally important for better remuneration to the farmers. Some of the initiatives that are being taken by State Governments and other agencies include:

- Improvement of shandies;
- Development of storage space in rural areas;
- Drying yards at village level;

- Subsidies for post-harvest equipment;
- Capacity building of the communities on post-harvest technologies.

9. Designing a Project for Improving Farm Productivity

As already mentioned earlier, the tribal agriculture has specific issues related to low productivity and the same needs to be addressed through a multidimensional approach. The projects so designed need to take following factors into consideration.

- Risk reduction;
- Sustainability;
- Institutional building;
- Localised production of inputs and services for effective door-step delivery;
- Inherent weaknesses in extension services and geographical isolation.

9.1. Lessons Learnt from the Pilot Project in Balasore, Odisha

Based on Pilot Project for Augmentation of Farm productivity implemented in Balasore District, Odisha by NABARD[1], the following strategy specific recommendations can be made:

For increasing the crop productivity:

(a) promoting use of appropriate crop varieties;

(b) improving the health of soil and thereby its productivity potential;

(c) planning for timely delivery of required production inputs, specifically quality seeds; and

(d) putting in place an effective technology transfer system from the technology store houses to the last mile farmer.

For increased net income from crop production:

(a) reducing labour component of cost of cultivation of crops by promoting mechanization of farm operations;

(b) reducing cost on material inputs, especially chemical fertilizers, through promoting use of organic and biological sources;

(c) strengthening post production infrastructure, especially storage, so that the farmers do not resort to distress sale; and

(d) encouraging supportive income generation from freshwater fishery resources available with a majority of the farmers.

The identified activity at the ground level needs to serve one or more objectives of cost reduction, increased production, increased income or drudgery reduction. For example the Pilot Project had identified problems with Paddy in the district as under:

[1] The project was implemented in 1882 villages out of 2586 inhabited villages in Balasore District in all the Blocks and 282 Panchayats out of 289 Panchayats.

Specific Issues: Seed Related

- The cost of seed is less than 2% of total cost of cultivation for paddy but has great bearing on productivity. The farmer uses about 20 kg of seed per acre at a total cost of Rs 500/- per acre. The cost of cultivation is between Rs 15,000 to Rs 20,000 depending on agronomical practices and input application.
- Variety matters and the variety also varies with time of sowing/transplanting which sometimes are not in the control of farmers.
- The quality parameters vary widely between various sources of seeds and also the way they were stored at different locations.
- Non Availability of suitable high yielding varieties can lead to areas remaining fallow.
- Non suitability of variety leads to very low productivity or damage of crop in extreme situations.
- The existing supply chain of dealers may not always be reliable as they may like to push what is available and gives them high margin and not what is required.
- As the cost of seed is not a significant cost in terms of overall cost of cultivation, farmers are not price sensitive.

Specific Issues: Fertilizer Related

- Cost per acre is much higher when compared to seed.
- Dosage is soil and plant dependent but farmers have low level of education on right dosage for his field based on nutrient requirement.
- Non availability becomes an issue.
- Carriage costs also play an important factor in overall price of fertilizer as it is a bulky item and transport costs are high.
- Delivery at door step can reduce costs to farmers significantly.
- Not much difference in quality parameters of various companies.

Specific issues: Pesticide related

- The requirement is not pre decided, but urgent whenever requirement emerges.
- The item is not bulky but costly. The carriage costs are less.
- The specific knowledge of pesticides, type, usage, dosage, time of application etc. is a significant missing link.
- The quality/genuinity plays a significant role as fake pesticides are not uncommon.
- The cost on pesticides is a significant cost in kharif, but normally less in Rabi.

- The damage potential of non-application or wrong application is very high.
- Framers' knowledge is limited about suitable pesticide and dosage etc. He depends on the pesticide dealer who is likely to push which gives him highest profit margin irrespective of necessity.
- The knowledge of dealers itself about suitability of pesticides is most times limited who in turn depend on sales personnel of pesticide companies who may or may not guide them properly.

9.1.1. Technological Interventions in the Balasore Pilot Project

Based on the issues identified the technological interventions were designed as under:

- Promoting appropriate varietal replacement / diversification under different growing conditions and seasons.
- Promoting line sowing in areas where broadcasting is done and line transplanting in areas where traditional transplanting is adopted.
- Demonstrating and promoting System of Rice Intensification (SRI) during Rabi.
- Demonstrating and promoting soil organic matter build up by promoting *in situ* cultivation of leguminous green manure crops like *dhaincha* (green manure crop sown before main Kharif crop) and incorporation of its biomass.
- Promoting use of bio-fertilizers, through the following means:
- Culturing and inoculating with Azolla for encouraging biological nitrogen fixation.
- Promoting use of nitrogen-fixing bacterial (Azospirillum / Azatobactor) and Phosphate Solubilizing Bacterial (PSB) cultures for biological nitrogen fixation and increasing availability of fixed soil phosphorus.
- Promoting low cost open field vermi composting technology, which can be taken up by all the farmers individually.
- Seed treatment with fungicides for controlling seed-borne diseases.
- Adoption of soil-test based nutrient / fertilizer application/ management.
- Promoting Integrated Pest Management (IPM) measures.
- Planning for promotion of production and supply of required quantities of quality seeds by encouraging seed village programmes within the district or plan in other suitable areas outside the district with a market tie up.
- Promotion and supply of seeds of Green Manure crops (*dhaincha*).
- Creating awareness and promoting appropriate farm implements / machinery like rotavators, transplanters, and weeders, harvesters for mechanisation of various farm operations in paddy cultivation, so as to reduce dependence on farm labour and reduce cost of cultivation.

9.1.2. Possible Impact of the Interventions on the Economics of Farm Operation

Sr No	New practice	KP*	RP*	Contribution to			
				PI*	CR*	DR*	QI*
1	Varietal Change	Y	Y	Y	Y		
2	Seed cleaning	Y	Y	Y	Y		Y
3	Seed Treatment	Y	Y	Y	Y		Y
3	Seedling treatment	Y	Y	Y	Y		
5	Line sowing / line transplanting	Y	Y	Y	Y	N	
6	Modified SRI		Y	Y	Y	N	
7	Application of herbicides	Y	Y	Y	Y	Y	
8	**IPM**						
8.1	Pheromone traps	Y	Y		Y		
8.2	Bird perches	Y	Y		Y		
8.3	Trico cards	Y	Y		Y		
8.4	Tricogama virdi				Y		
9	**INM**						
9.1	Green manuring	Y			Y		
9.2	Azolla Application	Y	Y		Y		
9.3	NADEPcompost application	Y	Y		Y		
9.4	Vermicomposting Application	Y	Y		Y		
9.5	Owing Azolla, NADEP, Vermi Pits	Y	Y		Y	N	
9.6	Seed/soil treatment						
9.6.1	Azospirullum	Y	Y	Y	Y		
9.6.2	Azotobactor	Y^	Y^	Y	Y		
9.6.3	Phospho Soluble bacteria (PSB)	Y	Y	Y			
10	**Soil/Plant Application**						
10.1	Application of gypsum			Y	N		Y
10.2	Paper mill sludge for acidic soils	Y	Y	Y	N		
10.3	Application of zinc sulphate and dap	Y	Y	Y	N		Y

Sr No	New practice	KP*	RP*	Contribution to			
				PI*	CR*	DR*	QI*
10.4	Application of DAP, ammonium sulphate & borax			Y	N		Y
11	**Farm Mechanisation**						
11.1	Summer Ploughing with Rotovator/deep ploughing	Y		Y	Y		
11.2	Machine transplanting	Y	Y	Y	Y	Y	
11.3	Weeding through cono weeder/power weeders	Y	Y	Y	Y	N	
11.4	Harvesting/ threshing - small equipment(s)	Y	Y		Y	Y	
11.5	Use of combined harvestor	Y	Y		Y	Y	

KP: Kharif Paddy; RP : Rabi Paddy, PI : Productivity improvement; CR : Cost reduction, DR : Drudgery reduction, QI : Quality Improvement; "Y" indicates possible positive impact and "N" indicates possible negative impact[2].

9.1.3. Convergence Efforts

It is well established that agri-extension system and other services have a significant role in enhancing the productivity and crop income. There are number of agencies like Central Rice Research Institute (CRRI), Department of Agriculture (D.A), State University of Agriculture and Technology and Associated colleges like College of Agriculture and College of Agriculture Engineering and Technology, Krishi Vigyan Kedra (KVK), Non-Governmental Organisations, Banks etc. As such the need for convergence of efforts of the agencies is well recognized in the project and so specific responsibilities were envisaged for different organizations.

[2] It is to be noted that the impact of individual operation cannot be measured in isolation as some of the interventions shall have multiplier effect when taken up with some other operation. For example, line sowing without proper weeding can reduce the impact whereas the same with proper weeding can help increase the tillering which in turn leads to increased productivity. Timely usage of weedicides coupled with line sowing can reduce the cost of weeding itself. The lower weed count can positively affect the fertilizer availability to the plants and better aeration of field leading to higher productivity.

It also needs to be noted that what operations that can be practiced in Rabi season may not be practical due to field conditions of continued rain and submergence or flowing water conditions in Kharif. For example application of fertilizer or Azolla in Kharif is impaired if there is flowing water in the fields.

Roles and Responsibilities of Agencies Involved in Project

Sr. No	Agency	Role Envisaged
A	Extension Services and Technology Transfer	
1	Odisha University ofAgriculture and Technology (OUAT)	i. Storehouse of technologies at the state level and the mosta-ppropriate ones are transferred from its research wings through KVK. ii. Provide exposures and conduct need based short termcourses (up to one week) for the Master Farmers, NGO staff and Cadre of Professionals. iii. Organise / supply Foundation Seeds of some of the selected varieties of lead crops identified in the project.
2	Central and State Level Research Institutions Central Rice Research Institute(CRRI) Central Institute for Freshwater Aquaculture(CIFA) Centre for Women in Agriculture (CFWA) etc.	i. The technology advancements from these Research Institutes and research centers will be transferred to the district through KVKs. ii. Provide exposures and conduct need based short term courses (up to one week) for the Master Farmers, NGO staff and Cadre of Professionals.
3	Krishi VigyanKendra (KVK), Baliapal and Bhadrak	i. Suggest appropriate location-specific, crop-specific and generic technologies which will have impact on crop productivity and required to be transferred from lab to land. ii. Design and conduct crop-specific and technology-specific training programmes to the Master Farmers, NGO staff and Cadre of Professionals. iii. Design and provide faculty support for the Comprehensive Training Programme for creation of Cadre of Professionals. iv. Guide and whet the training materials that may be developed by NGOs for dissemination to the farmers. v. Provide direct interaction and advisory services to the Technology Transfer Centres (TTCs) of the NGOs. vi. Provide soil analysis services and issue soil health cards. vii. Establish model demonstrations for first hand appreciation of technology by other stakeholders. viii. Undertake occasional field visits to some of the demonstration areas and provide appropriate guidance and future strategy.

Sr. No	Agency	Role Envisaged
4	Agriculture Technology and Management Agency (ATMA)	Associate with block level training programmes.
5	Suppliers of Machinery and inputs	i. Organising camps on technology to the farmers at the village level with the help of department and NGOs. ii. Timely supply of inputs. iii. Stocking fertilizers before season . iv. After sales service at field level.
6	Master Farmers, Farmers Clubs and Federation of farmer clubs. There are about 115 farmers clubs mostly promoted by banks and very few promoted by NGOs in the district.There were no federation of farmers clubs in the district and same were to be formed during the course of the project.	i. Master Farmers will be identified from among farmer club members and will be given higher responsibility with rewards system. The better performing farmers clubs will be graduated to farmers club federations on the lines of producer companies. ii. Coordinate with NGOs in establishing, operationalising and monitoring of demonstrations. iii. The programmes of farmers clubs will be preplanned and focused only on specific identified technologies. iv. Follow up on actual field level implementation of technology. v. Organise field visits to other farmers from non-demo villages to the Demo project villages. vi. Act as disseminators of crop advisory and weather forecast information received from the service providers to the fellow farmers.
B	**Services (Inputs, Machinery for hiring, credit, etc.)**	
1	Line Departments	i. Input budgeting and ensuring allocation of fertilizer / seed,etc., for the district. ii. Planning and arranging for adequate supply of farm machinery and other inputs which are provided to the farmers with subsidy.
2	Primary Agriculture Cooperative Societies (PACS)	i. Supply of inputs like fertilizers and seeds. ii. Establish Farm Machinery Hubs (selected PACS) for providing their services on custom hiring to the interested farmers in the areas of their operation. iii. Extend credit for crop loan and purchase of small implements and machinery by individual and groups like farmers clubs, JLGs, PACS, etc.

Sr. No	Agency	Role Envisaged
		iv. Create storage facilities for material inputs as well as farmers produce. v. Provide the services to the farmers through farm mechanisation hubs and seed sales etc.
3	District Central Cooperative Bank(DCCB),Regional Rural Banks(RRB) & Commercial Banks(CBs)	i. Provide loans of higher limits for SHGs for procurement of machinery for local hiring and own use. ii. Provide loans of higher order to farmers clubs federations / individuals for purchase of machinery, creating storage infrastructure, etc.
4	Cadre of rural professionals and freelance experts	i. Provide supplementary services on soil testing (on payment basis). ii. Associate with PACS (on job) or independently set up technology transfer centres and provide the e-services, technology dissemination to the farmers. iii. Undertake repairs / servicing to small farm implements. iv. Act as Para Vets and provide farmers level Veterinary services and AI for animals (self-employment on payment basis). v. Provide farm advisory services (as the operator of TTC run by PACS). vi. Preparation of bankable schemes for individuals.
5	Odisha State Seed and Organic Produce Certification Agency **(OSSOPCA)**	i. Registration of Seed Plots. ii. Seed Certification.
6	Odisha State Seed Corporation	i. Supply of foundation seed (for seed village programme)and certified seed (for crop production). ii. Procurement of seed.
7	Seed Processing Unit	Processing of seeds produced in the seed village programme.
8	Farmers Clubs / SHGs	i. Hiring of small farm implements. ii. Local dealership of seeds at village level. iii. Storage facilities like bins for storage of seeds.
9	Individual farmers	i. Setting up of demonstrations as envisaged and operationalising them as recommended by experts. ii. Production of certified seeds under Seed Village Programme and ensure large scale spread of use of such seeds through exchange or sale for price.

Sr. No	Agency	Role Envisaged
		iii. Production and sale of organic inputs. iv. Adoption of Technology. v. Reporting correct data. vi. Attend all meetings /visits etc.
C	Storage and Marketing of Produce	
1	PACS	i. Procurement of grains under Government Procurement programme. ii. Procurement of inputs in time and supply thereof.
2	Farmer Club Federations and SHGs	i. Procurement of Vegetables and other produce for marketing. ii. Village level storage for seeds, farm produce.
3	Millers	Processing and storage of grains.
D	ICT Services	
1	KVK and ATMA	Preparation of Farm advisories.
2	Dedicated Agencies	Broadcasting of specific messages on weather, farm advisories and marketing information.
3	PACS	Display boards and word of mouth publicity.
4	NGOs and barefoot professionals	Display boards and word through mouth publicity.

