TECHNICAL COOPERATION PROGRAMME
BETWEEN
THE MINISTRY OF AGRICULTURE OF ERITREA (MoA)
And The United Nations Development Programme (UNDP)

Date Palm Support Programme in Eritrea
Progress Report





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By

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Reporting Agency:	Ministry of Agriculture & UNDP
Country:	ERITREA

PROGRESS REPORT

No. and title:	Date Palm Support Programme in Eritrea
Reporting period:	January 2024

Reporting International Consultant: Dr Abdallah Ben Abdallah

I. PURPOSE

The Date Palm Support programme in Eritrea is implemented by the Ministry of agriculture (MoA) with the support of UN-Agencies (UNDP- FAO- IFAD) as a joint action.

The basic aims of the Date Production Support Programme are to transfer knowledge concerning date palm propagation, production and protection to local Eritrean experts and farmers and to expand the date palm plantations in both regions of Red Sea Coastal and to support the establishment of commercial plantations in Eritrea.

The Date Production Support Programme provides support for, and coordinates activities of, all components involved in date palm cultivation, including rural communities & household small farmers. The programme can thus be regarded as an umbrella programme that oversees and supports date palm- related activities.

Given the huge potential of the date palm in both regions of Red Sea Coastal, The Ministry of Agriculture is committed to expand date plantations and to introduce new varieties and develop a viable date production sector.

A future developed date sector in Eritrea will contribute to achieving the Government's objectives and would be considered to have the following advantages: contribution to the realization of food security; high nutritional value; crop diversification; land reclamation; creation of job opportunities; income generation; returns in foreign currency earnings; control of desertification & reducing the impact of climate change.

The main goal is to strengthen the date palm sector through strengthening human capacity. Building capacity is focusing on tissue culture staff to capacitate them for the micropropagation of date palm trees, MoA extension, farmers, household families, private sector & date growers.

It is aiming also to expand the number of palm trees & to increase the production of dates by enhancing high yielding and good quality of dates produced through the adoption of modern date production and propagation techniques.

The implementation of this project by the Ministry of Agriculture in Eritrea will have a great impact to raise the national GDP in the country.

The Outcome & outputs of the Date Palm Support programme could be summarized as follows:

Outcome

By 2027, wellbeing and livelihoods of population of the Red Sea Regions improved significantly at household and community levels

OUTPUT 1: Capacity building/Human capacity of tissue culture staff, MoA extension, farmers and private sector date growers strengthened

OUTPUT 2: Robust date palm production system established and operationalized

- Expansion of date plantations through vitro-plants in Red Sea Coast Region
- Enhancing high yielding and good fruit quality date plantations through the adoption of modem date production and propagation techniques

OUTPUT 3: Vibrant date palm production value chain ensured

The reporting International Consultant was nominated by the Ministry of Agriculture (MoA) as Team Leader (TL) for the Date Palm Support Programme (DPSP) in Eritrea.

This report is covering the progress of achievements during the first month of a mission financed by UNDP Eritrea for the 2 months of January & February 2024.

The terms of reference of the International Consultant could be summarized as follows:

The Consultant, in close collaboration with the National Coordinator (Mr. Mussie Fekadu), the national team & the project authorities will implement the following tasks:

- Technical Assistance for Tissue culture Laboratory in NARI
- Continue Training Tissue culture staff of NARI
- Ensure that embryogenic callus produced reach the germination of embryos & produce the first vitro-plants of date palm
- Supervise the purchase of new vitro-plants & assist for their hardening.
- Supervise & follow up the last phase of hardening of tissue culture palms in the nursery & supervise the operations of their distribution & planting with the farmers.

II. RESULTS

- Technical assistance & progress made in the Tissue culture laboratory of NARI:

Following the second mission of the International Technician hired by FAO during October-November for 15 working days, the national Coordinator & the International consultant continued the follow up of the tissue culture & the following results could be highlighted:

- ✓ The stability of the conditions in the growth room, resulting from the establishment of the solar energy for the whole laboratory needs, was a strong factor to achieve some concrete results. The solar Energy system was purchased & installed by UNDP Date Palm Project.

- ✓ Embryogenic calluses were so far produced & transferred on embryo-germination media. The staff of the laboratory well trained by the International Consultant & the hired technician on somatic embryogenesis technique are managing the transfer of the callus & embryos and some of them they are already under light phase. They are promising & will allow to reach an easy germination of embryos & the development of plantlets. (Photo1)

- ✓ Some browning problems, due to oxidation of phenols within the tissue, are appearing in some calluses and the necessary actions to clean them and divided them was provided to the staff. The problem of the browning could be also solved using antioxidant in the media or by a proper drying of the explant prior to inoculation and especially by using activated charcoal.

- ✓ The browning problem could be due to fluctuation of the humidity in the growth chamber during the dark phase. The programme of temperature, light & especially humidity should be fixed as soon as possible by an Electrician.

- ✓ It can happen also that the embryonic callus losses its ability to form vegetative embryos after continuous transfers of callus in the same media for longer periods of time. The callus changes from nodular form of embryos to soft tissues that turn to brown color due to accumulation of phenolic compounds. We recommend in this case to use low concentrations of hormones in the media or reducing the frequency of callus transfer which will reduce the occurrence of the phenomenon.

