

# The role of palm husbandry in the rural economy of the south-eastern region of Bangladesh

Rana MP, Islam MS

An exploratory study was conducted in Feni, a south-eastern district of Bangladesh to explore the role of palm husbandry in the rural economy. A total of 48 households in the study area were interviewed using a semi-structured questionnaire. Based on the total annual income, the farmers were categorized into three groups as high-income group, medium income group and low-income group. Palm tree contributes 26,000 Tk, 22,740 Tk and 18,300 Tk respectively to the three-income group annually (1 US\$ = 69 Tk). Palm trees contribute 46% of total annual income to low-income group followed by 19% to medium income group and 14% to high-income group. In case of overall income of all the respondents, 26% income comes from palm trees. Besides this, palms provide a multitude of useful products ranging from fuelwood to materials for construction, tools and handicrafts. However the poor marketing system result in decreasing the annual return from palm trees. Palm husbandry could be a promising source of rural incomes in Bangladesh if the farmers' traditional management knowledge was linked to more scientific management practices.

**Keywords:** Agroforestry, Palm, Economics, Rural, Bangladesh

## Introduction

Palm is one of the important horticultural crops in many countries. The palm family (*Palmae*, or more recently *Arecaceae*), with some 2200 species, is distributed throughout the tropics and subtropics (Johnson 1996); representing an integral and important part of tropical forests (Johnson 1995). Situated in the tropical region, Bangladesh also houses a number of palms distributing from hilly topography through plain lands to the muddy mangrove forests (Blatter 1978, Husain 2001). Palm is one of the important horticultural crops in many countries (James 1980, Kamal 1969). In Bangladesh at least 20 species of palms grow naturally (Pasha s.d.). The most common types of palm tree available in Bangladesh are Date palm (*Phoenix sylvestris*), Palmyra palm (*Borassus flabellifer*), Betel nut (*Areca catechu*) and Coconut (*Cocos nucifera*). Presently

these trees are scatteredly grown all over Bangladesh. In Bangladesh very little attention is paid for the systematic cultivation of palm for better yield. A significant economic return is possible from the cultivation of palm (Dowson 1982).

The great economic palm in Bangladesh is coconut (*Cocos nucifera*) (Pasha, s.d.). It is one of the most important homestead and plantation crops of Bangladesh with multipurpose uses (Rahman 2005, Dissanayake 1977). The Palmyra palm (*Borassus flabellifer*) is locally known as *Tal* and tender *Tal* is known as *Daab*. This species also have multipurpose uses (Islam 2006). In Bangladesh Betel nut (*Areca catechu*) are commonly produce along pond bank, roadside in the village area, homestead areas and along canal bank. Betel nut may be chewed alone, but the usual practice is to wrap small slices or pieces of the nut in a leaf of *betel piper*, to which lime is added. It is chewed after meals and on all special occasions (Islam s.d.). In Bangladesh, date palm (*Phoenix sylvestris*) is produced as a homestead crop; however, it grows naturally or is cultivated in fallow lands, around homesteads, farmland boundary and even in the marginal lands along the roads and canals (Anonymous 2000). In the crop fields, the palm is found on the *Ails* (slightly raised embankments used as border of crop fields) and also within the fields along with other crops (Abedin & Quddus 1991). Sap from *P. sylvestris* has been used from time immemorial to produce traditional sweeteners, a

mainstay of Bengali cuisine (Ahmed 2007). Because of the extensive use of its sap in making sugar, it is of considerable importance for household economy in Bangladesh, where cultivation of the palm for tapping is an age-old practice (Kamaluddin et al. 1996). About 85% people are living in the villages and depend mainly on agriculture and tree-based products (Bhuiyan 1991). Since rural household incomes depend mainly on agriculture, landholdings determine the household economy. The rural poor households particularly depend on tree or other plant-based economic activities for their subsistence (GOB 1995). Dalibard (2007) identified various types of palm-crop associations in Bangladesh, which in the words of Islam & Miah 2003 is a strong evidence of multiple land uses to meet the growing needs for the growing people. The rural farmers of south eastern Bangladesh depend upon palm husbandry for their seasonal livelihoods. The present study explores its socio-economic contribution to rural Bangladesh.