9.1.4. Results from the Project

The increase in the productivity is as under

Block/Field Office	Pre -Project	Post Project 2014	Increase w.r.t. Pre-project (%)
Oupada (Tribal Block)	5081	5448	7
Nilgiri (Tribal Block)	4691	5823	24
All Blocks	4278	5608	31

The tribal Blocks have least risk due to location away from sea and good rainfall. So productivity is more than district productivity. Even then, further increase could be achieved.

10. Way Forward

The development of tribal agriculture is closely linked to development of common resources namely land, water and forests. The good intentions without proper planning and execution can go awry and so involvement of local community is very important. Some of the practices that can be popularized are enlisted below:

a. Contour farming: Contour farming is growing crops "on the level" across or perpendicular to a slope rather than up and down the slope. The rows running across the slope are designed to be as level as possible to facilitate tillage and planting operations on the contour. Cultivating along the slope will contribute to soil erosion and thereby soil degradation. Tribal farmers should be educated about the importance of contour farming.

b. Inter cropping: Intercropping is the companion planting method of growing one crop alongside another. The purpose behind intercropping is to increase yields by doubling up on available growing space. Intercropping creates biodiversity, which attracts a variety of beneficial and predatory insects that isn't possible with monoculture. Intercropping with one erosion-permitting crop with erosion-resisting crop should be recommended.

c. Mixed cropping: Mixed cropping, also known as polyculture, or co-cultivation, is a type of agriculture that involves planting two or more plants simultaneously in the same field, so that the crops grow together. Mixed cropping can be in alternate rows or broadcasted. Mixed cropping reduces the risk of failure of entire crop and sustain the income vulnerable families.

d. Multistoried farming: Multi-storied cropping is multi-layer cropping and multi-tire cropping. It is one kind of intercropping. Growing plants of different height in the same field at the same time is termed as multistoried cropping. It is mostly practiced in orchards and plantation crops for maximum use of solar energy.

e. Conservation Agriculture: Conservation agriculture would mean minimal disturbance to soil so as to ensure essential minerals within soil, stopping erosion and preventing water loss by various agronomical or other practices. It was earlier believed that tilling the soil would increase fertility within the soil through mineralization that takes place in the soil. But disturbance to crust leads to erosion and loss of fertility in sloped lands. **No-till farming** has caught on as a process that can save soil organic levels for a longer period and still allow the soil to be productive for longer periods (FAO 2007). Additionally, the process of tilling can increase time and labor for producing that crop. Minimum soil disturbance also reduces destruction of soil micro and macro-organism habitats that is common in conventional ploughing practices.

f. Institution Building: As already discussed, hand holding and institutional building for collective action by tribal communities is most important and suitable way for sustaining agricultural practices with reasonable productivity in tribal areas. The near absence of professionals willing to work in tribal areas is a major impediment in Institutional building. The capacity building of officials and workers of NGOs already working in such areas attains greater importance.

g. Transparency and Return on Investment: The expenditure involved in various initiatives in tribal areas including agricultural development will be generally high due to low level of population (Denominator) benefitted compared to high level of administrative expenditure (Numerator). However, in the absence of proper documentation and proper audit, there is a chance of diversion of funds or even allegation of misuse in case of genuine

expenditure. Hence there is need for evolving suitable participatory audit methods for benefits to flow in right direction and for positive outcomes rather than simple outputs.

11. Summary

The transformation of agriculture among tribals require variety of strategies depending on the resources available. The need for a comprehensive approach that ensures a holistic approach and strong intersectoral coordination is however necessary in any initiative. Increased yields are associated with some increased costs of production. However, the benefits of increased production can be accrued and rise in net income can be achieved through improved marketing and other strategies.

12. Recapitulation

- How can the agricultural practices by tribal communities be categorized?
- What are the unique characteristics of agriculture by tribal communities?
- How can community participation be achieved for promotion of agriculture in tribal areas?
- What is the approach adopted in the pilot project of NABARD for augmenting farm income in Balasore district, Odisha?

13. Key Terms

Sustainable agriculture Practices, Watershed Development, Community participation, Farmers Producer Organizations, NABARD

14. Activity

- Find out the problems of marketing of agricultural produce for tribal farmers in the area you are employed.
- Find out the opportunities and challenges for marketing of organic products cultivated by tribal farmers.

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2 Tribal Livelihood Promotion through Development of Allied Sectors to Agriculture

"Usually, the tribal community (in Srikakulam district of Andhra Pradesh) grows cash crops like cashew on hill top areas and food crops in the foothills. Selling their produce through market intermediaries reduces their returns drastically. These intermediaries offer credit facility at high interest and the tribal producers in return are bound to sell their produce only to them restricting their options of marketing".

"Having realized this, NABARD along with 2 local NGOs, has taken up the implementation of the "Maa Thota programme".

"Under this program, assistance is given to tribals to support horticulture with intercropping in 1 acre of land. The plantations of cashew and mango have come to fruition stage and NABARD wanted an agency to facilitate market linkages to ensure fair returns to the tribals. NABARD has commissioned the project to ALC India to promote producers' companies for 4000 Maa Thota farmers in this region. The objective of these Producers' Companies is to promote an integrated model of collective business with financial, technical and market linkages that will ensure economic empowerment of tribal farmers of Seethampeta mandal of Srikakulam District."

"It is expected that these Producers' Companies will enable value chain integration for the tribal producers. This is through provision of pre and post-harvest requirements which include infrastructure, trainings, markets, credit and input services."

Source: https://www.alcindia.org/case-studies/view/tribal-producer- companies.

- *What are the challenges you think we face in establishing vibrant producers cooperatives in tribal areas?*

Contents

1. Introduction

Lack of livelihood opportunities for tribal people is one of the chief causes of their backward status as compared with the other social groups. This issue is aggravated by the high rate of displacements faced by tribal people due to various industrial, hydro-electricity projects. The life of tribals is closely associated with forest. Therefore, their livelihoods also revolve around the forest and forest related products. Forest sector is the second largest land use after agriculture. In remote forest fringe villages about 300 million tribal and other local people depend on forest for their subsistence and livelihood and about 70% of India's rural population depends on fuel wood to meet its domestic energy needs. For about 100 million of them, forests are main source for livelihood and cash income from fuel wood, non-timber forest products (NTFP) or construction materials. More than half of India's 70 million tribal people, the most disadvantaged section of society, subsist from forests (P K Biswas, 2003). Of late many tribal communities have shifted to settled agriculture. However, majority of tribals own less than 1 ha of land. Consequently the families do need to depend on multiple livelihoods including agriculture, forestry, allied sectors to agriculture, employment on daily wages or monthly wage etc. It is attempted in this unit to inform the readers the opportunity to promote livelihoods in allied sectors to agriculture.

2. Learning Objectives

After going through the unit, the reader is expected to know:

(1) Opportunities for livelihood diversification in allied sectors to agriculture;

(2) The specific issues related to livelihoods for tribals in the identified sectors; and

(3) Government schemes available for Tribal Livelihoods.

3. Allied Sectors to Agriculture and Livelihood Opportunities

The allied sectors of agriculture can be broadly divided in to two classes: A. Land based activities; B. Non-Land based Activities. The different economic activities under these two categories can be further listed as under[1] :

1. Land based activities
   - Farm Mechanisation
     - Services
     - Repairs and Maintenance
   - Horticulture
     - Plantation crops
     - Vegetable Cultivation
     - Value Addition

[1] The list is not exhaustive and is location specific and can be expanded.

- Forestry
    - Commercial Forestry
    - Collection of NTFP
    - Value Addition
- Fishery
    - Capture Fishery in existing water bodies
    - Cage Culture in existing water bodies
    - Fish farming
    - Hatchery
    - Value Addition and Marketing
- Sericulture
    - Mulberry Cultivation and Rearing of cocoons
    - Spinning and reeling
    - Other cultures
- Muga/ Eri (endi)/ Tassar
- Wages in Land development

2. Non Land Based Activities
    - Animal Husbandry
        - Dairy
        - Calf Rearing
        - Poultry
        - Layers
        - Broilers
        - Backyard Poultry of improved varieties
        - Piggery
        - Sheep/Goat
        - Rabbit rearing
        - Other Birds (koel etc.)
    - Vermi Compost and Agri Inputs
    - Seed Processing
    - Apiculture including processing

4. The Specific Issues Related to Livelihoods for Tribals in Different Sectors

4.1. Farm Mechanisation

The majority of tribal farmers are small and marginal farmers with limited capability to invest in modern farm machinery synonymous with tractors, power tillers etc. Such equipment for a small and marginal farmer will also not be economical due to scales of operation. It is therefore necessary that we promote FM Hubs of big and small equipment and tools. The common equipment or combinations for this purpose are given below:

Farm Machinery hubs			Small equipment banks		
Tractor (upto 50 HP)	Power tillers	Rotovator	Ploughs	Bullock drawn equipment	Sprayers
Seed cum fertiliser drills	9 tine cultivators	levellers	Power Sprayers	Weeder (manual)	All kinds of hand tools
Transplanter	Threshers	Maize Sheller	Reapers	Maize sheller (pedal operated)	Threshers (pedal operated)
Power weeder	Post-harvest equipment for horticulture products		Peelers	Sorters and graders	
Reapers	Binders	Other equipment			

Such equipment banks can be viable livelihood option for a group of youth who can take them to farmers' fields and operate and earn rentals. The repairs to equipment and also bore wells/ water lifting devices etc. is another livelihood opportunity.

Rural Self Employment Training Institutes (RSETIs) are established in almost all districts in the country by Lead Banks with funds support from Ministry of Rural Development. NABARD also conducts courses for such entrepreneurs and State Governments across the country and provides subsidy for establishment of Farm Mechanisation Hubs / equipment Banks.

Central Institute of Agricultural Engineering (Bhopal) and Institutes like Central Farm Machinery Training & Testing Institute, Budni, Sehore (Madhya Pradesh), Northern Region Farm Machinery Training & Testing Institute, Hisar (Haryana), Southern Region Farm Machinery Training & Testing Institute, Garladinne, Anantapur (Andhra Pradesh), North Eastern Region Farm Machinery Training & Testing Institute, Biswanath Chariali, Sonitpur (Assam) and also Agricultural Engineering wings of Agriculture Department and State and Central Agriculture Universities provide further details of specific equipment.

4.2. Non-Timber based Forest Produce (NTFP)

The potential of NTFPs for poverty alleviation is very important. The rural poor and tribal communities collect various kinds of products throughout the year to sustain their livelihood. Activities related to NTFPs provide employment during slack periods in the

agricultural cycle and provide a buffer against risk and household emergencies. In fact sustainable NTFP management is key to the success of JFM.

The major issues in collecting and primary processing of NTFP are as under:

1. Forestry and horticulture based products can have limited shelf life and require drying and primary processing for increased shelf life and returns.
2. The products like sal patta, siali patta, tendu patta etc. are bulky in nature and require large storage space.
3. The price discovery mechanism is very poor in India for these products leading to exploitation by middle men.
4. Though efforts have been made by agencies like Regional Centre for Development Cooperation (RCDC) for collection of data about markets and prices, due to discontinued patronage, the web sites of such agencies are no more dynamic.

(also see http://www.banajata.org/)

5. The agencies like Girijan Cooperative Corporation and TRIFED are authorised to handle only a few products and as a result vast majority of NTFP gets sold in local markets.

The answer to all the above issues can be formation of Farmer's Producer Organisation of Tribals and help them in value addition, price discovery and marketing. Many such FPOs have been created already and a live case can be seen in Navodaya FPO formed with guidance from Dr Amar Naik of XIMB, Bhubaneswar and NABARD Chair Professor. (*https://navjyoti.wordpress.com/2009/11/).*

4.3. Horticulture

Women FPCs in Jaypur Range of Bankura (North) Division, West Bengal

In a study of 3 FPCs, namely Tribanka, Gopal Nagar, and Brindaban Pur in Jaypur range of Bankura (North) division, West Bengal, it was found that NTFPs contribute significantly to the economy of the rural poor. In these villagers, FPCs were formed between 1990 and 1991. With proper protection by the villager, the *Sal* forest was regenerated to a great extent and other products like mushroom and medicinal plants contributed to the income of the VFCs. During 1992-93, each of the VFC earned about Rs. 1.0 lakh by selling *Sal* leaf products only. According to the Range Officer of Jaypur, his beat had the potential to produce 30 quintals of mushroom in a single week, with proper dehydration technology. Apart from these, the villagers were collecting *mahua, satmuli* and 29 varieties of medicinal plants both for self-consumption and sale.

Source: Biswas, P.K, 1994.

Horticulture is traditionally more successful in tribal areas due to less demand for water, and better tending by tribals. The idea of horticulture in tribal areas is very old and soil conservation departments of states like Goa, Andhra Pradesh, Odisha, West Bengal etc. have been providing mainly cashew seedlings close to the catchment areas of major river valley projects. However, the asset is seen as a public good and individual's role was limited to harvesting the fruits. The systematic effort for promoting horticulture as a

livelihood activity involving groups of tribals and utilisation of available wastelands was done under Tribal Development Fund of NABARD. The same is described below.

4.4. Tribal Livelihoods through Tree Based Cropping System

The "Wadi" model of tribal development is holistic in approach addressing production, processing and marketing of the tribal produce and also other needs. The core of the programme is "Wadi", and other development interventions are built around "Wadi". The "Wadi"' in Gujarati means a 'small orchard' covering one or two acres.

Wadi- The beginning

Comprehensive Tribal Development Programme commonly known as **"Wadi"** programme, introduced during 1980s in Vansda, Gujarat by an NGO, BAIF, Pune, has left a visible impact in a short span of time and stands out as a demonstrative and sustainable model, suitable for replication in other tribal areas of the country. The programme was mainstreamed by NABARD through their flagship programme under Tribal Development Fund.

The project design involves choosing at least two horticulture species (mango or cashew or amla or any fruit crop suitable to the area or a combination of these horticulture crops), with forestry species on the periphery of the land holdings. Two or more tree crops are selected in the "Wadi" model to minimize the climatic, biological and marketing risks. Tribal families having less than 5 acre land are allowed to take up wadi in 1 acre each for raising around 60- 80 fruit plants suitable to local area and 600 forestry plants on the boundary.

Other development interventions in the areas of environment, soil conservation in the wadis, water resource development, agriculture development, women development, health etc., are woven around the wadi.

Water resources development: Even though the programme area receives an annual rainfall of 2,500 mm, because of steep slopes and rocky terrain, water retention is poor resulting in severe soil erosion and nutrient loss. As the existing water resources are not sufficient to irrigate 'Wadi' plots, run off water is harvested through construction of temporary check bunds across river streams and development of perennial springs. The spring water is used for drinking as well as for irrigation purposes. Pot drip irrigation is provided to the fruit plants in the initial 3 years of plantation as protective irrigation.