- ✓ During February & March 2024, we are planning to introduce the maximum of immature inflorescences to be propagated by somatic embryogenesis.



Photo 1 : Progress made in the Tissue culture laboratory of NARI



- **Training on date palm tissue culture in Nakheel Oman Development Company**

Convinced that the personal of the Tissue culture laboratory of NARI should be trained in International Commercial laboratory producing already thousands of date palm vitro-plants per year, the International Consultant in coordination with the National Coordinator initiated a training for 14 days at Nakheel's Tissue culture Center in the Sultanate of Oman financed by UNDP-Eritrea.

This training will be implemented by Mr. Gerbretinsae Tesfagergis & will be starting tentatively on the 5th of February 2024.
The training will encompass laboratory operations and acclimatization of date palm plantlets at various stages.

- **Activities progress in the Nurseries / Hardening of 3400 Tissue culture palms/ List of beneficiaries / Distribution to farmers and planting schedule**

3400 tissue culture date palms, received during April/May 2023, were transferred to two nurseries in Gahtelay & Masswa & were hardened. The hardening was successfully achieved with only 6 plants lost out of 3400 plants. These tissue culture palms are now ready to be distributed & planted (Photo 2).



Photo2: 3400 tissue culture hardened palms ready to be planted in the field

The International Consultant with the National Coordinator paid several field trips, during this month, to assist finalizing the selection of beneficiaries based on several technical criteria mainly the quality of soil, the availability of water & the capacity of the farmer. The list was endorsed by the Extension department of the Ministry of Agriculture (Table1). It is to be mentioned that 6 out of 14 farmers are women.

It is planned to distribute & plant these 3400 tissue culture palms during February/March 2024.

Table 1: Selected Beneficiaries for Distribution of Vitro-plants of Date Palm in the First Phase

S. No	Name of farmer	No. vitro-plants	Zoba	Site	Sex
1	Meleake G/kristos	200	NRS	Dogoli	M
2	Bege Association	150	NRS	Dogoli	F
3	Dali Family (Almaz G/hanes)	500	NRS	Dogoli	F
4	Yakob Kiflay	100	NRS	Dogoli	M
5	Salih Usman	100	NRS	Yangus	M
6	Selemet Ali Mehammed	200	NRS	Emberemi	F
7	Bekita Adel Musa	100	NRS	Emberemi	F
8	Abdalla Swahalli	600	NRS	Shieb	M
9	Mehamed Ali Usman	150	NRS	Shieb	M
10	Usmael Mehammed	100	NRS	Shieb	M
11	Idris Amir	150	NRS	Shieb	M
12	Azeb Agro-industry	400	Gash Barka	Alebu	F
13	Mihret Farm	100	Gash Barka	Aderde	F
14	Corporation of Livestock & Crop	500	NRS	Gahtelay, Kerkebet and Dogoli	-
	Total	**3350**			

- **Reception of 10.000 date palm vitro-plants of Mejhool variety**

As planned for this year 10.000 vitro-plants of date palm Mejhool variety were received on 10/01/2024 in Asmara from Al-Wathba Marionnet Date Palm Tissue culture laboratory in Dubai (Photo3) .

The vitro-plants were placed in 2 nurseries, 5000 plants in Gahtelay NARI- Nursery & 5000 in Massawa Nursery. The advises for taking care of the plants were given to the responsible of the nurseries. Plants can stay in the original pots for 4-6 weeks then will be transplanted into larger pots of minimum 18 cm diameter and 27 cm depth.

Advises for irrigation were also explained & the plants should be placed under 60 % shaded area which are the conditions in the nurseries of Gahtelay & Masswa.

The hardening will take at least 4-6 months and the transplantation in the field will be realized during July -August 2024.



Photo3: 10.000 date palm vitro-plants received during January 2024

- **Gene Bank / Collection of date palm varieties in Gahtelay (NARI-Site)**

The Gene bank plantation was established with 5 varieties (Mejhool, Barhee, Segay, Nawader & Ghennami) and 5 palms from each since February 2023. After 11 months, the growth is very well (Photo4)



Photo4: Good growth of the 5 international varieties in the Gene Bank plantation

- **Reception of Seven New date palm varieties for the Gene Bank in Gahtelay**

Seven New International date palm varieties namely: Khenizi, Hellwa, Fard, Loulu, Om-Dhan, Mazroui & Aiasha, were received during this month & will be planted after hardening along with the first 5 varieties already in advanced stage in the field. The total international varieties are now 12 and will be increased every year.

- **Pollination & Collection of Pollen**

This year we were facing the challenge of early flowering of the female inflorescences due probably to climate change. Since the male palms are less than the female palms, there was a need of pollen. Consequently, we made a car available for our extension agent in Massawa and he is implementing an exploratory visit to several sites.

So far, male pollen was collected from males of date palm between Karen & Afabeet and the distribution was started to provide farmers in Damas, Dogoli … by a first quantity of pollen.