## Materials and Method

### Study Area

The study was conducted at Farhad Nagar union (a rural administrative unit consists of a number of villages) of Feni Sadar *upazila* (sub-district; administrative entity) of Feni



**Fig. 1** - Location map of the study area (Banglapedia 2009).

✉ Department of Forestry and Environmental Science, Shahjalal University of Science and Technology, Sylhet-3114 (Bangladesh)

@ Md Parvez Rana  
(Parvez\_200207@yahoo.com)

Received: Nov 03, 2009 - Accepted: Jan 18, 2010

**Citation:** Rana MP, Islam MS, 2010. The role of palm husbandry in the rural economy of the southeastern region of Bangladesh. *iForest* 3: 39-43 [online: 2010-03-02] URL: <http://www.sisef.it/iforest/doi.php?doi=10.3832/ifor0528-003>

district, south-eastern region of Bangladesh (Fig. 1). Feni Sadar *upazila* occupies an area of 197.33 km<sup>2</sup>, is bounded by Chaudhagram, Tripura (India), Parshuram and Chhagalnaiya *upazilas* on the north, Sonagazi and Mirsharai *upazilas* on the south, Chhagalnaiya *upazila* on the east, Daganbhuiyan *upazila* on the west (BBS 1997). The area is located in an important strategic focal point between 22°56'-23°04' N and 91°22'-91°30' E. Total cultivable land 18122.66 hectares; fallow land 249.89 hectares; single crop 6.95%, double crop 83.95% and treble crop land 9.10%. Main crops are paddy, wheat, pulses, sweet potato, chili, sugarcane and groundnut. Extinct or nearly extinct crops are jut and sesame (til). Main fruits are mango, jackfruit, banana, date, palmyra, coconut, etc. (BBS 1997). In the *upazila*, 25.46% of the total households depend on agriculture as the main source of household income, agricultural labourer 9.62%, wage labourer 2.03%, transport 5.45%, industry 1.42%, construction 1.77%, commerce 18.34%, service 20.8% and others 15.11% (BBS 1997).

#### Methods

Palm tree species are one of the major plantation trees for their fruits and sap collection in the south-eastern region of Bangladesh (Pasha s.d.). There are about five districts in the south-eastern region of Bangladesh where palm trees are very much concentrated. A deliberate sampling method was used to locate the Feni district from the five districts of south-eastern region of Bangladesh. From a total of six *upazila*, Feni Sadar *upazila* was selected purposively. The rationale behind the selection of this site because of the availability of palm trees. A multistage random sampling method was applied to locate the villages and households for the study within the *upazila* as the primary sampling unit and ultimate sampling unit respectively. From a total of 16 unions of Feni Sadar *upazila*, one union (Farhad Nagar union) was selected randomly and from the union, one village was selected using the same sampling technique. Then a list of palm tree cultivators was prepared from the village and 48 households (20% sampling frequency) were selected randomly

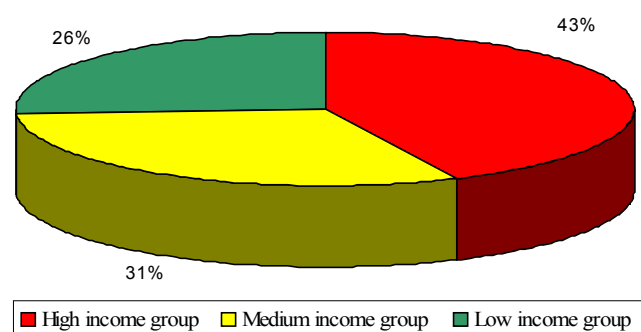


Fig. 2 - Palms owned by different household categories.

for survey and interviewed using a semi-structured questionnaire. Based on the total annual income, the respondents of the study area were categorized into three groups such as high-income group, having total annual income more than 140 000 Tk, medium income group, having total annual income range of Tk 80 000- Tk 139 000 and low-income group, having total annual income of not more than Tk 79 000 (Tk: Taka, Bangladesh currency; 1 US\$ = 69 TK). Some 16 households were selected from each group. Data were collected from different aspect such as data on demographic conditions; occupations and contributions of palm were collected through interview using questionnaires to fulfil the objectives of the study. On each topic the respondents were free to express their views.

## Results and discussion

#### Socio-economic and demographic features

Demographically, in our sample village average family size was 9.5. The average family size was maximum i.e.12 in high-income group followed by 7.5 in medium income group and 9 in low-income group. Besides this, the average-earning member of family was also maximum, i.e., 29% in high-income group followed by medium income group (26%) and low income group (16%). The literacy rate of the study area was 88.65%. The primary occupation in our study area is servicing abroad (38%), followed by business (13%), other profession

(49%) such as teaching, agriculture, construction, labour, etc.