Soil conservation measures: Bunding, tree plantations, and also a combination of these two and trench-cum-bund based on field level requirements have been introduced from the first year. The participants are paid for the soil conservation and plantation work done by them in their fields.

Processing and Marketing: The programme has been designed to ensure value addition, assured market and remunerative prices for the wadi related produce. Decentralised processing facilities for cashew and mango are established under the cooperative fold at two levels viz., village and cooperative (central) levels. This has facilitated creation of employment opportunities for landless tribal families in the project area and also ensured appropriate price for the farm produce, by providing captive market for the raw material

and better returns through value addition. Wadi programme also has components of Health and Women Development concentrating on community health programme (focuses on mother and child health care (MCH) as well as primary and preventive health care and drudgery reduction along with awareness generation about reproductive health and development aspects).

The community based programme is anchored by Village Ayojana Samitis of Village Wadi Committee (People's Organisations) under the able support of a Non-Government Organisation or Project Implementing Agency. The implementation strategy followed was as follows:

Tribal families having less than 5 acres of land, willing to stay in the village and willing to contribute family labour for the orchard development and also those who are free from bad habits like drinking etc., are selected for coverage under the programme. The wadi programme lays emphasis on people's participation throughout the implementation process. The establishment of village level people's organisations called Village Ayojana Samitis (VAS) has been the strongest grass root level institution for planning and implementing the programme. The VAS is a village level committee comprising of representatives elected from amongst the wadi participants for planning and executing the programme.

The New Model of Wadi

The conventional model of wadi, based on cultivation of perennial fruit crops starts generating the income from fourth year onwards. The new "WADI" model combines the mandap system of vegetable cultivation along with perennial fruit crops. The mandap occupies 0.25 acres in one acre plot, while 0.75 acre is used for wadi plantation. The mandap system supports two types of vegetables- creeper vegetable grown along the bamboo support and GI canopy of mandap and crops like turmeric and ginger that are grown in the shade of the mandap. This arrangement has enabled the generation of income to the tune of Rs 35,000 to Rs 45,000 from the first year onwards.

The core Wadi and other components are supported with grant assistance. A unique feature of the funding mechanism is blending of grant with credit not only to ensure participants' stake and involvement in the programme, but also for self -reliance of the participants. As the programme progresses with "Wadi" establishment and income generating activities, loan assistance is given to the tribal participants to support income generating activities, micro enterprises, water resources development and other emergent needs under Alternative Credit Delivery System in far flung unbanked areas. This innovative credit programme is being implemented through NGO, peoples' organisations and SHGs. The cumulative sanction under the Fund as on 31 March 2017 was Rs.2030 crore and disbursement was Rs. 1340 crore, covering 5.03 lakh tribal families in 673 projects across 27 States/UTs.

The model is now being adopted by many state governments for replication by using their funds and also some of the corporates like TATA Trust are joining hands with State Governments and NABARD with their CSR funds.

Programme Achievements

- The programme has been recognized by national and international agencies for the change it has brought about in the lives of tribal families.
- Arresting migration and soil and water erosion are the major benefits derived so far.
- The availability of protective irrigation through water resources development has increased cropping intensity.
- A shift in cropping pattern towards commercial crops such as vegetables and pulses has resulted in generating regular income.
- The production of vermi-compost and NADEP compost and emphasis on bio-pesticides in the programme has opened up avenues for production of organically grown produce.
- The production of cashew and mango has opened up avenues for processing activities.
- There is a substantial rise in employment opportunities for landless in procuring and marketing of farm produce, processing of cashew and mango as well as other income generating activities in non-farm sector.
- Initiation of informal credit delivery system (credit through VAS and SHGs) has increased access of tribals to credit for income generation activities. It has inculcated saving and repayment habits.

4.5. Fishery

The fishery sector can be broadly divided into two sub sectors namely: a. Capture fishery; b. Culture fishery (including hatcheries).

4.5.1. Capture Fishery

Capture Fishery refers to fishing in existing ponds, natural water bodies, reservoirs etc. Tribals close to big irrigation projects or close to rivers are known to fish. But it is mainly for self-consumption and not for commercial sale. However, the activity provides much needed nutritional base for tribal families by having better meal plate composition.

The tribals need to be provided boats, nets and other accessories for better capture. They are required to be educated about the importance of conservation while capturing fish. In Odisha, Government has identified Malkangiri District (a district with large tribal population) for promoting capture fishery in existing reservoirs.

4.5.2. Culture Fishery including Hatcheries

Improvement on capture fishery is cage culture in exiting reservoirs where fish are grown in cages placed inside reservoirs. This reduces need for digging new ponds. Cage is an enclosed space to rear organisms in water that maintains free exchange of water with the surrounding water body. The cages are generally enclosed on all sides, except for leaving an opening at the top for feeding and handling the stock. They can be positioned at the

bottom, middle or surface of the water column, but floating cages are very popular and easy to manage. Cages are of many shapes (round, square or rectangular). The guidelines for cage culture in open water bodies in India are issued by NFDB and same can be accessed at following link.

http://nfdb.gov.in/PDF/GUIDELINES/Guidelines%20for%20Cage% 20Culture% 20in% 20Inl and%20Open%20Water%20Bodies%20of%20India.pdf.

As per guidelines the reservoirs that are to be selected are as under:

1. Cage culture shall be allowed in water bodies having a surface area 1,000 ha or more at Full Reservoir Level (FRL).
2. Cage culture shall be allowed in reservoirs with an average depth of 10 m.
3. The cage site at the reservoir should have at least 10 m depth round the year.

The smaller lakes and ponds are excluded as the lack of required depth means heavy loss of fish and also possible environmental impacts due to feed management. The cage culture involves less expenditure than commercial fish farming.

The fish farming by utilising or creation of new fish ponds can be more costly than cage culture. Central Institute of Fresh Water Aquaculture (CIFA), Bhubaneswar has demonstrated one such successful project involving tribal families of Adivasipura in West Bengal which was devastated by cyclones and their livelihoods were seriously threatened. Composite fish culture of Indian major carps like rohu, catla and mrigal was promoted at a ratio of 4:3:3 and total stocking was 6000 per ha. The technologies like regular feeding, manuring, pellet feed lime and SSP application was done.

Beneficiaries could earn an income of about ₹ 4.56 lakh per ha by harvesting about 4.3–4.9 tonne of fish hectare per year. The benchmark production for the area was as low as 800 kg hectare per year. In order to encourage higher productivity Fish cum Duck culture was also introduced by construction of low cost duck houses and 800 ducklings of "Khaki Campbell" variety. Through duck-cum-fish culture 38 farm families received a total profit of Rs 2.8 lakh per year from 3 hectare pond water area.

Similarly tribal fish farmers comprise 40% of all fish farmers in Tripura. Fisheries and aquaculture are considered as important economic activities for income generation, gainful employment and to ensure nutritional security of rural masses in Tripura (Das, 2012). During the last decade, Tripura made the most significant growth in fish production among all north- eastern states (Debnath, 2011).

Such initiatives require trained technical personnel to assist the tribal farmers in the initial years. The marketing of fish generally is not a big challenge as there is always a local demand but value addition is mostly limited to drying of fish. The major backward linkage for culture fishery is seed materials like fingerlings /yearlings etc. Promotion of hatcheries not only provides local employment to youth but also help in accessing fingerlings and yearlings at doorstep.

4.6. Apiculture

Bee Keeping is an activity which is very close to natural vegetation like forest. It requires regular flowering so that honey bee can produce honey throughout the year. Honey collection from the wild is very common activity among tribals but the process of harvesting is not sustainable. *Apis mellifera ligustica* is the *Italian bee,* a subspecies of the western

honey bee is reared in wooden boxes. This is commonly called apiculture and is recommended as a livelihood activity. In this, bees are maintained in boxes and they are reared for production honey.

Each rearing box having 10 plates will yield 40 kg of honey in a year. If a farmer owns 100 units, it will yield 40 q of honey. The farm gate price the farmers receive is Rs 100 per kg. Therefore, income of farmers per year from honey is Rs 4 lakh.

The problem of low production during summer may not arise because flowering plants will be available in forest throughout the year. Tribal families need to organise themselves for aggregation, processing and organise marketing of honey and honey based products.

4.7. Animal Husbandry

Livestock keeping generates a continuous stream of income and employment, makes it an inevitable component of tribal development. Enhancing the knowledge of tribal livestock owners would be the first step towards attaining a higher-level adoption of the recommended livestock management practices. Knowledge is a pre-requisite to the proper utilization of improved livestock management practices by the tribal livestock owners and is ultimately linked with the increased economic returns from dairying. A very large number of tribal farmers especially in Maharashtra and Jharkhand are adopting indigenous animal husbandry practices in treating a wide range of livestock health disorders. These practices are found to be not only economical but also quite sustainable and use locally available resources.

There is a taboo among some of the tribal groups not to rear animals for milk but it is changing rapidly. Dairy activity is very much in demand in the areas. Availability of fodder in the forest areas makes this activity sustainable. Instead of pure exotic variety, cross bred cows should be encouraged which can withstand disease and pest to a greater extent.

Knowledge about various livestock management practices is the pre-requisite for acceptance and adoption of modern technology. Tribal livestock owners can adopt new technology if they have knowledge about it. So, exposure to and use of appropriate information by poor livestock owners will help them to improve knowledge enabling them to obtain more output from their livestock.

A project implemented by an NGO (Mitra Association for Social Service – MASS) in Palamaner area of Chittoor district of Andhra Pradesh throws some light on the benefits of imparting knowledge among tribal communities before grounding milch animal units. The NGO during the initial phase of implementation of Tribal Development project *(supported by NABARD)* in Jayanthi village had noticed that the beneficiaries were not tending to the plants, as there was no income and were migrating again to nearby areas in search of labour. To improve their incomes and increase the survival rates of the plantations under the project, the NGO had come out with a proposal to support these beneficiaries with milch animals. The agency tied up with the local branch of Sapthagiri Grameen Bank for loan and local ST Corporation provided 50% subsidy on the activities. All the beneficiaries in Jayanthi village were supported through this initiative and it dramatically improved the survival of plantations and stopped migration as well as increasing the incomes of tribal farmers. Each beneficiary was given with two dairy animals along with other support like biogas units, vermicomposting unit, fodder cultivation and veterinary support.

The same approach (see the above box) was followed by the agency when they expanded to other villages in the district with support from NABARD (under its UPNRM & TDF projects). Among the animal husbandry activities, milch cows are popular with the size varying from 1-7 cows. The income per animal per month was in the range of Rs 4000/- which had a tremendous impact on strengthening the family incomes as well as contributing to overall success of the project. These incomes are far more regular (payment every 15 days) and helped in arresting migration, strengthening the plantations through replacement of plants at own cost, digging bore wells and creating other infrastructure including construction of houses, purchase of TV, mobile, two wheeler, Gold, etc. Apart from dairy, tribal farmers were raising sheep and goat and the size ranged from 2-30 sheep/goats. These activities complimented the core plantation activity and that is the main reason for the success of the program in a drought hit area.

The initiatives of HARSHA TRUST in Odisha and PRADAN in Jharkhand and other states are also examples of success of poultry sector in tribal development. Rural women, many of them belonging to tribal communities were encouraged to take up small layer poultry farms of 300-1000 birds. The funds for the initiative were either grants from NABRAD/State Government or loans from banks. Capacity building, chicks, feed, veterinary care including medicine etc., are taken care by the community organisations promoted by the NGO and the final produce is also being collected by the federation for marketing. A sustainable livelihood is shown to tribal communities without any risk from input or output front.

Taking the above example, the Maharashtra Government had approved a project named 'Swayam' that is aimed at encouraging poultry farming in the tribal areas of the state of Maharashtra. Through the project, the government plans to eradicate malnutrition among children in the tribal sub plan areas, as poultry farming will raise the availability of eggs, which would be included in the meals of anganwadi children. The project would also generate self-employment opportunities for the tribals. The 'Swayam' project will be implemented in 16 districts - Thane, Palghar and Raigad (Konkan division), Pune (Pune division), Nashik, Ahmednagar, Nandurbar, Jalgaon, Dhule (Nashik), Amravati and Yavatmal (Amravati division), Nagpur, Gadchiroli, Gondia, Chandrapur (Nagpur), Nanded (Latur division). About 43,368 families will benefit from the scheme. The estimated cost of the project is Rs 22.55 crore and it would be implemented in the years- 2017-18 and 2018-19.

4.7.1. Setting Poultry Units

More than 70% of the poultry population available with the tribal communities belongs to desi variety, which have low productivity. Further, the constraints relating to availability of land for construction of large scale poultry as well as the high cost of Day old chick, feed etc., is also hampering the growth of poultry among the tribal communities. There were also efforts to introduce the improved desi varieties like Vanaraja and Gramapriya. Performance of improved birds like Vanaraja has already been evaluated in the region under NATP on household food and nutritional security through improved poultry. The project implemented in the states of South Indian and North East Indian States has already indicated the superiority of Vanaraja over indigenous birds of the region. Data recorded on hatchability (55.2%), body weight at 6 th / 18 th weeks of age (0.74 / 2.4 kg) and mortality up to 6 th weeks (12.7%) indicated the adoptability of the birds in the region. The

acceptability of Vanaraja among the tribal people is found to be high, as these birds have a triple advantage in terms of colour and hardiness like local bird, high egg laying capacity (160-180 eggs/year) and higher weight gain, than the local birds. It has better resistance against common poultry diseases and is adaptable to the free range rearing with minimum supplementation of locally available feed ingredients.