The prospection is continuing to collect more pollen from Ghindae, Naval base, Airport of Masswa and will be transferred to the Pollen center in Massawa.

The International Consultant & the National Coordinator did a big effort to purchase urgently pollen powder of date palm from Emirates. Thanks to the Ministry of Agriculture for financing this urgent action and facilitating its purchase.

With the availability of enough quantity of pollen the whole areas of date palm plantations in the Northern Red Sea region will be provided to date palm trees flowering to be pollinated at the right time by the extension agents and farmers under supervision of National Project Coordinator and international Consultant.

The Network of extension agents established under the supervision of National Project Coordinator and the International Consultant for implementing the operation of pollination created last year, will be activated to assist pollination of date palm in the right time in the Northern Red Sea Region in sub zoba of Afabet, Naval base, Air force, Dogoli, Foro, Demas, Ghatelay and Shieb. The experts from each sub-zoba are ready to actively participate during the whole pollination period with farmers.

- **Women Empowerment**

The beneficiaries of "women empowerment action" will target 2 categories: i) Household female headed family ii) Small scale female farmers.

1. Household female headed family: in this category, women cultivated in their backyard minimum 2 date palm trees with a maximum of 5 date palm trees. 130 family's household (HH) have already received and planted date palms in Massawa. This category of women will be trained on Good Agriculture practices and supported by pollen & equipment for producing dates. As per their demand they will receive more vitro-plants from international varieties.
2. Small scale female farmers: Already 6 women were selected to plant international date palm varieties with a minimum of 1 ha superficies & a maximum of 3 ha. They will be supported by training and equipment along with vegetal material.

Output1: Capacity building for women on good Agriculture practices of date palm
Output2: women date palm farmers plantations equipped by modern irrigation system using solar power, good date palm international varieties, necessary equipment for date palm cultivation
Output3: Women date palm association established

- **Preparation of the first International Conference on date palm in Eritrea**

The first international Conference on date palm in Eritrea is planned to be held in Asmara by the end of August 2024.

The following activities of preparation are under process:

- Concept note for the Conference & estimation of the budget
- Partners to be involved in the organization & the finance of the Conference
- Already an MOU is under process to be signed between the Ministry of Agriculture & Khalifa Award for date palm & Agriculture Innovation of Emirates focused on the first date palm International Conference in Eritrea.
- The partners involved in Date Palm Support Programme in Eritrea (UNDP-IFAD-FAO) will be invited to be partners in the organization & finance of the Conference.

III. lessons learned

- There is a huge need of capacity building at all levels of date palm cultivation, it should be closely implemented not only through training but also through field follow up
- The value chain of dates in Eritrea should be established in parallel with the expansion of date palm plan
- The transportation is a must for the implementation & without transportation facilities the whole programme implementation could be delayed.
- There is a necessity of close coordination between the Ministry of Agriculture & the partners in order to speed up the implementation of the programme

IV. opportunities

- Willingness of the partners to continue financing the expansion of date palm in Eritrea
- Proper & good conditions for date palm in the coastal regions
- Dedication of the farmers including women to cultivate date palm in Coastal regions
- Strong commitment of the Government/Ministry of Agriculture to develop a vibrant & strong date palm sector in the country

V. Challenges

- Date palm female trees are flowering earlier than usual creating a big need of pollen
- Procurement process is slow
- Shortage of skilled staff affected to the programme from Agriculture Extension Department (AED)
- Shortage of technician for date palm tissue culture laboratory if we need to scale up micropropagation of date palm varieties.
- Shortage of diesel used to pump underground water in the date palm farmers plantations.
- A budget of 5 million USD was planned for the 5 years (2023-2027) & still in need to be completed

VI. FUTURE WORK PLAN

- During February – March & April: Supervision & organization of a successful pollination for all plantations in NRSR & SRSR through the established Network of extension staff created in 2023
- Ensure that pollen is available for all sites and provided to farmers in right & due time
- Train Extension staff & farmers on pollination operation and especially on handling and storing of the pollen.
- Introduce the maximum of immature inflorescences for tissue culture propagation
- Ensure all the operations following the pollination especially: thinning of bunches & fruits , suspension of bunches, bunches covering, harvesting/handling of dates & packing.
- Continue the hardening of date palm vitro-plants & their preparation to be distributed to farmers & planted.

VII. Way forward / recommendations

- There is a huge need of capacity building at all levels of date palm cultivation, it should be closely implemented not only through training but also through field follow up
- Continue the expansion of date palm plantations in Northern & Southern Red Sea Regions & increase the number of beneficiaries including 30 % of women.
- Implementation of irrigation system using solar power for the maximum of date palm planation
- Increase the number of personal working in the Tissue culture laboratory of NARI for date palm micropropagation.
- A close coordination between the Ministry of agriculture & UN-Agencies for the date palm support programme has to be enhanced.
- Seeking the contribution of all partners to finance the First International Date Palm Conference in Eritrea
- More than 10.000 vitro-plants from international varieties should be purchase before the end of this year. The other partners are asked to contribute to purchase more vegetal material.