#### Possession pattern of palms tree species

Of the total 560 palms studied, farmers of high-income group possessed 240 individuals (43%), which was the highest value among the different groups and the low-income group possessed only 144 individuals (26%), which was the lowest value (Fig. 2).

#### Production cost and prices of various palm products

The prices of the different products produced from palm vary seasonally and on the basis of locality of the enterprises. The price of the product varies with size, quality and local demand (Rashid et al. 1993). Tab. 1 shows average production cost, average selling cost, average profit and the expected income from different palm tree species products per tree per year. The formula used here is adapted from Vishwakarma et al. (1998), Ahmed et al. (2007); Alamgir et al. (2005), Alamgir et al. 2006a, Alamgir et al. 2006b, Alamgir et al. 2007. From the view point of net average profit per unit, date palm sap was accounted for the highest value (Tk 12) followed by coconut (Tk 9.37). Annual expected income per tree was also highest for date palm sap (Tk 2400) followed by coconut (Tk 750). Date palm was accounted for the highest value (1000) in number of unit sold annually followed by date palm sap (200 liter), bettle nut (120). The least value in net profit per article (Tk 0.22) was found for date palm fruit.

Tab. 1 - Average production cost per unit, average selling price per unit, net average profit per unit, average production (fruit) in amount (unit) per tree per year and income (TK) per tree per year. Tk 69 = 1US\$; (\*): includes production cost and transportation cost.

Palm product (Fruit and sap)	Average Production (Fruit) in amount (unit) per tree per year	Average production cost (Tk) per tree per year	Average selling price per unit (Tk)	Net average profit per unit (Tk)	Income (TK) per tree per year
Coconut	80	50	10.00	9.37	750
Bettle nut	120	20	1	0.83	100
Palmyra palm	110	25	5	4.77	525
Date palm (Fruit)	1000	30	0.25	0.22	220
Date palm (Sap)	200 (liter)	600	15	12	2400

### Contribution of palm tree species in total annual income

Palm husbandry is one of the important means of livelihoods in rural Bangladesh. It plays an active role in the contribution to rural economy, to the cultural heritage of the countrymen as well (FAO 2007). A significant economic return is possible from the cultivation of palm (Dowson 1982, Naik 1963). Our study revealed that the total average annual income for high-income group was 180 000 Tk followed by medium income group (120 000 Tk) and low-income group (40 000 Tk). Palm tree contributes 26 000 Tk, 22 740 Tk and 18 300 Tk, respectively, to the three-income group annually (Tab. 2). By selling of palm products the farmer can uplift their socio-economic condition. This finding also agrees with the findings of FAO (2007), Dowson (1982) and Naik (1963).

Palm trees contribute 46% of total annual income to low-income group farmers followed by medium income group (19%) and high-income group (14% - Fig. 3). Finally in the study area, palm trees contribute 26% of total annual income of the households (Fig. 4). Halim et al. (2008) stated that the landless farmers were found to earn the highest mean annual income from the palm hus-

Tab. 2 - Total average annual income and net average annual income per households from palm trees.

Category	Average total Annual Income (TK)	Net Average Annual Income per households from Palm trees
High income group	180 000	26 000
Medium income group	120 000	22 740
Low income group	40 000	18 300

bandry. This reflects a global trend: for instance, Liedholm & Mead (1993) also found substantial contribution of such sector in the total income. Employment and income from small-scale non-farm enterprise activities, particularly for poor people, are of growing importance in the rural economy of developing countries (Arnold 1995, Gunatilake et al. 1993).

#### Multipurpose use of palm trees

Other than fruit and sap production, the palm is also widely used for some other purposes as mat making, fencing (FAO 2007). Palms provide a multitude of useful products ranging from food, to materials for construction, tools and handicrafts (Balslev & Barfod 1987, Zaid 1999). In the study area, multiple benefits such as fuelwood, thatching material, handicrafts and mats, timber, material