With improved desi varieties like Vanaraja, INDBRO Brown Layers etc., gaining acceptance among the people, it would be ideal if we can promote such improved breeds with a commercial approach. The idea is to produce DoCs locally, rear them for a month and supply to farmers. Farmer's collectives can be the medium for implementing the approach. The details are as follows:

a. Setting up of Custom Hatching Units:

The cost of DoC in hilly tracts dominated by tribals is about ₹ 60/- which is on the high side. The high cost is due to import of chicks from poultry states and the capacity of government farms being limited. It would be ideal if we can set up a breeding unit with necessary hatching facilities. However, the cost for setting up of such units is on the very high side *(the cost for setting a breeding farm would be at ₹ 1600 to ₹ 2000 per bird).* Alternatively, the farmers collectives can tie up with colored bird breeders *(M/s INDBRO of Hyderabad; M/S Devi Poultry of Hyderabad; Project Directorate on Poultry, Hyderabad which pioneered the vanaraja/gramapriya breeds etc.,)*, source the hatching eggs from them and hatch at the identified places in their areas itself. This requires setting up of a custom hatching unit to produce quality chicks and based on the capacity, it may cost around ₹ 5-6 lakh for the setter (30,000 eggs) & hatcher (10,000 eggs). With other infrastructure like generator etc., a small custom hatching unit to produce 10,000 chicks per week can be set up with an investment of ₹ 10 lakh in a rented premises. The fertile eggs of good dual purpose colored breeds with about 85-90% hatchability are being sold at ₹ 26 per egg (for example - landing price at Guwahati). The fertile egg rates of vanaraja / gramapriya are being sold at ₹ 10-15/egg by Directorate of Poultry Research, ICAR, Hyderabad. The hatching cost would be at ₹ 2.5 to ₹ 3 per egg. In effect, by having a custom hatching unit, the day old chick cost can be brought down to around ₹ 30-35/- from the current market price of ₹ 60 per DoC.

b. Rearing Units

DoCs are more susceptible for weather shocks and diseases during the first month of their life. Hence, it would be ideal, if the DOCs are reared by the farmers collective for a month, harden them and then supply to farmers for backyard rearing. Farmers collectives can identify progressive members to set up rearing sheds and the economics would be as follows:

Capital Cost (1000 bird unit):	
i. Cost of constructing rearing shed (0.6 sq.ft/bird; ₹ 250/sq.ft)	₹ 1,50,000
ii. Cost of feeders, waterers, water tank etc.,	₹ 20,000
Recurring Cost: (per batch of 1000 birds)	
i. Cost of DoCs (1050 no – 5% extra; ₹ 35/DoC)	₹ 36,750
ii. Cost of Feed (1 kg/bird; ₹ 30/kg)	₹ 30,000
iii. Cost of medicine and labour (₹ 15/bird)	₹ 15,000
iv. Miscellaneous cost (electricity, water etc.)	₹ 10,000
Total Cost	₹ 2,61,750

About ₹ 3 lakh may be required for a farmer to market the first batch. The cost for raising one batch of 1000 chicks up to 4 weeks of age would be at ₹ 0.91 lakh and the return by sale would be at ₹ 1.2 lakh, by assuming that 4 week old chick will be sold at ₹ 120 each (body weight around 450 g for Vanaraja) [2].

c. Distribution to farmers

One month old vanaraja or gramapriya can be sold to farmers and the ideal size can be anywhere above 30 birds considering the topo of the state. Some of the farmers can be encouraged to start semi intensive units with about 250-300 birds capacity. The economics can be worked out based on the capacity, on the above lines.

d. Collection of Produce &Support services

Farmers' collectives can procure the eggs and finished birds from the farmers, which will help in better realization of prices at member level. A three wheeler or an Ace Vehicle (TATA) at the disposal of Farmers' collectives can serve the purpose. It can deliver the feed at the doorstep of the big farmers (300 capacity and above) and at the same time collect the eggs / finished birds from them. The collective can market the eggs / finished birds in the smaller towns. Other support services include providing quality feed, veterinary support etc., Feed can be prepared manually through use of the locally available ingredients, grind them through a small grinder (1 HP Grinder can cost around ₹ 15,000) and hand mix them initially. Major ingredients like Maize is grown in plenty and can be utilized for making poultry feed. Later on they can think of setting up of a small feed mixing unit. A 1 ton per hour mixing unit may cost around ₹ 3 lakh. The farmer's collectives can also think of training one of their interested member in poultry farming for taking care of vaccinations and other services.

4.7.2. Setting up of Dairy

Similar is the case with dairy animals and the need to introduce hardy varieties of improved desi cattle. The cross breeds of Jersey and HF may not be highly suited for the tribal communities residing in the hilly tracts in various parts of the country compared to the plain area tribals. Apart from the introduction of animals, provisions relating to milk collection, feed and fodder supply, doorstep veterinary services etc., also play an important role in sustaining the activity.

The dairy programme under the Vanbandhu Kalyan Yojna, the Gujarat government's tribal welfare initiative, strives to pull tribal farmers from poverty by providing them cattle and support – like training, collection centres, bulk chillers, milk testers, artificial inseminators, stainless steel containers and somatic cell counters (to check for infection). This is a seven- year project to convert 78,000 tribal families to dairying at a cost of '700 crore to be jointly shared by the state government, partner dairies and the tribals themselves. Four animals make the business viable. To cap subsidies, the government provides a household with two each at discounted rates and cheap bank loans. It expects breeding to bring in the rest.

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[2] Costs and economics are based on the secondary data sourced from different agencies and may vary based on the actual situation.

4.7.3. Rearing of goats and pigs

In addition to dairy, tribal families are rearing goats, pigs and backyard poultry. Goats are most popular activity among tribals. It is said that goats require some amount of free grazing land for quality meat. The variety of goat like Black Bengal is very popular along the forest fringes in eastern India. Other varieties of goats are Jamunapari, Jafarabadi, etc.

The indigenous variety of pigs like *Ghungroo* can be a highly profitable activity for tribals. Ghungroo an indigenous strain of pig is popular because of high prolificacy and ability to sustain in low input system. This breed/strain produces high quality pork utilizing agricultural by-products and kitchen wastes. Ghungroo are mostly black coloured with typical Bull dog face appearance, with a litter size of 6-12 piglets, individually weigh about 1.0 kg at birth and 7.0 – 10.0 kg at weaning. (http://www.icar.org.in/node/8078).

4.8. Farm Forestry and Nurseries

Farm forestry for raising commercial plantations has emerged as one of the major livelihood opportunity in some specific locations where forest based industries are located. As per Forest Policy-1988, the industry is required to involve local community and raise plantations in private lands. In many locations (Koraput district in Odisha, Khammam in Telangana), thousands of hectares of land is brought under forestry species and the same has also created employment for harvesting and transport of same to mill premises. The sector requires honing of skills of local labourers in nursery raising, plantation, vehicle loaders and drivers etc.

> Harsha Trust has formed Patnewari Farmers Producer Company of Tribals in Koraput District involving about 3500 farmers and has taken up cultivation in an area of more than 5500 acre. The FPC is making a profit of more than ₹ 3 cr and is successfully running since last ten years.

4.9. Sericulture

Sericulture has got good potential for livelihoods among tribals. The silk varieties like Muga, tussar, eri which are host specific are produced in plants like som, arjun, castor etc. Arjun plant is hardy and popular in the degraded land as a soil conservation measure. These plants can be used as host plant for production of tussar. India is the second largest producer of Tussar silk and the exclusive producer of Indian Tussar (also known as tropical tussar), which is largely tended to by tribals. Similarly Muga silk which feed on som (Machilus bombycina) and sualu (Litsaea polyantha) leaves is very popular in Assam and north eastern states and gives good employment to the tribal population. The activities of sericulture like, cultivation of host pant, rearing of silk cocoon, reeling, weaving provides employment opportunities and supplementary income to the tribal families.

5. Success of livelihoods diversification: Infrastructure required

Any development process needs to be supported by providing infrastructure facility in the area. The infrastructure support can be for Connectivity, Communication, Common service Centre, and Marketing facility which directly improves the livelihoods. In addition, other supports like, education, vocational training, health, drinking water, child care are also required to build the human capital in the area. The infrastructure required for livelihoods in tribal areas is explained as under:

5.1. Road Connectivity

Physical connectivity in the form of roads and bridges are prime for development of any area. When roads and bridges are developed, transportation for goods and services becomes easy. This will, not only facilitate services like school, health care in the backward area but also can bring markets close to tribals.

5.2. Common Service Centre

Livelihood is more sustainable if it is taken up in a cluster and it is more pronounced in tribal areas. The backward and forward linkages require Common Service Centre (CSC) so that a few activities can be done centrally. This will allow the capital intensive machinery to be installed in the CSC and thereby products will be cost effective.

5.3. Packaging and Branding of Products

In the era of market economy, the products need to be presented to capture the niche market. Tribal products which are novelty items require innovation in packaging. Branding is also required so that the products can be sold through e-commerce. Online portal exclusively for tribal bazaar can be created and can reach across globally. This requires lots of effort in connecting all tribal across India for which a dedicated team is to be put in place.

5.4. Marketing linkages

The products developed in the tribal areas need a linkage to capture the urban market. Therefore, an organised market with display and storage facility is required in semi urban areas. Tribal Bazaar to be developed so that tribals can directly come and sell without any mediators across all cities. Tribal art and craft are most valuable today, especially in interior decoration of homes and offices. Giving a modern touch and providing world market through online shopping may provide great livelihood to tribal.

6. Summary

Lack of livelihood opportunities for tribal people is one of the chief causes of their backward status as compared with the other social groups. The life of tribal is closely associated with forest. Therefore, their livelihoods also revolve around the forest and forest related products. As per the NSSO 2013 survey, 92.88% of the tribal land holding is less than 2 ha. Livelihoods among tribals can be of two types, viz, livelihoods in their area of habitation and outside the tribal dominated area. Agriculture is the main occupation and source of livelihood among tribals. Other livelihoods inter alia include wage and employment, Non-Timber Based Forest Produce and collection of fuel woods. The potential activities as occupations are horticulture, farm forestry and nursery, apiculture, animal husbandry based activity, mining, handicraft based activities etc.

Sustaining the livelihoods in the fragile zones require robust infrastructure in the form of road, bridges, telecommunication, market linkages, common service centre, packaging and branding. It is possible to encourage livelihood diversification among tribals in the sector of allied activity of agriculture and availing the different schemes of Central

and State governments like Schedule Tribe Development and Finance Corporation, LAMPS, National Rural Livelihoods Mission (NRLM) etc.

7. Recapitulation

- What are the opportunities for livelihood diversification in tribal areas?
- What are the successful models available for promotion of horticulture in tribal areas?
- What are the ways for promotion of fishery in tribal areas?
- How do you think poultry and dairy can be promoted in tribal areas?
- What infrastructure would be required for sustaining the livelihood diversification in tribal areas?

8. Key Terms

Livelihoods, Development, NABARD, NGOs, marketing

9. Activity

- Find out the opinion of tribals towards poultry units for livelihoods diversification.
- Find out if any initiative was made in a tribal area you are familiar with for promotion of sericulture. If yes, ascertain the reasons for its failure or success.
- Conduct a PRA for understanding the preferences of tribals in regard to livelihood diversification.

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3 Afforestation

"Study on more than 2000 compensatory afforestation plantations across the country found that in 70% of the projects plantations have been taken up on notified forest land but termed as "degraded" in official records. Case studies documented by authors of the study reveal in many cases plantations have been raised in dense native forests defeating the very purpose of afforestation".

In 43 of 56 instances (information is not available for 7) community forest resource rights under forest rights act had been claimed but recognised only in 22 cases. "There is evidence to suggest that in several villages, FRA claims are kept pending or are outrightly rejected in anticipation of compensatory afforestation plantations".

"In 53 of 63 case studies no consent was taken from gram sabhas for plantation. "The forest department shows a strong preference for monoculture, commercial, exotic and invasive species that demand excessive resources and harm the surrounding biodiversity. Data from 2548 plantations clearly show about 60% of the plantations are of commercial species, with teak and eucalyptus together comprising more than 25% of trees planted," the report adds".

Source : https://timesofindia.indiatimes.com/home/environment/70- afforestation-projects-taken-up-in-forests-local-body-consent- ignored-study/articleshow/63354107.cms (12-4-2018; 10.46 a.m)

- *Do you think the claims made in this study are appropriate?*
- *Do you think afforestation projects by the forest department are affecting the tribal livelihoods?*

Contents

1. Introduction

Destruction of forests is a great concern internationally. Ministry of Environment and Forests, Government of India (2006) declared that 350-400 million of our population is forest dependent. The depletion of forests is of special concern in our country. However, the forests in India too, as they survive today, have a very uneven and unbalanced spatial distribution; large areas in different parts of the country are bereft of any vegetation. The growing pressure of population - both human and cattle - has accelerated the process of deforestation. According to National Forest Commission Report, 2006, 41% of the total forest in India is already degraded, 70% of the forests have no natural regeneration, 55% of the forests are prone to fire. World Bank in 2011 reported that 23.07% of land area in India is under forest cover compared to 33% forest cover in USA. The decreased forest cover and its consequences are realized by the government and the non-governmental organizations in the country and the corrective measures are advocated. Afforestation is one such corrective measure.

Forests are home to many tribal communities in India. Tribal people have been safeguarding forests through their cultural ways. They have developed intimate knowledge about the flora and fauna due to their living in the midst of forests. It is appropriate not only to encourage afforestation in tribal area, but also take cognizance of their knowledge and practices in this regard. This unit will focus on the different aspects relating to afforestation.

2. Learning Objectives

After going through this unit the reader is expected to:

(1) Understand the concept of afforestation and types of afforestation

(2) Comprehend the advantages of afforestation

(3) Critically evaluate discrepancies involved in afforestation initiatives

(4) Acknowledge some governmental afforestation initiatives

3. Why Trees and Forests?

Trees are probably the most selfless beings on the face of the earth. Throughout their lifetime, they provide and cater to the needs of other beings compared to what they consume. They provide us with oxygen which is the most important component for survival. Roots of trees help in retaining underground water and thus regulate the water table. They help the soil to retain its fertility and work against erosion. Fruits and vegetables which form a staple part of our diet are a by-product of photosynthetic activity of plants. Trees act as natural screens against ultra-violet rays present in sunlight. They regulate temperature and indicate the change of seasons. Nowadays, many alternative medical therapies of the mind and body (both ancient and modern) involve trees and their produce. Forests, which are home to thousands of trees, form the earth's second largest ecosystems. Many animals, birds and insects are sheltered under the green cover of the forests. Forests are also home to many indigenous communities of the human kind all over the world.

4. India and Forests

Forests in India were always central to the evolution of her civilization. Forest-based ashrams (settlements) produced the best scientific research and cultural writings, and India became known as an Aranya Samskriti, or a forest culture. Human understanding of the fundamental ecological utility of forest ecosystems and their economic importance led to trees being treated with respect and veneration. This basic dependence on the existence of forests for human survival was the reason for the worship of trees in almost all human societies. Forests in India have three major economic roles. In order of their significance to the economic development of Indian society, they may be classified as follows: 1) to regulate, through the humus in the forest soil, the supply of water for the nation's water reserves, and to build and conserve soil; 2) to satisfy basic domestic biomass needs of food, fodder, fuel, fertilizer, fiber and small timber for three- fourths of the population; 3) to satisfy industrial and commercial demands. The first contribution of forests to the national economy is to defend against floods, droughts and soil erosion. The second contribution is to the sustenance of about three-fourths of the population that depends on the free productivity of nature for the satisfaction of basic biomass needs. The third and last contribution is mainly to the growth of wood-based industries that must obviously have a priority lower than that of the survival and sustenance of the people.

5. Deforestation

Deforestation refers to cutting, clearing and removal of forests or forest land in order to make it available for other uses such as construction, industrialization etc. It is the indiscriminate destruction of trees and forest land which results in permanent damage to the forest ecosystem. Deforestation occurs around the world, though a major chunk of forest cover that is lost every year is that of tropical rainforests. This over-exploitation occurs mainly for the following reasons:

- To clear forest land in order to make it available for construction of both residential and commercial establishments and also extensive farming.
- To obtain timber that can be used to produce paper, furniture and for other commercial uses. Apart from these man-made causes of deforestation, the ones that occur naturally are over- grazing and large forest fires. Burning forest land is one of the most common causes of deforestation along with cutting or felling large swaths of forest lands. 'Jhum' or 'Podu' cultivation as it is popularly called in India refers to the slash and burn method of cultivation in which small tracts of forest land are burnt in order to make the land weed-free and available for sowing. This process goes on again in the next sowing season thus leading to destruction of tropical forests, prevalent across South Asia. Deforestation occurring through both natural and man-made processes leads to loss of habitat disrupting the balance in the ecosystem. It leads to increase in the amounts of green-house gases in the atmosphere further leading to global warming. Water cycle goes unregulated due to fewer trees and there is also reduction in soil fertility as it is more prone to erosion. To overcome these harmful effects of deforestation and to increase tree cover, afforestation activities are being taken up by governments as well as non- profit organizations. Let us understand afforestation as a concept and as an initiative in a detailed manner.

