



Science for resilient livelihoods in dry areas

Capacity Development Report

Promoting cactus (*Opuntia ficus-indica*) as drought resilient feed resource under different agroecological production systems across India

February 15 to 18 2020

Prepared by: Sawsan Hassan (ICARDA - Jordan) and Mounir Louhaichi (ICARDA – Tunisia)

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RESEARCH
PROGRAM ON
Livestock

ICAR - ICARDA - Capacity Development

Field Day Report

Activity title: Promoting cactus (*Opuntia ficus-indica*) as drought resilient feed resource under different agro-ecological production systems across India. Project 3: sub project 2

Action site: Bhuj, Gujarat (India)

Sub-activity: Introduction of Cactus (*Opuntia ficus-indica*) as a multi-purpose

Source of funding: ICAR – W3/Bilateral

REF team leader: Dr. Mounir Louhaichi

CAZRI focal point: Dr. Devi Dayal

Key national partner: Central Arid Zone Research Institute (CAZRI), Regional Research Station Kukma, Bhuj, Gujarat

Objective: Increase cactus awareness, dissemination and adoption for improved drought resilience, and to enhance capacity building of all partners

Target audience: Smallholder farmers, livestock keepers and extension agents

Activity mapped to CRP: CGIAR Research Program on Livestock

Lead Center: International Center for Agricultural Research in the Dry Areas (ICARDA)

Flagship: Feeds and Forages



Field day agenda

Date: 17 February 2020

Location: Hatdi Village, Taluka: Mundra (Kachch), State: Gujarat

10.30 AM- 10.35 AM Introduction of Programme

Ms. Meera Vaishnav, JRF-CAZRI, Bhuj

10.35 AM-10.45 AM Plant Watering Ceremony

Dr. Devi Dayal, Head-CAZRI, Bhuj

Dr. Sawsan Hassan, Scientist-ICARDA

Mr. Veerji Bhai, Farmers' representative, Hatdi (Mundra)

10.45 AM-10.50 AM Welcome Address

Mr. M.SureshKumar, Scientist-CAZRI, Bhuj

10.50 AM-11.10 AM Importance of Cactus

Dr. Devi Dayal

11.10 AM-11.20 AM Cactus Feeding Practices Video

Video played by Dr. Sitaram Jat, Lab Incharge-CAZRI, Bhuj

11.20 AM-11.30 AM Package of Practice for Cactus

Mr. Sachin Patel. PA-CAZRI, Bhuj

11.30 AM-11.40 AM Cactus as Intercrop in Horticulture

Dr. Ram Niwas-KVK-CAZRI, Bhuj

11.40 AM-12.00 PM Farmers' Experience on Cactus Cultivation

Mr. Veerji Bhai

Mr. Pappu Bhai

12.00 PM-12.10 PM International Scientist Review on Cactus

Dr. Sawsan Hassan, Scientist-ICARDA

12.10 PM-12.20 PM Open discussion

12.20 PM- 12.30 PM Vote of thanks

Dr. Anand Kumar Naorem

12.30 PM-12.50 PM Cactus field visit

12.50 PM onwards Lunch for participants

Minutes

The field day at Hatdi village, Mundra Taluka was organized on Monday 17 February 2020 by scientists from the Regional Research Station, Kukma-Bhuj, Gujarat, ICAR-CAZRI, Dr. Dr. Devi Dayal, Mr. M.Suresh Kumar, Dr. Anand Kumar Naorem, Dr. Ram Niwas, Dr. Sitaram Jat, Mr. Sachin Patel, Ms. Meera Vaishnav and and Scientist from the International Center for Agricultural Research in the Dry Areas (ICARDA) Dr. Sawsan Hassan. During this event more than 115 participants from different stakeholders (extension representative and office of agriculture and local NGOs were present), among these, 70% were females. The program started with the opening speech from Mr. M. Sureshkumar, Head RRS-Bhuj who welcomed the farmers then Dr. Devi Dayal, Former Head (ICAR-Central Arid Zone Research Institute "CAZRI", Bhuj) elaborated the need of cactus cultivation in Kachchh region. He highlighted the importance of Cactus at Kachchh region. He gave detailed information on how cactus can be grown with minimum water requirement along with its numerous benefits to reduce the gap in fodder especially during summertime. Dr. Devi Dayal highlighted the role of CAZRI in providing farmers with the new technologies based on recent research results and farmers' needs. Spineless cactus is one of these technologies that meet the need of the farmers for green fodder to feed their animals. He emphasized on the importance of cactus as palatable feed that enhance animal intake resulting in better performance and more productivity. He indicated that cactus can be used as a mean for improving the livelihood of farmers through fruit production and other agro-industrial products.