for building construction are also obtained from palm tree. The people of the study area were found to make a huge amount of product by using palm materials. By using coconut palm locally known as *Narikel*, they produce coconut oil, brooms. They also use coconut leaves as fuelwood, for roof thatching, for weaving decorative handicrafts and mats. After the completion of the economic life of a coconut tree, usually 30-35 years, the timber from the straight bole is used for different structural purposes like building construction (e.g., beams, rafters, joists, purloins, banisters, etc.) and boat building, etc. Coconut shells were used for making household utensils, e.g., spoons, *hokkas*, traditionally in the study area. Dry branches of betel nut are a useful fuel in the rural area. After the completion of the economic life of a betel nut tree, usually 20-25 years, the timber from the straight bole is used for different structural purposes like building construction, manufacture of handicrafts. Branches of palmyra palm (*Borassus flabellifer*) are used for making hand fan. It is also used for fencing. Immature palmyra palm that is locally known as *Daab* is a nutritious food. Its branches also can be used as fuel wood. Saps were collected from the inflorescence of palmyra palm, which were used for making toddy. In the study area date palm (*Phoenix sylvestris*) were widely planted for collecting sap. By boiling date palm sap a mixture locally called *Rab* were prepared, which has a strong demand for eating with cake. Date palm branches were widely used as fencing materials in the locality, it also used as fuel wood.

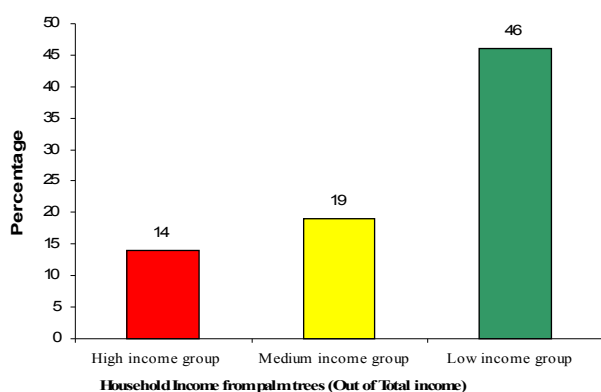


Fig. 3 - Household income from palm trees.

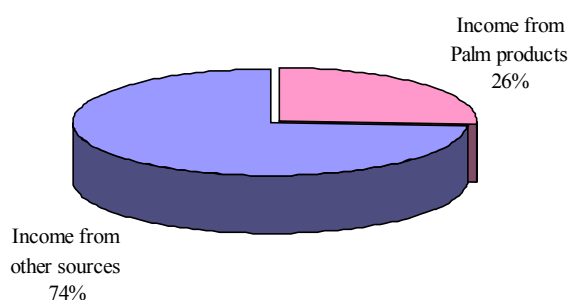


Fig. 4 - Annual income sources of households.

#### Marketing system of the products

According to the farmers' opinion, majority of the palm products are sold to the local markets through middlemen, Tapper or *Gachhi*. Some cases they directly sold it in the local market. In case of date palm after collecting the sap from the palm, sometimes it was reported to be shared with the tapers. The farmers opined that while marketing the date palm produces, sometimes sap is sold directly as drink in the local market. There are several problem arises in the marketing of palm products. The local farmer doesn't get the proper price of their product due to improper marketing system. Sometimes the middlemen get the maximum benefit from the farmer products. This is due to lack of

marketing knowledge and available market information as well as marketing facilities. The price variation might be higher than the stated price, as the middlemen generally do not state the real price. Bakht (1984), Warner (1995), Halim et al. (2008) and Chowdhury et al. (2008) reported the similar barriers of obtaining the information from the middlemen.

## Conclusion

The study established that the income of the farmers from palm husbandry is a significant portion of their annual income and plays an important role in the livelihoods in south-eastern rural Bangladesh. The poor people are mostly dependent on the palm for its income. Thus, palm husbandry plays a vital role in supporting rural people in this particular region for their economic uplifting. The farmers are applying solely traditional management knowledge of their own in the farming and management of this resource, exerting a sustainable manner of utilization. Over the past few decades, the importance of farmers' traditional management knowledge in managing natural resources has gained increasing recognition from the scientific community. Conducting more researches by documentation, exploration and correlation of farmers' traditional management knowledge with scientific technology could easily be a tool for the improvement of the husbandry as well as conservation of this palm. The sustainable management of the palm on the other hand can upgrade the micro-climatic condition, enriching the vegetation resources of the country. The IUCN Palm Specialist Group has already declared the Palm Action Plan (PAP) with a view to conserve the palms and to explore their utilization worldwide (Chowdhury et al. 2008). It might be the time for the policy makers in Bangladesh to pay their attention to assess the potentials of palm and to extend cooperation to support related research activities for the purpose of adding a feather of success in the crown of the Palm Action Plan

## Acknowledgement

Authors are thankful to the rural farmers: without their assistance and cooperation, it would not be possible to reach a proper completion of the study.