6. Afforestation: Meaning and definitions

Afforestation refers to the plantation scheme for the new forest on the earth. Afforestation is the act of planting trees in barren lands in order to generate a forest. It is the process of planting trees in a land that was previously not a forest. Plantations are made in huge tracts of unused lands to increase green cover. Thus, indiscriminate cutting of forests is regulated with commercial needs such as timber being taken care of by these specific plantations. However, one must not equate afforestation with reforestation. While the latter means reviving or trying to increase tree cover in an existing forest, the former is an activity in which a new forest is created. Afforestation can therefore be defined as "the establishment of a forest or stand in an area where the preceding vegetation or land use was not forest" (Helms, 1998). Afforestation has also been defined as "the human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding or the human-induced promotion of natural seed sources" (Bredemeier and Dohrenbusch).The International Panel on Climate Change (IPCC) Guidelines defines afforestation as the "planting of new forests on lands which, historically, have not contained forests."

7. Afforestation Initiatives

Depending on assessment of soil in the particular area and also the native floral and faunal species afforestation activities are designed accordingly. Some of the types of these initiatives are as follows:

7.1. Agro-Forestry

This is the practice of planting trees along crop-lands and pasture lands in order to re-grow trees. This process is done after careful evaluation of crops sown so that there is no counter interaction with the species of trees that will be planted around or between the crops-lands. This way, there is symbiotic interaction between the plant species resulting in nitrogen fixation and thereby higher yields. Agro-forest systems have been proven to possess higher biodiversity and better soil fertility. These systems have also helped in contributing to greater food security, addressing domestic firewood needs and to an extent limiting the use of harmful insecticides and pesticides. Medicinal plants are also grown in order to support traditional medicine. Agro-forestry methods are used in various ways depending on the crop pattern of the agricultural fields. These include hill-side systems, canopy systems, physical support systems and strip cropping systems. This practice has been prevalent in many parts of North and North-East India.

7.2. Social Forestry

Social Forestry refers to the mechanism of afforestation of barren lands with a simultaneous aim of aiding social and rural development. The Government of India has taken up the Social Forestry Scheme in 1976 with the aim of planting trees on unused and fallow lands close to settlement areas and along villages in order to increase tree cover with the involvement and support of the common man. Plantation activities are carried out along highways, railway lines, river banks, village fallow lands and other lands under the government's control such as Panchayat land. The initial years of implementation and

plantation were monitored by the government and the responsibility was later transferred to the Panchayats.

Social forestry, an approach that was designed to correct one-dimensional forestry, uses a combination of diverse multi-purpose tree species. Since trees have to be physiologically and ecologically matched to diverse end-uses, a uniform monoculture indifferent to ecological requirements and basic needs cannot, even in theory, be a forestry model for the social objectives of conservation. However, some social forestry projects have ignored this principle. For example, under the World Bank-funded social forestry programs, the state forest department of Karnataka intended to carry out 60 percent of afforestation on privately owned farmlands with eucalyptus as the dominant species. Social forestry has also unfortunately become counter- productive in some cases because it has diverted fertile agricultural land from food production to wood production, while degraded land in need of afforestation continues to be further degraded.

7.3. Community Forestry

Community forestry is the act of plantation of trees in the common land owned and managed by a particular community or village and the benefit of the produce is exclusively shared only among the community members. The saplings or seeds are provided by the government or an NGO to the community members who will ensure the growth and management of the forest. Usually, fruit trees or trees with minor commercial importance such as eucalyptus are chosen so that the community members can benefit from consuming or selling the produce. Domestic timber needs of the community can also be taken care of. In many cases, village institutions apart from the Panchayat are also set up in order to manage these forests and ensure non-exploitation of the produce or land by one or certain groups of individuals.

8. Government Schemes of Afforestation and Some Institutional Arrangements

8.1 National Afforestation Programme (NAP)

In view of the growing demand for wood and to meet the deficiency, government initiated scheme titled National Afforestation Programme (NAP) has been formulated by merger of four 9th Plan centrally sponsored afforestation schemes of the Ministry of Environment & Forests, namely, Integrated Afforestation and Eco-Development Projects Scheme (IAEPS), Area Oriented Fuel wood and Fodder Projects Scheme (AOFFPS),Conservation and Development of Non-Timber Forest Produce including Medicinal Plants Scheme (NTFP) and Association of Scheduled Tribes and Rural Poor in Regeneration of Degraded Forests (ASTRP), with a view to reducing multiplicity of schemes with similar objectives, ensuring uniformity in funding pattern and implementation mechanism, avoiding delays in availability of funds to the field level and institutionalizing peoples participation in project formulation and its implementation. The Scheme is operated by the National Afforestation and Eco-Development Board, Ministry of Environment and Forests as a 100% Central Sector/ Centrally Sponsored Scheme.

The Scheme is implemented in a participatory manner using a two-tiered set up namely the Forest Development Agencies (FDA) and Joint Forest Management Committees

(JFMCs). The forest department in a state is administratively divided into territorial circles, each headed by a Conservator of forests. These are further divided into territorial and wildlife divisions. Forest divisions form the basic unit of forest administration and management.

The institutions of FDAs and JFMCs are highly innovative resource transfer mechanisms whereby the Government of India channelizes funds directly to the grass root level implementing agency for the afforestation activities. The structure of FDAs and JFMCs also caters to the gender concerns, whereby women membership to the extent of 50% has been made mandatory in these bodies. Members of Schedule Castes and Schedule Tribes are the focus group in JFMCs. Training of FDA and JFMC members is organized by State Forest Departments, as well as by the Regional Centres of National Afforestation and Eco-development Board. To help and guide the FDAs and JFMCs, there is also a National-level Steering Committee of NAP and another at State level called State-level Coordination committee chaired respectively by Secretary (Environment and Forests), Government of India, and Chief Secretary of the State Government.

8.2 Compensatory Afforestation

The Ministry of Environment, Forest and Climate Change (MoEFCC) envisaged the implementation of compensatory afforestation fund management and planning mechanism through allocation of land for maintaining the forest cover balance and also the local ecology due to forest clearances leading to the diversion of forest land for non-forestry purposes for national developmental imperatives. Due to certain discrepancies in the implementation of compensatory afforestation, some NGOs had approached the Hon'ble Supreme Court for relief. The Hon'ble Supreme Court on 10th July 2009 issued orders that there should be a Compensatory Afforestation Fund Management and Planning Authority (CAMPA) National Advisory Council under the chairmanship of the Union Minister of Environment, Forest and Climate Change for monitoring, technical assistance and evaluation of compensatory afforestation and other activities as per the FCA 1980 Guidelines [2]. National Compensatory Afforestation Fund Management and Planning Authority (CAMPA) have been established towards better governance with following mandate or objectives:

- Lay down broad guidelines for state CAMPA.
- Facilitate scientific, technological and other assistance that may be required by state CAMPA.
- Make recommendations to state CAMPA based on review of their plans and programmes.
- Provide a mechanism to state CAMPA to resolve issues of an inter-state or Centre state character.

9. National Mission for a Green India

To increase forest and tree cover in the country, the Central Government has initiated National Mission for a Green India as a Centrally Sponsored Scheme for total cost of Rs.13,000 crores in February, 2014 and taking appropriate measures to put in place a

proper institutional mechanism for expeditious utilization of amounts released in lieu of forest land diverted for non-forest purpose. The National Mission for a Green India aims at following:

- Enhancing quality of forest cover and improving ecosystem services from 4.9 million hectares (mha) of predominantly forest lands, including 1.5 mha of moderately dense forest cover, 3 mha of open forest cover, 0.4 mha of degraded grass lands.
- Eco-restoration/afforestation to increase forest cover and eco system services from 1.8 m ha forest/non forest lands, including scrub lands, shifting cultivation areas, abandoned mining areas, ravine lands, mangroves and sea-buckthorn areas. Enhancing tree cover in 0.2 mha Urban and Peri-Urban areas (including institutional lands) Increasing forest cover and eco-system services from Agro-forestry and Social Forestry on 3 mha of non-forest lands.

10. Uses of Afforestation Schemes

Forests are home to terrestrial ecosystems and a thriving opportunity for increased levels of bio- diversity. Afforestation provides carbon sinks to help fix the pollution in atmosphere and thereby significantly alter climate change and global warming. Plants help in locking soil moisture and help control the erosion of top soil. Further, afforestation aids water filtration, flood control and the prevention of sediment transport. Afforestation is the only way to meet the ever-increasing demand for timber so that further damage to natural forests is halted. There are not only ecological benefits but also socio-economic gains of afforestation:

- Promotion of self-governing local institutions that manage forests.
- Awareness about the importance of conservation of forests.
- Increased people's participation and pronounced role in decision-making.
- Share of the produce such as timber, fruits, nuts etc.

11. Monitoring Indicators to Measure the Success of Afforestation Projects

Most forestry projects are designed and implemented with an aim of reducing environmental degradation and through afforestation to improve ecological balance. Construction of nurseries, providing samples for plantation and encouraging local participation are some of the activities undertaken by any agency involved in forestry projects. Certain monitoring indicators are set in order to measure the success of afforestation projects. These can be briefly discussed as:

1. Rehabilitation of forest: This includes the status of tree cover, top height of trees, canopy cover etc.
2. Changes in species composition: The interaction between naturally present species and selection of appropriate species for the habitat over time.
3. Status of biodiversity: Increased biodiversity is an indicator of a good forest and the steps taken to conserve it.

4. Change in socio-economic status of the people: This includes changes in employment, migration, income levels, status of women, social cohesion, availability of market for forest produce etc.
5. Protection against forest fires and illicit felling of trees
6. Proper functioning of Joint Forest Management Committees – these are management bodies that are an offshoot of partnership between the State Forest department and the local people. In Andhra Pradesh, they are known as Vana Samrakshana Samithi (VSS). Proper monitoring of JFMC's requires ensuring proper representation of local people, ensuring women's participation (not just nominally), and proper account maintenance, proper system of meetings, decision making and implementation of ideas from time to time (Gupta 2013).

12. Notable NGO contribution to successful afforestation projects

12.1. "Commons" Story – Intervention of FES

Foundation for Ecological Security (FES) is a registered non-profit organization, headquartered at Anand in Gujarat, working towards ecological restoration in the country. The organization has actively restored common "wastelands" of the adjoining Papagni river basin in the districts of Chittoor and Anantapur which is essentially a drought prone area with heavy agricultural distress. With the active presence of VSS and Tree Grower's Mutually Aided Cooperative Societies in the region and the support of the government FES has succeeded in afforestation of 50,000 hectares of common wasteland in Chittoor and Anantapur. For this purpose, 1.2 lakh samples of eleven different species that were selected in conjunction with local members were planted in the region. 36,000 seedlings of forest tree species and about 30,000 agave suckers were planted on 89 hectares common lands, and 20,023 seedlings of indigenous tree species were planted on 58 hectares farmlands. Rural volunteers were capacitated to support village institutions in protecting and managing common lands. A group of 50 para-workers were also trained in soil and water conservation measures, to help the watershed development committees in the preparation of micro-plans.

The demand for firewood, by hoteliers, schools and local households, has increased pressure on common lands. To tackle this issue, energy conservation measures were initiated. Besides construction of biogas plants, the installation of *bhattis* (improved commercial scale stoves), helped halve local firewood consumption. Since the intervention of FES in 1991, there has been overall improvement in tree cover at 8.24 % of the total land.

(Source: FES annual report 2011-12 and fieldwork in May 2013)

13. Joint Forest Management Committees: Some Select Success Stories

13.1 Earning Credit through Environmental Conservation

Chedwai (JFMC), of Kaghaznagar in Telangana gained appreciation for environmental leadership on 1st December, 2004, by selling carbon credits to the World Bank. A cheque of

Rs 24,000 and a certificate for environmental leadership was handed to the President of the JFMC. The same village was earlier notorious for smuggling of valuable teak wood from government forest to hill plain areas. The JFMC was formed in 1996, and now the same communities have become forest protectors and tree growers. They planted Kanuga (*Pongamiapinnata*) plants, through which oil is extracted, and used as a bio-fuel. This gave a boost to the village livelihood. Also, an equivalent of 200 tonnes of Carbon Dioxide as an emission was purchased by the World Bank from Chedwai under Clean Development Mechanism under the Kyoto Protocol.

13.2. Multi-faceted Impact of JFMC, Kerala

Elapeedika JFMC of Kerela has been facilitating the State Tribal Development Department in the construction of houses for the tribals in the village along with assisting the Kerela State Literacy Mission Authority in conducting adult education classes in the JFMC area. It also organizes adventure trekking through Nehru Yuva Kendras which are affiliated to the Women Development Corporation which organizes training programmes for women. Furthermore, the JFMC also undertakes nursery work of supplying seedlings of Casuarina, Bamboo, and Acacia Auriculiformis to the contract farmers of Hindustan Newsprints Ltd. It also facilitates assistance in the form of micro-insurance to the members through the United India Insurance Co Ltd, which covers medical and life insurance. The JFMC also takes up agro-farming through its members for the Khadi Village and Industries Board.

14. Afforestation: Where Caution is Required?

As beneficial it may be, improper management of afforestation can bear devastating effects on the ecosystems. It can lead to loss in biodiversity, modification of particular biomes, introduction of counter-productive species of flora and fauna and lesser water flow. There should be "critical examination of the conditions and circumstances in which practical improvements of BD can be achieved, and also when new plantations should be rejected because they interfere with sensible systems and communities, which should be conserved. In particular, monoculture forest plantations established and maintained with "quasi-industrial" management methods often carry high specific risk potential with respect to their stability, and may in many cases result in impaired BD(read biodiversity)" (Bredemeier and Dohrenbusch). This has been particularly true of the savannah grasslands which are in potential danger from this kind of mismanagement.

Some community forestry level issues also stand as a barrier to affective afforestation. Exploitation of communal lands by influential few, increasing in-migration, free-riding, lack of motivation to work for common resources as benefits may seem too long-term, insufficient expertise or capital required for both afforestation and conservation and vested interests of funding or implementing agencies. Most of the times, authoritarian regimes do not work in such cases as it is a community based decision-making approach.