Mr. Sachin Patel, Project Associate-ICARDA project, CAZRI-Bhuj, demonstrated the cattle cactus feeding practices through a video display. He briefed the gathering about the best agronomic practices such as plant spacing, row spacing, plant requirements and best planting time.

Dr. Ram Niwas, SMS-KVK, CAZRI-Bhuj gave a brief talk about possibility of using cactus in different farming systems such as horticulture intercropping. He gave different scenarios to introduce cactus in the current farming systems in the area.

Mr. Veerji Bhai is one of the farmers who planted cactus in his farm shared his experience. He mentioned that due to the water scarcity he was looking for a plant with high WUE that tolerate drought and he came to know about spineless cactus as a perennial fodder plant from CAZRI, Bhuj. He introduced cactus to his farm and started feeding his cattle by mixing cactus with other fodder crops. He appraised the benefits of cactus as a fodder crop, it performs very well with minimum amount of water and it is a palatable fodder crop that supply green fodder for a long period. He was very pleased to have the opportunity to try this new fodder crop and he expressed his keen interest to continue and expand cactus plantation in his farm.

Mr. Pappu Bhai (another farmer who is growing cactus) shared his positive feedback about cactus. In addition to the points mentioned by Mr. Veerji, Mr. Bhai clearly mentioned the low establishment cost of cactus field. It is an excellent option for the local farmers due to its high palatability, growth speedy and low maintenance cost. He encouraged the farmers to grow this crop as it has wide range of advantages.



Dr. Sawsan Hassan welcomed the participants and addressed them about ICARDA's mission as an international organization that conduct research for development in the dry areas. She mentioned that ICARDA in collaboration with ICAR is working to promote cactus as multiple purpose crop. She mentioned the importance of cactus for human, animal and soil health improvement. She briefly explained the best management practices and requirements for optimal growth. Dr. Sawsan mentioned that cactus plantation is expanding in many states across India and most of the farmers are enthusiastic to develop cactus cultivation further primarily for animal feed.



The event concluded with the vote of thanks from the principal investigator of the cactus project, Dr. Anandkumar Naorem (Soil Scientist). He added that a total of 64 accessions/varieties of spineless cactus have been maintained and evaluated at CAZRI farm, Kukma. Out of these 64 accessions, 5 accessions are being distributed to local farmers of Kachchh region, based on their growth and yield of green fodder in the dry climate of Kachchh. The main feature of these accessions is their spineless characteristics which makes it easy to handle and to feed animals. He also mentioned that some accessions have produced fruits that are nutritious and tasty.



After that all participants were invited to visit demonstration field of cactus where 800 cactus plants are successfully grown by prominent farmer. During the field visit, general discussion was made where all participants including farmers were able to ask questions, forward comments and suggest on how cactus can be scaled up in the future. The major issues raised by the participants were how to grow cactus, how many cladodes can be produced by plant, how is the best way to utilize it for animal feed. There were many questions regarding irrigation need of cactus since Kachchh is a dry region, the answer was provided by the farmer who planted cactus that one irrigation per month would be enough for better growth. Dr. Sawsan Hassan not only took the feedbacks and the opinion of the farmers present in the event but also added more information on cactus cultivation and answered all the inquiries of the farmers. The farmers were happy to see the growth of cactus at farmers' field and ready to accept the cactus as fodder crop.

They also wanted to receive information about from where they can get cactus cladodes to plant in their farm. The participants have also tasted the cactus sabzi prepared by Miss Meera Vaishnav, JRF-CAZRI, Bhuj, they were amazed with the crunchy taste of it, as they never tried cactus “Sabzi” before in their whole life. Farmers asked how to get the recipe for Cactus “Sabzi”.



Overall, the farmers were excited at the end of the field day. They mentioned that they were especially pleased with the fact that they had learnt about a new crop and farming techniques. Farmers requested the project to expand cactus dissemination to reach more farmers.

This event was covered by the local newspaper.



કાઝરી આયોજિત કાર્યક્રમમાં કાંટા વગરના થોરનું નિરીક્ષણ કરી રહેલાં જોડનથી આવેલાં મહિલા તજજ્ઞ ડૉ. હસન સ્વાસન, તેમની સાથે કાઝરીના પૂર્વ વડા સહિતના મહેમાનો નજરે પડે છે.