## Reference

Abedin MZ, Quddus MA (1991). Agroforestry system in Bangladesh with particular reference to economics and tenurial issue. In: "Agroforestry in Asia and the Pacific" (Mellink W, Rao YS, McDickens D eds). RAPA Publications, Thailand, pp. 25-35.

Ahmed B (2007). Research on the production of natural vinegar from date palm sap. [online] URL: [http://www.rib-bangladesh.org/vinegar\\_research.php](http://www.rib-bangladesh.org/vinegar_research.php)

Ahmed R, Islam ANMF, Rahman M, Halim MA (2007). Management and economic value of *Schumannianthus dichotoma* (Murta) on rural homestead in the Sylhet region of Bangladesh. *International Journal of Biodiversity Science and Management* 3 (4): 252-258.

Alamgir M, Jashimuddin M, Bhuiyan MAR (2005). Employment generation and economics of cane based furniture enterprises of Chittagong, Bangladesh. *Journal of Bamboo and Rattan* 4 (3): 279-292. - doi: [10.1163/156915905774309982](https://doi.org/10.1163/156915905774309982)

Alamgir M, Bhuiyan MAR, Jashimuddin M, Alam MS (2006a). Economic profitability of cane based furniture enterprises of Chittagong city corporation area, Bangladesh. *Journal of Forestry Research* 17(2): 153-156. - doi: [10.1007/s11676-006-0036-y](https://doi.org/10.1007/s11676-006-0036-y)

Alamgir M, Misbahuzzaman K, Hoque ATMR, Masum KM (2006b). Role of non-wood forest products based cottage industry in the livelihood of forest encroachers in Bangladesh. *International Journal of Forest Usufuctural Management* 7 (1): 59-66.

Alamgir M, Mezbahuddin M, Jashimuddin M (2007). Role of bamboo based cottage industry in economic upliftment of rural poor of Chittagong, Bangladesh. *Journal of Bamboo and Rattan* 6 (3): 20-23.

Anonymous (2000). *Encyclopedia of agricultural science*. Anmol Publications Pvt. Ltd., New Delhi, India, vol. 4, pp. 125-155.

Arnold JEM (1995). Socio-economic benefits and issues in non-wood forest products use. In: "Report of the international expert consultation on Non-wood forest products". Non-Wood Forest Products 3, FAO, Rome, Italy, pp. 89-123.

Bakht Z (1984). Entrepreneurship in Bangladesh rural industries. *Bangladesh Development Studies XII* (1-2): 25-58.

Balslev H, Barfod A (1987). Ecuadorean palms - an overview. *Opera Botanica* 92: 17-35.

Banglapedia (2009). National encyclopedia of Bangladesh. Asiatic Society of Bangladesh, Dhaka. [online] URL: [www.banglapedia.org](http://www.banglapedia.org)

BBS (1997). Statistical yearbook of Bangladesh. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the Peoples' Republic of Bangladesh, Dhaka, Bangladesh, pp. 550.

Bhuiyan MK (1991). Impact of social forestry practices. In: "Paper presented at a national workshop on social forestry and community development". Institute of Forestry, Chittagong University (Bangladesh), 5-10 October 1991, pp. 20-31.

Blatter EB (1978). The palms of British India and Ceylon. Dehra Dun, International Book Distributors, India, pp. 110. - doi: [10.1007/s11676-008-0036-1](https://doi.org/10.1007/s11676-008-0036-1)

Chowdhury MSH, Halim MA, Muhammed N, Haque F, Koike M (2008). Traditional utilization of wild date palm (*Phoenix sylvestris*) in rural Bangladesh: an approach to sustainable biodiversity management. *Journal of Forestry Research* 19 (3): 245-251. - doi: [10.1007/s11676-008-0036-1](https://doi.org/10.1007/s11676-008-0036-1)

Dalibard C (2007). The potential of tapping palm trees for animal production. [online] URL: [http://www.fao.org/AG/AGAINFO/resources/documents/frg/conf96htm/dal\\_ibard.htm](http://www.fao.org/AG/AGAINFO/resources/documents/frg/conf96htm/dal_ibard.htm)

Dissanayake BW (1977). Use of *Caryota urens* in Sri Lanka. In: "First International Sago symposium on the equatorial swamp as a natural resource" (Sarawak TK ed). Kuala Lumpur, Malaysia, pp. 84-90.