15. Afforestation in Tribal Areas: Opportunities and Strategy

The afforestation initiatives in tribal areas need to be linked to tribal livelihoods. Since majority of the tribals look for supplementing their incomes through collection and sale

of non-timber forest produce, the plantation of such trees in the afforestation schemes that give them opportunity to increase their collection of non-timber products is very desirable. There is need for a clear bias towards NFTP species rather than to timber species. Further, there is need for research in this regard to give high yielding varieties and species that quickly mature and give the yield in a lesser time. In such cases, the involvement of tribals can be more easily achieved.

In many afforestation activities in tribal area, non-tribals are engaged for various works. Instead of this, tribals can be preferred, even if it required some training. Their involvement will give them the feelings of 'ownership' rather than the feeling of just a 'user'.

The ROFR Act 2006 has come into effect in 2006. Amendments were made to this act on 12-7- 2012 and 23-7-2012 and these amendments came into effect from 6-9-2012. Importantly, under this act, individuals and communities can claim a maximum of 4 acres and less than one hectare, respectively for individual use and community use. The community lands under ROFR act can be taken up for afforestation. This will be an opportunity to integrate the schemes of afforestation and economic development of tribals. The community participation in these activities is likely to be achieved in such integration.

16. Summary

Afforestation is the process of planting trees in hitherto unused lands in order to facilitate the growth of a forest. Agro-forestry, social forestry and community forestry are the types of afforestation initiatives. A number of afforestation programmes are being taken up by the government such as NAP, compensatory afforestation, National Mission for Green India etc. Afforestation, while increasing tree cover, also provides carbon sinks to fix atmospheric pollution and in locking top soil against erosion. Afforestation is the only alternative to meet every day timber demands. Some socio-economic gains of afforestation programmes are the promotion of local self-governing bodies and strengthening people's participation. The success of an initiative can be measured by employing certain monitoring indicators such as rehabilitation status of forest, changes in species composition, status of biodiversity, changes in socio-economic status of local people and proper functioning of Joint Forest Management Committees. However, the caution must be taken to ensure the use of endemic species in afforestation initiatives to prevent devastating effects on ecosystems.

17. Recapitulation

- What is deforestation and afforestation?
- What is the difference between afforestation and reforestation?
- How to distinguish Agro-forestry, social forestry and community forestry?
- What are the major Governmental interventions?
- How afforestation schemes are beneficial?
- What are the monitoring indicators to measure the success of afforestation projects?

18. Activity

Conduct a Participatory -Rural Appraisal of a tribal village to know about the natural resources, flora and fauna of the region. Undertake mapping of the area for afforestation activity.

19. Key Terms

Afforestation, Agro-forestry, Biodiversity, Community Forestry, Compensatory Afforestation Deforestation, Ecosystem, Social Forestry.

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4 Marketing of Agricultural Produce and Non Timber Forest Products : Challenges and Opportunities for Tribals

Celebrating Mahua and livelihoods: How to reap benefits from Indian forests

"The Mahua economy: This survival tree has economic, cultural and geographical importance and dominates farm economy, as it is an important source of livelihoods to forest dwellers".

"In fact, realising its cultural and economic importance, forest departments of Maharashtra, Bihar and other state governments have ventured/explored into making jams, squashes, biscuits and jellies from these flowers, according to reports, thus taking the traditional tribal delicacies to the next level with good commercial scope. TRIFED mentions a tamarind Mahua candy and pickle that is being explored as well. Additionally, private organisations such as one, 'Unexplored Bastar' in Chhattisgarh boasts of a nutritious Mahua 'laddoo'. Such initiatives aim at livelihood diversification while curbing menace from illegal consumption of local drinks made with flowers. What's more, it also helps tribal economies flourish economically and builds rich cultural capital of indigenous communities dependent on modest forest wealth".

Source: Swasti Pachauri , The Indian Express; April 14, 2018
http://indianexpress.com/article/lifestyle/life-style/celebrating- mahua-and-livelihoods-how-to-reap-benefits-from-the-indian- forests-5136292/

- *How do you think the effective marketing of tribal products is possible in today's highly competitive market scenario?*
- *Don't you think inscription of market value on the traditional produce would deprive of the cultural value of the tribes?*

Contents

1. Introduction

The prehistoric humans were hunter-gatherers. In the process of civilisation they started growing their own food using local materials and tools by practicing shifting cultivation. They have later adopted sedentary agriculture. They were self-dependent and self-supporting with a subsistence economy. Each village tended to develop a localised culture and selective isolation with its own identity. In due course of time globalisation has played the main role in erasing the boundaries of the villages and increased urbanisation. Globalisation and urbanisation have differentiated between food producers and consumers which created specialisation in former and latter classes of people. Agricultural class specialised in increasing the output and exchanged surplus with consumers for manufacturing goods and services in a market. A market is a place where sellers and buyers are gathered for exchanging their goods and services (Negi 2012).

Tribals adopted agriculture both for livelihood and for a status on par with non-tribal communities. However, the agricultural yields of tribals is affected by small land holdings, illiteracy, unemployment, high incidence of land alienation, poor access to institutional credit, lower levels of investment, lack of proper agricultural information, absence of effective market environment for effective price discovery and lack of extension system (Purushottam and Mishra; Jalaja and Kala 2015). Predominance in mono-cropping and rain-fed agriculture is not sufficient for their sustainable development. They had to depend on alternative sources of income like animal husbandry, non-agricultural activities and non-timber forest products (NTFPs) (Gupta *et al* 2015).

Tribals are used to sell their agricultural produce and NTFPs in local *shandies.* They do not have access to market facilities to get a fair price. The intermediaries or middlemen who are non- tribals play the main role in buying goods at very low exploitative prices and sell them to retailers for high profits. Effective marketing strategies are required to tackle exploitation. Tribal farmers can sell their products profitably, if only, the facilitators for marketing such as communication, transportation, storage facilities and financing arrangements are available. It is evident that agricultural or horticultural production and their marketing must develop hand in hand (Negi 2012). This unit focuses on the challenges faced in the marketing of agricultural produce and non-agricultural goods or NTFPs and also the government efforts to address to the needs of marketing of tribal produce.

2. Learning Objectives

After going through the content of the unit, the reader is expected to learn:

(1) What is marketing and why it is important in the lives of tribals to uplift themselves?

(2) The challenges faced by tribals directly and indirectly in marketing agricultural produce and NTFPs.

(3) What is GCC and its role in uplifting tribals, in facilitating markets and marketing activities?

(4) The role of GCC organisation and challenges faced in helping tribals.

(5) How can the betterment be brought in implementing marketing strategies?

3. Marketing and its Genesis

Earlier all humans were the part of subsistence economies. They used to produce their own food, prepare own materials and build houses on their own until communities started interacting with their closest spheres. Globalisation has also played a crucial role in bringing communities of various people together. The development has occurred in terms of urbanisation and specialisation. Increased population and starvation for development to uplift living standards led people to practice their specialised activities. Food producers got differentiated from manufacturers and service providers. Agriculturalists increased their capacity of output in producing commercial crops, they not only fulfilled their requirements but also exchanged surplus for the non-agricultural needs with non-food producers. The concept of the market was developed to exchange goods and services for profit. The traditional markets were weekly *shandies* where goods will be exchanged once a week. The marketers promoted the goods for selling, store goods until the competitive price is realised and tap information for the fair prices. The whole process that evolved is known as marketing. Several researchers have defined marketing as referring to the creation and distribution of the goods to the end users.

Actually, marketing is the basis of rapid socio-economic and commercial changes as marketing starts with production and ends with customer's satisfaction, including production, packaging, channels of selling, transportation etc. Nowadays, a seller needs to know and understand marketing in addition to his/her duties and rights. Marketing is interpreted in different ways among various sections of people. To the consumer, marketing may refer to the supermarket. The farmers deal primarily with local farm product buyers and may associate marketing with the calling of local elevators to determine which is offering the highest price. In contrast, middlemen such as retailers, wholesalers, and processors may view marketing as a process for gaining a competitive advantage over market rivals, improving sales and profits, and satisfy consumers. Each group has only a partial concept of the marketing process. Marketing is essential in the present scenario as it consists of an interdependent chain which is tied with producers, middlemen or consumers who are different and are concerned with own profits. From the producers' point of view, it is imperative to know whether the price is influenced by the Government policies or by the marketing situation. In this regard, producers have to concentrate on the assumption what to be produced and where to be produced and how much time is required to spend for its production. From the point of view of middlemen, large-scale production requires skill to sell the produce at a suitable price. Middlemen fulfill these requirements of selling manufacturers' products to the end-users. Without middle-men, the companies and manufacturers cannot bear the burden of promotion and selling of products, and thus appoint agents, borders, selling agents etc., so that the products are conveniently reached to the ultimate users. Consumers understand the process marketing in view of goods and the prices at which they are offered. It is obvious that consumers always prefer the goods that are better in quality and less in price. Marketing conditions are changing in India due to changes in government policies, trades, farmers, specialised advisors etc., (Negi 2012).

4. Tribal Marketing

Tribals live in remote and isolated scattered spheres, which are their characteristic as well as the cause of backwardness. This remoteness manifests itself in various ways, such as

remote from social agencies, educational institutions, business activities and information supply sources. It is this remoteness which is a reason for the absence of proper market facilities. The tribals sell their agricultural and/or horticultural goods as well as NTFPs in the weekly *shandies*. The *shandies* are thus the oldest places of promotion (a marketing activity) to sell the surplus agricultural produce and NTFPs of tribals. The marketing was not aggressive but used to start in the *shandy*; prices of the goods are decided and varied on the same day. In some villages, tribals rely on village heads and fellow farmers for the price information of the produce. Since the markets are situated in farther places from the area of production tribals have to incur huge transportation costs. If the storage facilities are absent in the market, the tribals are left with only option to sell off all the goods on the same day for two reasons; a) Goods brought to market mostly perishable which cannot be stored more than two-three days, b) No proper infrastructure and high transportation costs than the profit earned. These reasons make tribals to lose fair price by selling goods to the middlemen or local traders at low cost.

GCC of Andhra Pradesh helps tribals in eliminating middlemen in the procurement and introducing good marketing practice. Currently, there are two types of marketing channels adopted by tribals of Andhra Pradesh. (Gamparai 2012). These channels are as depicted below:

1. **Local Channel**: Tribal seller ⇨ *Shandies* ⇨ Village Merchants ⇨ Local wholesalers ⇨ Retailers ⇨ Consumers

2. **GCC Channel:** Tribal seller ⇨ GCC Procurement branch ⇨ GCC head office ⇨ GCC outlets ⇨ Consumers

5. Tribals and Agricultural Produce

Many Tribal communities with very low variation in sources of earning depend on agricultural produce. Due to the government support to agriculture, in terms of supply of quality seeds, distribution fertilisers, provision of credit facilities and assured price for the crop, tribals too are inclined to increase their agricultural activity. The produce is understood in two major classes of crops in terms of economic outturn as commercial and other crops. The crops which are exclusively produced-agricultural or horticultural crops - for the purpose of earning to the producers or farmers are called commercial crops or cash crops. There is increased demand for crops of the geographical backlog or tribal regions due to the feature of qualitative genetic crops and organic varieties.

6. Challenges in Marketing of Agricultural Produce

Good market facilities in a region depend on the increased agricultural yield as well as the sources available to bring the produce to the market. Tribals show interest in selling the hefty produce in main markets but not small amounts. They prefer to sell small amounts in the local *shandies*. Here we see the factors responsible for lower agricultural output and how these are affecting the marketing of agricultural produce.

- ***Lack of Proper extension services***

Andhra Pradesh government has designed the schemes for soil testing, distribution of soil cards, the supply of farm equipment for the benefit of tribals. Soil testing gives information about the fertility of the soil and suitable crops to produce in it with a better output and enhance returns by selling in the market. Either tribals are not aware of the schemes or the schemes are not effectively implemented. It is one of the reasons for low yield of the produce than expected. Purushotham and Mishra in their field enquiry found that paddy being the main cash crop in the Paderu region has yielded 450 kgs per acre whereas the expected yield was 645 kgs per acre.

- ***Crucial role of money lender-cum-trader***

The institutional credit availability for tribals is less due to the small land holdings and title- less lands. Purushotham and Mishra mention that there are tribal villages in Paderu region in Visakhapatnam agency, which are not enumerated in forest surveys that led to title-less lands. There are many households who are not able to access institutional credit for not possessing proper land titles. Tribals depend on informal credit system i.e, local money lenders who also play a role of local traders/commission agents. Tribals accept loans at very high interest rates from money lenders in spite of knowing that they are exploited. The factors responsible to depend on the local traders are a) high transportation costs and lack of storage facilities, and b) malfunctioning of the formal procurement system. The *shandies* are unreachable for several farmers. These conditions often lead to distress sale of much tribal produce, particularly perishable goods such as fruits (pineapple, jackfruit etc). Once the farmer brings the produce to the *shandies,* he/she is left with only option to sell off all the goods at whatever price they get. This is because of the absence of storage mechanism of produce in the market and there is no sense in taking goods back home to incur additional losses.

Money lenders-cum-traders play a crucial role in exploiting the tribals by imposing high interests as well as by not paying the competitive price for the produce. Local money lenders-cum- trades are easily available for the credit as they maintain rapport with tribals by going door to door to buy produce. The produce is weighed and stored at the farmer's house. The local trader schedules to pick the produce at the doorstep whenever the optimum amount is bought. Tribals do not want to incur transportation costs by traveling long distances to sell small amounts of produce. This is the main reason for tribals preferring local traders over GCC (a formal procurement body). Also, the payment is instant from the local traders whereas needs to adhere the set procedures in case of GCC. Tribals never realise the competitive price of the produce as they hardly get chance to compare by visiting a distant market. Local traders employ myriad tactics to keep away the potential competitors. Here we can conclude that tribal farmers are unable to implement even the basic marketing activities.

In the Paderu region, tribals are more concerned about false weighing practices than high interest rates. The practice is common with local traders. In this region, terms of the loans are 24-60% or the commitment to sell the produce to the local trader (Purushotham and Mishra). The Bhil tribes in Madhya Pradesh agree to sell the produce to money lenders at a pre-decided price even before crop harvest, instead of paying high interests. This is how Bhils secure themselves from the market risk but they will lose fair returns if the price of the commodity increases (Harish 2017).

- ***Agriculture and market information***

In an agricultural environment, relevant and timely information helps farmers to take the right decision to the sustained growth of agricultural activities. Use of right information in agriculture enhances farming productivity in a number of ways. Providing information on weather trends, best practice in farming and timely access to market information helps farmers make correct decisions about what crops to plant and where to sell their products. The developments in society depend largely on the availability and access to accurate and reliable information.