કાંટા વગરના થોરને અપનાવવો જરૂરી

ભુજ, તા. ૧૭ : કચ્છની આબોહવાની સાથે સરળતાથી ઉછરી શકે તેવો મૂળ સીરિયાનો કાંટા વગરનો થોર હવે જિલ્લામાં પોતાની ઓળખ મેળવતો જાય છે પરંતુ હજુ જોઈએ તેવો તેનો પ્રસાર થાય તો પશુધનને ઉચ્ચ ગુણવત્તાના આહારની સાથે પર્યાવરણનું સંરક્ષણ પણ થઈ શકે છે એમ કેન્દ્રીય શુષ્ક વિસ્તાર અનુસંધાન કેન્દ્ર (કાઝરી)ના પ્રાદેશિક સંશોધન કેન્દ્ર કુમા દ્વારા આયોજિત ‘કેક્ટસ ફિલ્ડ ડે’માં વૈજ્ઞાનિકો, તજજ્ઞોએ જણાવ્યું હતું. મુંદરા તાલુકાના હટડી ગામે આયોજિત આ કાર્યક્રમમાં ૬૬ મહિલા ખેડૂતો સહિત ૧૧૫ કિસાનોએ ભાગ લીધો હતો.

મુખ્ય મહેમાન પદે હાજર

રહેલા જોડનની સંસ્થા ‘ઈકાર્ડી’ના આંતરરાષ્ટ્રીય પ્રતિનિધિ ડૉ. હસન સ્વાસને ઉપસ્થિત કિસાનો

‘કાઝરી’ દ્વારા ‘કેક્ટસ ફિલ્ડ ડે’ : જોડનથી આવેલા મહિલા તજજ્ઞ ખેડૂતોને શીખવી થોર ઉછેર પદ્ધતિ

પાસેથી મંતવ્યો જ નહોતાં લીધાં બલ્કે થોરના પાકને લઈને વિશેષ માહિતી પણ પૂરી પાડી હતી.

કાઝરીના કુમા કેન્દ્રના નવનિયુક્ત વડા એમ. સુરેશકુમારના સ્વાગત પ્રવચન બાદ કેન્દ્રના પૂર્વ વડા ડૉ. દેવીદયાલે કાંટા વગરના થોરને કચ્છ માટે અનુકૂળ અને

અપનાવવા યોગ્ય પાક લેખાવ્યો હતો. તેમણે કહ્યું કે આ વિશિષ્ટ થોર કચ્છની સૂકી હવામાં આસાનીથી ઊગી શકતો હોવા ઉપરાંત પશુ આહાર માટે પણ યોગ્ય છે.

થોર ઉગાડનારા ખેડૂતો વીરજીભાઈ અને પપ્પુભાઈએ આ પાકને ઉગાડવા અંગેની પૂરક વિગતો આપી હતી. કાઝરીના મીરા વૈશ્ણવે થોરના શાકાન્તુ નિદર્શન આપ્યું હતું. ડૉ. રામનિવાસ સિંહે કર્મી રીત થોરને આંતરપાક તરીકે લઈ શકાય તેનું માર્ગદર્શન આપ્યું હતું. સચિન પટેલે થોરને પશુ આહારમાં આપવાની પદ્ધતિ વર્ણવી હતી. વૈજ્ઞાનિક ડૉ. આનંદકુમાર નાઓરેમે આભારવિધિ કરી હતી.

Appendix 1: List of Participants in the field day

Personal information including Name, Business Title, Email, Phones, Images and GPS points included in this report have been authorized in writing or verbally by the data subject.

Promoting cactus (*Opuntia ficus-indica*) as drought resilient feed resource under different agro-ecological production systems across India

Bhuj- 17 February 2020

#	NAME	SIGNATURE	*Permission
1	રવજી કાના જાડીયા	રવજી કાના	☐
2	વીરજી દસજી ચુલાર	વીરજી દસજી	☐
3	ચંદ્રાજી માડલો, ચંદ્રાજી	ચંદ્રાજી માડલો	☐
4	કાના જાડીયા	સામલજી	☐
5	દશરથસિંહ ભુલુવા જાડેજી	ડી.વે.નાથ	☐
6	ભુલામ જુમા માલોક	ગુલામ	☐
7	માલોક દિવાદીમ જાડુજી	દિવાદીમ	☐
8	કલ્કલ જુલો. માલોક	કલ્કલ	☐
9	ચુલાઈ રાવળ	પરજી	☐
10	ચૌધરી જયરા ભાઈજી	જયરાભાઈ	☐
11	ચૌધરી ભાવનાબેન જે.	ભાવના રમેશ ચૌધરી	☐
12	રમેશભાઈ જિસંગભાઈ	રમેશજી	☐
13	કરગોવિંદભાઈ કુળપરા	કરગોવિંદ	☐
14	શીવચાલસિંહ જાલા.	શીવચાલ	☐
15	અમલદાસ લાલોચ.	A.P. Baloch	☐
16	નાગજી રમેશ જાલા.	નાગજી રમેશ	☐
17	રમેશ જાલા	રમેશ	☐
18	લાલુભાઈ જાલા અહીર	લાલુભાઈ	☐