Dowson VHW (1982). Date production and protection. FAO Plant Production and Protection Paper No. 35, Food and Agriculture Organization, Rome, Italy, pp. 127.

FAO (2007). Date palm sap. [online] URL: <http://www.fao.org/DOCREP/006/Y43601/y4360e03.htm>

GOB (1995). The fifth five-year plan (1995-2000 - Government of Bangladesh) Dhaka, Bangladesh. Planning Commission, Ministry of Planning, Government of the Peoples' Republic of Bangladesh, pp. 345.

Gunatilake HM, Senaratne DMAH, Abeygunawardena P (1993). Role of non timber forest products in the economy of peripheral communities of Knuckles national Wilderness area of Sri Lanka. *Economic Botany* 47 (3): 275-281.

Halim MA, Chowdhury MSH, Muhammed N, Rahman M, Koike M (2008). Sap production from khejur palm (*Phoenix sylvestris* roxb) husbandry: a substantial means of seasonal livelihood in rural Bangladesh. *Forests Trees and Livelihoods* 18: 305-318.

Hussain MD (2001). Harvesting sap from date palm and Palmyra palm in Bangladesh. In: "Proceedings of the second international conference on date palms". United Arab Emirates University, Al-Ain, 25-27 March 2001, pp. 73-77.

Islam SA (2006). Case study on status of palm tree production in Feni District. In: B.Sc. (Hons.) Project paper. Department of Forestry and Environmental Science, Shahjalal University of Science and Technology, Sylhet, Bangladesh, pp. 68.

Islam A, Miah MD (2003). Distribution and productivity of Khejur (*Phoenix sylvestris* Roxb) in the villages of Chittagong region, Bangladesh. *International Journal of Forest Usufucts Management* 4 (1): 49-54.

James CM (1980). Palms of the world. Harper and Brothers, New York, USA, pp. 164-218 and 225.

Johnson DV (1995). Palm conservation: its antecedents, status and needs. In: "World Palm Symposium". Fairchild Tropical Botanical Garden (Miami, FL) 20-21 October 1995, UAE, pp. 135.

Johnson DV (1996). Palms: their conservation and sustained utilization. IUCN Publications Services Unit-219, Huntington Road, Cambridge, UK, pp. 190.

Kamal AU (1969). Fal, Ful and Shack and Sabji. Comilla, East Pakistan. 2<sup>nd</sup> edition, pp. 330-342. (In Bengali).

Kamaluddin M, Nath TK, Jashimuddin M (1996). Indigenous practice of khejur palm (*Phoenix sylvestris*) husbandry in rural Bangladesh. *Journal of Tropical Forest Science* 10 (3): 357-366.

Liedholm C, Mead DC (1993). The structure and growth of micro enterprises in southern and east-

- ern Africa. GEMINI Working paper No. 36, Growth and Equity through micro enterprise Investments and Institutions (GEMINI) Project, Bethesda, Maryland, USA.
- Naik KC (1963). South Indian fruit and their culture (1<sup>st</sup> edn). Varadachary & Co., Madras, India, pp. 313.
- Rahman MA (2005). Plantation crops and organization farming. Rimon Books, Chittagong, Bangladesh, pp. 12-20.
- Rashid MH, Merry SR, Ara R, Mohiuddin M, Alam MJ (1993). How to cultivate rattan and patipata. Bulletin 6, Minor Forest Products Series, Bangladesh Forest Research Institute, pp 8-12 (in Bengali).
- Vishwakarma P, Behari B, Ashutosh S (1998). Economic study of Bansods (Bamboo craftsmen) of Mungelii: a case study. Indian Forester 124 (8): 619-624.
- Warner AT (1995). Marketing, valuation and pricing of NWFPS. In: Proceedings of regional expert consultation "Beyond timber: social, economic and cultural dimensions of non wood forest products in Asia and the Pacific" (Durst PB, Bishop A eds). RAP Publication 1995/13, Regional Office for Asia and Pacific Bangkok, FAO/RAP, 28 Nov - 2 Dec 1994, pp. 97-107.
- Zaid A (1999). Date palm cultivation. FAO Plant Production and Protection. Paper No. 156, Food and Agriculture Organization, Rome, Italy, pp. 145.