There are several sources of information like government officials, public rural libraries, print media, television, radio, community leaders and fellow farmers. The communication between government officials and tribals is not that effective. Negative attitude of government officials and a perception that tribals lack interest and the language barriers are few reasons which are hindering the communication. High illiteracy is another reason to be away from the sources of print media and rural library. They prefer to tap information from community leaders and fellow farmers about farming practices and market prices. The indigenous methods are advanced in their context but not as effective as modern agriculture (Jalaja and Kala 2015). The village heads and elected representatives of Bhil tribe in Dhar district, Madhya Pradesh are the beneficiaries of firsthand information from government about schemes of financial assistance, supply of modern equipment, new crop varieties etc., The hunger for achieving superior status and constraint of limited number of beneficiaries made village heads and elected representatives to restrict the flow of information to fellow farmers. They prefer to reap the benefits themselves first. Thus, many farmers are unaware of schemes regarding agricultural information and market activities (Harish 2017)

- ***Poor logistics***

Low level of infrastructure development and logistic-linkage of tribals with mainstream society and high information gaps are responsible for their limited access to inputs, technology and extension services, government schemes, and efficient marketing arrangements. In Paderu region, for want of transport facilities, about 40 percent of the fruits such as pineapple and jack- fruit never reach markets. Members will visit towns in an emergency or acute need. The tribal areas being remote, the government staff who are expected to provide basic services including technical guidance usually bypass these areas. There is a regular tendency to avoid postings to the agency areas. Tribal areas are vulnerable to such governance deficit. For instance, the high mortality rate among livestock is attributed to the absence of veterinary doctors.. Similarly, tribal households in some areas could not take up coffee plantations due to lack of extension services from horticulture officials. Households prefer to sell their output to traders at a lower price because of the high transportation costs to outside markets (Purushotham and Mishra).

7. Tribals and Non Timber Forest Products (NTFPs)

According to Food and Agriculture Organisation of United Nations (FAO), NTFPs are all goods for commercial, industrial or subsistence use derived from forest and their biomass (Gupta *et al* 2015). Man after satisfying basic needs of food, shelter and clothing started depending on NTFPs with the growing needs due to the advancement of civilisation. So,

NTFPs have attracted considerable global interest in the recent years. Developing countries are the major producers of NTFPs whereas developed, industrialised countries are the largest importers.

A major share of minor forest products especially fruits, resins, fungi, wild honey, medicines, sandalwood, bamboo and rattan originates from the forests of Southeast Asia (Gamparai 2012).

For many tribal communities in India, agriculture has emerged as main source of earning. However, mono-cropping because of poor irrigation facilities and fewer returns from the land, made these tribal communities to adopt NTFPs collection as a secondary source of income. Gamparai (2012) mentions that 53% of tribals in India live in rural areas; among them 31% directly depend on the collection of NTFPs for their livelihood. About 70% of NTFPs collection in India takes place in the central tribal belt of the country in six states; Maharashtra, Andhra Pradesh, Telangana, Madhya Pradesh, Bihar, and Odisha. The Middlemen used to exercise the monopoly on the NTFPs and pay low collection prices for tribals. To maintain livelihood security of the rural population and to remove exploitation, Government of India has nationalised trade of few NTFPs in the 1960s and 1970s to get assured minimum prices. Girijan Co-operative Corporation of Andhra Pradesh has taken initiative to provide market facilities for nationalised NTFPs and check exploitation. The advent of Joint Forest Management (JFM) by United Andhra Pradesh government has brought a significant change in forest management from practices favouring revenue generation for profit maximisation to one focusing on meeting local people's subsistence needs for food, fodder, fuel wood, and NTFPs.

8. Challenges in Marketing of NTFPs

The government of India has taken measures for the free flow of NTFPs to the market. The government societies give assured price but will not procure at the doorstep. The nationalisation of NTFPs has not benefited the tribals. The difficulty in availability of market and unawareness of marketing activities among tribals are the reasons for inefficient and unprofitable trade. The following are few challenges faced while marketing the NTFPs:

- ***Nationalisation of NTFPs***

The government of India and State governments have nationalised few NTFPs. The remaining other NTFPs were left free for trade because their distribution and production varied with respect to time and space. As a result, tribals would get low collection prices and often are exploited by middlemen for the non-nationalised NTFPs. (Gupta *et al* 2015). The list of nationalised NTFPs has not been revised for long; there are produces where the dependence of tribals is more and revenue generation is high.

Nationalisation affected the tribal communities rather than increasing the bargaining power of the poor. It has reduced the free flow of goods; the buyers have adopted other illegal modes of trade. The delay in payments to tribals by the government has increased the intermediaries and contractors who operated on higher margin to cover uncertain and delayed payments and to pay police and other authorities to ignore their illegal activities. In spite of the establishment of GCC, the local agents continue to play a dominant role in the trade by acting as a link between collectors and GCC (Gamparai 2012).

- ***Remote markets and inadequate market facility***

Tribals are the victims of improper market facilities and remote market areas. Perishable nature of NTFPs and low amounts of collection compel tribals to sell the goods in weekly *shandies*. The easy access to middlemen allows tribals not to take the risk by visiting remote markets and hence undergo exploitation. Tribals never realise the fair prices of the commodities and receive very less from middlemen for their NFTP.

- ***Infrastructure and transportation facilities***

Tribals mostly dwell in hilly isolated spheres and forests which lack connectivity of roads amongst their villages. Least road transport and less number of vehicles choke the trade between villages and keep away government procurement agencies. Markets lack proper storage facilities too; the available storage space in the market floated by GCC in Visakhapatnam region is not fully used by farmers (Gamparai 2012). Tribals' unsold commodities cannot be stored and fair prices can never be realised.

- ***Improper collection and storage***

Tribals employ unskilled techniques to collect NTFPs. They lack the knowledge of using machinery and end up gathering less. They use fire to burn the floor of forest for the regeneration of tendu leaves and collection of mahua flowers or sal seeds. The repeated use of fire degrades the quality and quantity of tendu leaves. Drying and proper storage of mahua flowers requires considerable skill. The quality of improperly stored flowers deteriorates rapidly. Due to their inability to store flowers properly, many collectors sell their produce immediately, though if they are able to hold on to their stock for a few months, they can get a much better price in the off-season period. Sal seeds production is famous for non usage of pesticides and fertilisers which is its unique selling point, but the storage of kernels in contaminated bags of fertilisers and usage of pesticides to protect from infections degrades the quality (Saigal 2008). The NTFPs with less quality lose market value. The GCC, Visakhapatnam has been taking up various training programs for the NTFP collectors in scientific gum tapping and in processing honey.

- ***Lack of Value addition services***

Since ages tribals know only to sell the raw NTFPs for income; they are unaware of later stages of processing and marketing. Societies which procure NTFPs have complaints against tribals for supplying unprocessed commodities. Tribals receive lower prices for raw goods because societies have to employ additional labour for processing. There is a lot of market potential for value added NTFPs. The NTFP supply chains are unduly long and primary collectors get only a fraction of the price paid by the end-consumers. For example, collectors in Andhra Pradesh get only about 10% of the price paid by end-consumers in major cities. The current product base is narrow and there is a need to look for various alternative uses of NTFPs to improve collectors' returns and reduce future uncertainty. There is vast untapped potential for value addition of NTFPs like mahua and tamarind. Mahua not only used for brewing country liquor but also for value added products such as candies, squashes, pickles, and vinegar. Tamarind can be processed into powder, granules, concentrate, blocks, and drinks, it is usually sold in the raw form by the primary collectors. There is great potential to enhance the income of the collectors and producers by setting

up tamarind- based enterprises in the areas of production. There has been some effort by GCC in this regard but much more needs to be done (Saigal 2008).

- ***Over regulation: Reduction in trade and enterprise development***

There is over-regulation in the case of several NTFPs, especially those that are commercially important. One of the biggest bottlenecks for the development of NTFP-based enterprises is the requirement of transit permit for many products. For example, in Orissa there is a limit on the amount of mahua flowers that can be stored or transported. In Madhya Pradesh, all farmers growing bamboo in natural bamboo districts have to register themselves with the FD and also inform it at the time of felling. A permit is required each time the produce is transported and each permit is valid for only a few days. Sanction of permit takes up to 30 days. Although a number of steps have been taken by different state governments in recent years to reduce bureaucratic hurdles, a lot more needs to be done (Saigal 2008).

- ***Other factors***

Tribals have difficulty in understanding the forest regulations about which areas are permitted and prohibited for gathering NTFPs. Some reports pointed out that forest department exploits gatherers by imposing fake penalties in cash or a part of produce for collecting in an accessible area. The National Forest Policy (1988) clearly states that the local communities' subsistence needs have a much higher priority than commercial-industrial production on forest lands. Although it has been nearly two decades since the issuance of the policy statement, the commercial-industrial focus continues in the case of many NTFPs (Saigal 2008).

Tribals frequently get injured by wild animals when they go for collecting NTFPs in deep forests. No proper protection measures are provided or taken by forest department or government. Deforestation is another cause of decreased amounts of collecting NTFPs. The trees are chopped off either in practicing shifting cultivation or in smuggling timber (Gupta *et al* 2015). Lack of sources of marketing information is a major drawback. Television, radio and print media give information about the production techniques but not so much on marketing information (Jalaja and Kala 2015).

9. Tribal Cooperative Marketing Development Federation Of India Limited (TRIFED)

TRIFED (Tribal Cooperative Marketing Development Federation of India Limited) is a national level apex organisation which was established in 1987. It works under the administrative control of ministry of Tribal Affairs. TRIFED has a connection to its member Federations and consisting 13 offices all over India with its headquarters in New Delhi. Tribes mostly depend on Minor Forest Products like Honey, Gum, Karaya, and Mahuwa Flower etc., in order to sell their products TRIFED acts as a link between them i.e consumers and the tribes. TRIFED aims to improve the livelihood of the tribal communities by creating a sustainable market and create business opportunities for them based on their cultured knowledge and traditional skills whilst ensuring fair and equitable remuneration. It involves exploring marketing possibilities for marketing of tribal products on a sustainable basis,

creating brand and providing other services. The main role of this TRIFED is to protect tribal people from being exploited through the private middle agents.

TRIFED has a network of 13 regional offices across the country and it mainly identifies the products and sells through retail marketing network of TRIBES INDIA outlets. It has been undertaking sourcing of various handlooms, artifacts, food products and naturals through its empanelled suppliers across the country and this suppliers consists of individual tribal artisans, tribal agencies, tribal SHGs, organisations/NGOs working with tribals.

10. Invigorating the Girijan Co-Operative Corporation (GCC): The response of Andhra Pradesh to the challenges of marketing of NFTPs and agricultural produce by tribals[1]

In the year 1955, in order to uplift the Scheduled tribes economically and check exploitation by plainsmen, the Government of Andhra Pradesh established "Andhra Scheduled Tribes Finance & Development Corporation Ltd." In the year 1970, its name was changed to the Girijan Co-operative Corporation Limited (GCC).

10.1 Aims and Objectives

1. To procure NTFPs collected by the tribals, pay them remunerative prices and thereby eliminating the middlemen and private traders who are into unfair trade practices.
2. To supply essential goods and other Daily Requirements (DR) at reasonable prices to the tribal consumers through the network of DR depots.
3. To help in getting short-term credit to the tribal farmers for their seasonal agricultural operations.
4. To undertake activities such as processing and grading (it is a method of dividing products into certain groups or lots in accordance with predetermined standards) for the benefit of the corporation and its affiliated societies and their members and for this purpose to own or hire necessary plants and machinery
5. To undertake activities for the welfare of the Scheduled Tribes and for the attainment of the above objectives.

10.2 Functions of GCC

GCC is the state-owned corporation; functioning with an orientation to become a direct point of contact with the tribals. Girijan Primary Co-operative Marketing Societies (GPCMS) fills the gap by acting as agents to GCC and have easy access to tribal markets. The membership in GPCMS is restricted to local tribal people. GPCMS procure NTFPs and surplus agriculture produce in weekly *shandies* which are taken over by GCC. GCC on the higher edge includes value addition measures to tribal produce and its retail marketing in the consumer market. GPCMS acts as linkage for credit activity between GCC and tribals. The loans are provided and modes of collecting back are not harsh.

[1] The information under this head is supplemented personally by the managing Director of GCC, Government of Andhra Pradesh.

There is a facility to repay the loan in cash in easy installments and also in kind i.e, by the way of selling NTFPs to GPCMS at their convenience. The societies repay the loan to GCC after collecting the same from their members (Gamparai 2012).

The following 25 items were notified through the A.P. Scheduled Areas MFP (Regulation of Trade) Regulation, 1979 and monopoly rights for procurement were conferred on GCC. Since the year 2014, there has been remarkable change in the approach of GCC in the procurement of NTFP, Horticultural and Agricultural produce of the tribals.

Items listed under Monopoly rights of GCC

Sl.No	Name of the Commodity	Sl.No	Name of the Commodity
1	Gum Karaya	14	Adda leaf
2	Tamarind	15	Hill Brooms
3	Rock Bee Honey	16	Wild Brooms
4	Apiary Honey	17	Amla Fruit & Seed
5	Honey Wax	18	Cleaning Nuts
6	Myrobalans	19	Mohwa Seed
7	Marking Nuts	20	Mohwa Flower
8	Nuxvomica Seed	21	Terripods
9	Pungam Seed	22	Chiranji
10	Naramamidi Bark	23	Raulphia serpentine
11	Soap Nuts	24	Sugandhipala
12	Sheekakai	25	Kusum Oil Seed
13	Maredugaddalu		

Changes have been effected in regard to monopoly rights subsequently. Through G.O. MS No 68 TW (GCC) Department Dated 16.10.2015 five MFP items viz., 1. Tamarind, 2. Gum Karaya, 3. Mohwa seed 4, Pungam Seed (Karanjee seed) and 5. Chironjee seed have been de- notified from the monopoly list of GCC and the MSP Scheme of Government of India (75% borne by GOI and 25% by GOAP) is being implemented for these denationalized items from 2016-17. Consequent on introduction of MSP scheme for MFP, the Tamarind trade is now thrown open and this benefitted the tribals to get good returns. The GOI fixed a rate of Rs.18 a kg for seeded variety while GCC paid Rs.20 a kg. The tribals sold their produce in the weekly shandies to traders and consumers at rate of Rs.35 to Rs.50 a kg. In the case of deseeded variety tamarind, the MSP was Rs.45 a kg whereas GCC paid Rs.55 a kg. The tribals got a rate of Rs.60 to Rs.65 a kg from the traders due to MSP and presence of GCC in tamarind trade.

The GCC has increased the brand values for certain items especially by obtaining the organic certification for certain items. GCC secured organic certification for the following 15 MFPs and is presently marketing organic products in the consumer market.

- Honey (Agmark grade & organic)
- Nannarisharbat (organic)
- Bilvasharbat (organic)
- Amla powder (Organic)

- Shikakai& Soap nut powders (organic)
- Triphala Powder &Ras (organic)
- Tamarind (organic)
- Chilli powder
- Turmeric powder
- Kumkuma powder
- Ragi powder
- Jasmine, Aloevera, Turmeric, Neem toilet soaps

The GCC by undertaking the retail marketing attempts the following benefits to the tribals:

- Avoidance of bulk sale of raw produce collected by the tribals;
- Value addition to the MFP & Agricultural produce through processing;
- Eliminating middle level market forces and reaching end-consumers directly;
- Explore consumer-market potential for the natural, pure and organic products of the tribals;
- Bring out quality products and to pursue sale in competition with leading brands in market.

The GCC in order to undertake the scaled up activities has also made many institutional arrangements for value addition and retail marketing. The following are noteworthy in this regard:

- Small Industrial units to take up value addition;
- Processing centers in tribal areas and thereby creation of opportunity for supplementary incomes to tribal women;
- Storage godowns exclusively for value added products;
- Distributors' network in major towns for value added products.

Details of industrial units and processing centers

S.No.	Name of the Unit	Location	Production capacity in Kgs/day
1.	Honey processing unit	Rajahmundry	300
	Chittoor		600
2.	Soap making unit	Vizianagaram	9000
	Araku valley		10000
3.	Sheekakayi pulverizing unit	R.Chodavaram	200
	Rajahmundry		70
4.	Tamarind processing unit	V.Madugula, Salur	10000
5.	Turmeric Powdering Unit	V.Madugula	1500
6.	Rajmah packing unit	Paderu	1000

Details of processing taken up

S.No.	Name of MFP	Processing done	End product
1.	Honey	Pasteurization & moisture reduction	Bottled Honey
2.	Tamarind	Deseeding, de-pulping and flower making	Pulp & Flower Tamarind
3.	Soap nuts	Deseeding, pulverizing and extraction	Pulp, Powder & Shampoo
4.	Sheekakai	Deseeding, pulverizing and extraction	Pulp, Powder & Shampoo
5.	Amla	Deseeding, pulverizing and extraction	Powder & Sherbet and in Triphala
6.	Maredugaddalu	Extraction	Sherbet
7.	Myrobolans	Pulverizing and extraction	Triphala powder & liquid concentrate
8.	Tanikaya	Pulverizing and extraction	Triphala powder & liquid concentrate
9.	Hill brooms	Grading & bundling	Packed Broom
10.	Cleaning Nuts	Pulverizing	Packing and branding as NATFLOC

S.No.	Name of the Agrl. commdity	Processing done	End product
1.	Turmeric	Drumming, polishing, pulverizing & packing	Turmeric power packs of differentsizes
2.	Rajmah	Cleaning & packing	Rajmah packs of different sizes
3.	Kattings	Cleaning & packing	Kattings packs of different sizes
4.	White Beans	Cleaning & packing	White bean packs of different sizes
5.	Dry Chillies	Pulverizing & packing	Chilli power packs of different sizes
6.	Ragi	Powdering & Packing	Powder packs of different sizes
7.	Coffee	Roasting, powdering and packing	Powder packs and beans packs; andalso instant powder packs

10.3 Marketing of Coffee

Coffee is a major commercial crop grown by more than 1 lakh tribal farmers in 10 Mandals of Paderu Agency. Through G.O.Ms.No.33 TW (TSP) Department dt.03.06.2015, the State

Government sanctioned a 10 year' Coffee Development Project for Paderu Agency from 2015- 16 to 2024-25 at a total cost of Rs.526.160 crores. This project provides for new Coffee area expansion of one lakh acres, quality improvement through wet processing using baby pulpers, organic certification and marketing intervention by GCC. The mandate given to GCC stipulates pooling of coffee from the growers, its curing / processing and ultimate sale of clean coffee through auctions. It also stipulates payment of 1st installment to the coffee growers towards 50% of the stock value and to pass on the entire sale proceeds (including 50% advance pay- ment) to the growers after the sale of clean coffee. In this background, GCC has taken up pooling of raw coffee of the tribal farmers from 2015-16 onwards after making the following arrangements:

- Publicity Campaign through Pamphlets, Posters and village level meetings.
- Registration of coffee growers was taken up. Around 25000 tribals were enrolled as member in the project.
- Equipment necessary to the field staff for on-spot billing and on line/ off-line reporting of day to day field operations to Head Office is provided.
- Digital moisture meters and electronic weighing scales were introduced.
- Data base was developed on GCC Portal (www.apgcc.in) for on-line reporting from the field and on-line payment to the growers from Head Office.
- "Call Center" with "toll-free" telephone number 1800-425-17777 installed at GCC Divisional office, Paderu to receive complaints of the tribal coffee growers and to redress in a time-bound manner.
- Godowns with Electronic weighing machines and moisture meters and mini-vans (of 2 ton capacity) provided exclusively to the GPCM Societies for coffee.
- 20 pooling centers with Pooling and Quality supervisors and 2 Consultants deployed on outsourcing basis exclusively for Coffee.
- Arrangements were made with APFDC in their Coffee Curing Works, Narsipatnam for curing and storage of clean coffee.
- E-auction arrangements was made with M/s NCDEX E-Markets, Hyderabad for the sale of clean coffee duly providing opportunity to farmers to witness live e-auctions.

10.4 Pricing Procedure Followed

- The Apex Committee fixes pooling rates of raw coffee basing previous year's average rates.
- 50% of the above approved rates is to be paid on-line to the growers into their bank accounts.
- After curing and disposal of clean coffee, GCC to pay entire sale proceeds to the farmers deducting the 1st installment.
- The expenditure for pooling, transport, curing and auctioning is to be met by GCC from the Marketing Subsidy @ Rs. 10 a kg (for clean coffee) from Coffee Board and the Government of A.P. from TSP funds.

- Coffee growers shall be relieved of the burden of expenditure for marketing their coffee.

10.5 Pooling and Marketing of Coffee

A quantity of 1403 MTs of raw coffee in 2015-16 season and 330 M.Ts in 2016-17 season was pooled and marketed. During 2015-16, Apex Committee fixed pooling rates @ Rs.90 a kg for parchment and Rs.46 a kg for cherry coffee. For 2016-17, the pooling rates fixed were Rs.85 a kg for parchment and Rs.40 a kg for cherry. During the current season (2017-18) pooling rate of Rs.85 a kg for parchment and 43 a kg for cherry coffee was fixed and so far 862 M.Ts of raw coffee has been pooled. Another 200 M.Ts is expected to the pooled in this year.

10.6 Benefit to Tribal Farmers

Coffee of Paderu tribals has become an international brand. Leading Exporters like M/s Olam India Agro Pvt Ltd., Bangalore, M/s Mudremane coffee curers, Mudigere (Karnataka) and M/s ITC Agro Business Division, Secunderabad bought this coffee in GCC e-auctions and exported Paderu coffee under the brand name "Araku valley coffee" to Spain, Italy, Dubai, Egypt and other countries.

During 2015-16, tribal farmers who sold parchment coffee @ Rs.80 kg to private traders/brokers during 2014-15 crop season got a rate of around Rs.156/- a kg which is 95% more. For Cherry coffee tribal farmers who sold @ Rs.40/- a kg to traders earlier now got a rate of around Rs.70/- a kg which is 75% more. In 2016-17 season, farmers got a sale rate of Rs.151 a kg for parchment and Rs.82 a kg for cherry coffee on par with international market rates. In coffee trade, there had been a revolutionary change in the tribal areas of Paderu Agency forc- ing the traders to pay rates on par with GCC or to step out from the trade.

10.7 Loaning to Coffee Growers

To relieve coffee growers from the clutches of money lenders and traders, GCC disbursed loans to an extent of Rs.3.50 crores @ Rs.5,000/- to 30,000/- per farmer basing on the expected yields of raw coffee. A concessional rate of interest @ 6 % is only charged. Recovery is made in the shape of raw coffee or through cash as per the choice and convenience of the farmer.

10.8 Organic Certification of Coffee

Coffee is grown by the tribal farmers through organic cultivation and crop maintenance with no usage of chemical fertilizers and pesticides in coffee cultivation. As per the directions of the Government, GCC formed 10 farmers groups in Chintapalli and G.k. Veedhi mandals of Paderu Agency and initiated steps for organic certification under NPOP standards engaging services of M/s IMO Control, Bangalore.

10.9 GCC's Value Addition, Branding and Marketing of Coffee

- Paderu Coffee has earned international reputation for its aroma and flavor. To promote this tribal coffee, GCC got analyzed the mandal-wise coffees at M/s Coffee

Labs, Bangalore and standardized the Blends for powder variants under the supervision of Ms. Sunali Menon, world renowned coffee specialist.

- GCC launched sale of Paderu Coffee with brand name "Araku Valley Coffee" in 5 variants such as powder with coffee-chicory blend @ 60:40, powder with 70:30 blend, 100% pure cof- fee, Roasted Beans and also Instant Powder.
- GCC also launched the sale of liquid coffee to the general consumers and VIPs. It show- cased the products and hot coffee at all international and national events.
- "Gemini Coffee filters" and Italian "Bean to Cup" coffee makers with GCC logo have been installed for continuous dispensing of hot coffee at big events and small stainless steel filters for households.
- Coffee cups (both Ceramic and Paper cups) with GCC Araku coffee logo introduced for serving hot coffee.
- Wooden gift boxes (packed with coffee pouches) also have been introduced.
- GCC has also arranged distribution of pamphlets on "Araku valley coffee Story" at all retail outlets.
- The Coffee variants are made available to the consumers in GCC retail out lets, chain of Distributors, leading super markets, mobile counters and on-line shop.
- Araku valley coffee became an International brand and enquiries are pouring in from Japan, Australia and other countries to open Araku Valley coffee shops in collaboration with GCC.

11. Efforts to Improve Transport Facilities in Tribal Areas

GCC opened new Petrol and HSD bunks at Kakarapadu, K.D.Peta, Narsipatnam, Sileru, Chintapalli, G.K. Veedhi, Pedabailu, Araku Valley, Hukumpeta, G. Madugula in Visakhapat- nam agency and also at R. Chodavaram, Addateegala, Chinturu in East Godavari and K.R.Pu- ram in West Godavari district for improving the transport facilities in interior tribal areas for marketing of NTFP, Agricultural and Horticultural produce of the tribals and other social needs of the general public. In the tribal areas of other districts also new petrol and HSD bunks are being opened.

12. Functioning of GCC: Some Observations by Researchers

Though the GCC in the state of Andhra Pradesh has been revamped, the impact of the reforms need to be studied in detail so as to ensure their stabilization and sustainability. It was noted earlier that organisational setup of GCC is hierarchical, decision making and exercising powers are in the hands of top management and the lower management has to obey the orders. The recent delegations and administrative practices could check this position to a large extent. This needs to be studied in detail for further course corrections if any.

Recent efforts particularly in regard to marketing of coffee do show that attention paid to create positions in the organisation for certain important functions like grading and training of marketing staff. Conduct of market surveys, the collection of price statistics,

estimation of market arrivals etc., which are very important aspects of the marketing of NTFPs seems to have been attended to.

Tribal beneficiaries of GCC market are not totally opposing the provided facilities but have complaints about the inefficient implementation. The amenities in the GCC depot are good but there is a lot of scope for improvement. Societies which play the role of agents have to act as a link between tribals and GCC but the informal middlemen still found to be hanging on to the system.

Storage facilities are reasonably good but they need to be internalized fully by the farmers. There is a need for expanding the storage capacity. Close supervision needs to be stepped up to arrest malpractices if any that continue in any form. The other ambiguity is regarding the price of the produce, the price information needs to be displayed on the notice board to control the prices exercised by middlemen. It is not enough if the info is displayed, but it is to be ensured that price information reaches illiterate farmer in time. For this, enquiry counters to be opened in the GCC depot to help farmers in knowing the price and use of ICT is also required in an aggressive manner.

13. Summary

Tribals live in isolated spheres and that keeps them away from market facilities. Tribals who are farmers and NTFPs gatherers do not have proper facilities to sell and earn profits. So, they prefer to sell the products in weekly shandies. The main problem they face is exploitation due to middlemen, they exercise monopoly, buy produce at very low rates and sell them for huge profits in the retail market. The government of Andhra Pradesh took initiative to regulate middlemen and restrict other unfair practices which are insecure for tribal livelihoods with the Girijan Co-operative Corporation. However, the presence of middlemen still could not be completely wiped away.

Tribals, due to remoteness, illiteracy, language barrier and low risk taking ability are still away from the modern marketing practices. The challenges arise in both agriculture sector as well as non-agricultural sector. Other indirect factors which restrict them from market services are land alienation, lack of agricultural information, the absence of formal credit system, poor logistics, fewer nationalisation of NTFPs, lack of skill in processing and grading, and improper functioning of the formal procuring system.

Smaller holdings of lands or no lands are the results of land alienation which accounts for low agricultural output. Isolation from modern agricultural information leads less yield per acre than expected. Tribals do not show interest in transporting lesser quantities of produce to market. The absence of formal credit system force tribals to depend on informal moneylenders-cum-traders who levy high interest rates. In case tribals cannot repay or take no risk to pay, the agreement is done to sell the produce at low prices. Poor transportation and storage facilities keep tribals away from the market. There are NTFPs where tribals depend on which are not nationalised, encouraging monopoly of middlemen leading to exploitation. Lack of skills in processing and grading allow tribals to sell only raw material which gives them fewer returns. Government and GCC need to address these critical areas on high priority. These all hinder the marketing process and end up in getting low profits.

Ample schemes have been designed by Government of India and State government of Andhra Pradesh to uplift the socio-economic situation of tribals. It is also true that the

more recent efforts of government of Andhra Pradesh eased the marketing situation for tribals to some extent. The efforts in regard to marketing of coffee grown in Paderu agency are particularly effective.

However, educating tribals about market services and marketing strategies for increased returns is still a need. They can introduce Farmers' Facilitation Centres in clusters of villages which act as forward and backward linkage in terms of transporting produce to market. Tribals should equip themselves with skills in post-agriculture activities and in the processing of raw NTFPs. Farmer Producers' Organisations (FPOs) should be adopted for promoting cluster based agriculture for better output and also address challenges of modern agriculture with marketing activities.

14. Recapitulation

1. What are the sources for marketing of produce for tribals?
2. Why are the tribals not able to get fair price for their products?
3. What are the objectives of TRIFED and GCC?
4. What are the difficulties being faced by the tribals for marketing of products through GCC?

15. Keywords

Market, exchange, price, exploitation, credit, producers and consumers

16. Activity

- Find out the products sold by tribals in weekly markets and compare the prices at which the tribals sold with that of the prices in any super market.
- Find out the difficulties in the establishments of Producer's cooperatives in tribal areas.

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Source Book
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Functionaries in Tribal Areas
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As part of the MoU between CIPS and the Tribal Welfare Department, Government of Andhra Pradesh, Amaravati, CIPS has been requested to design a module for the functionaries working in the tribal areas of Andhra Pradesh. CIPS has collaborated with the Department of Anthropology, University of Hyderabad and brought out these modules.

The modules are designed as source books explaining the key concepts, information and reference material pertaining to important aspects of tribal life, culture, economy and various programmes taken up for their development and welfare. Each source book is expected to help the functionaries as self-learning material, equipping the functionaries with the basic concepts, theoretical framework and practical application of the principles concerning various aspects of governance in the tribal areas and of tribal development.

Prof. B.V. Sharma and Prof. N. Sudhakar Rao of Department of Anthropology, University of Hyderabad have edited this volume, assisted by Dr. K. Koteswara Rao, Post-Doctoral Fellow at the Department, under the overall guidance of Sri C. Achalender Reddy, Director, CIPS and his team.