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#	NAME	SIGNATURE	*Permission
19	પાળા લેજા, આહીર	પાળા લેજા આહીર	☒
20	નાગદાન, લેજા જાડીયા,	નાગદાન, લેજા	☒
21	નારહા, ભીમાં આહીર	નારહા ભીમાં આહીર	☒
22	સામળ જયું મરંઠ.	સામળ જયું મરંઠ	☒
23	ખીમજી ડાયા જાડીયા,	ખીમજી ડાયા	☒
24	સાંધી, લેજા, ડાંગર	સાંધી, લેજા	☒
25	કુંડુજોન, ગોવીંદ.		☒
26	કુંડુજોન, આળા,		☒
27	અમલોન, દમાં		☒
28	દાનગાવરી જોન, જાળાખાઈ		☒
29	કુવરજોન, મેમાં		☒
30	દેવદેજોન, દિરા,		☒
31	લીસા અરજણ.		☒
32	નરમીજોન, અરજણ.		☒
33	કુંડુજોન, મુકેસા,		☒
34	જીસીજોન, નાગદાન.		☒
35	દાનુજોન, અળા.		☒
36	નરમીજોન, હમીર.		☒

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#	NAME	SIGNATURE	*Permission
37	સવીલા બેન. રમેશ.	સવીલા બેન	☒
38	મેસીબેન. હાજી.	મેસી બેન.	☒
39	હજીબેન. ખાન.	હજીબેન.	☒
40	ફુલબેન. ખાન.	ફુલ બેન	☒
41	મોદી બેન દેવરાજ.	મોદી બેન	☒
42	વલી બેન. રઘુભાઈ	વલી બેન	☒
43	જસી બેન. ડાહ્યા.	જસી બેન	☒
44	મોદી. બેન. ડાહ્યા.	મોદીબેન	☒
45	સલેમામદ ભામુભાઈ	સલેમામદ	☒
46	જેતી ભાઈ વ્યુતાર.	જેતીભાઈ	☒
47	મીરા લૈક્ષ્મી.	Mirani	☒
48	સયાન પર્યે	સયાન	☒
49	મહાવીર સિંહ	Mahavir	☒
50	દાના ભાઈ રજાદીર	દાના રજા રાજા રાજા	☒
51	મહેન્દ્રા સિંહ મીરા.	Mehendra	☒
52	સાહુબેન. વામજી.	સાહુ બેન	☒
53	સંમજી. બેન. સયા.	સંમજી	☒
54	મોદી બેન. વામજી.	મોદીબેન	☒

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#	NAME	SIGNATURE	*Permission
55	લખી.બેન સામંત.	લખી બેન.	☒
56	દેવુંબેન. ભાખા. જારોય.	દેવું બેન.	☒
57	રતી બેન આલા.ડોંગર	રતી બેન આલા.ભાઈ/ડોંગર	☒
58	સાંજું બેન. આલા.ડોંગર	સાંજું બેન આલા.ભાઈ/ડોંગર	☒
59	રતી બેન. આલા. સાંચા	રતી બેન	☒
60	ડેંગલ. દિનેસ. કાલ.ગર	ડેંગલ. દિનેસ.	☒
61	લખી બેન સામંત. જારોય.	લખી બેન.	☒
62	રૂડી બેન. ભાયા. જારોય	રૂડી બેન.	☒
63	જાની બેન. ડાયા જારોય	જાની બેન	☒
64	સાંજી બેન પરબત	સાંજી બેન.	☒
65	કુલર બેન જયું જારોય.	કુલર બેન	☒
66	કરુલી બેન ભાયા.	કરુલી બેન.	☒
67	સોળ.બેન નારકા.	સોળું બેન નારકા	☒
68	આવલબેન મોગાર.	આવલ	☒
69	મંરડ શિલાબેન લેજા	મંરડ	☒
70	મંરડ શિલાબ કશાનભાઈ	મંરડ	☒
71	મંરડ સાકુ રા.મણભાઈ	મંરડ	☒
72	મંરડ સાકુબેન હીરાભાઈ	મંરડ	☒

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#	NAME	SIGNATURE	*Permission
73	મયુરી ઝેન લક્ષ્મીભાઈ	મયુરી	☒
74	રોષિતા બેન સામંતભાઈ	રોષિતા	☒
75	રૂપાલ પાંચાભાઈ મરડે	રૂપાલ	☒
76	અચંતા દિલી દેવદાસભાઈ	અચંતા	☒
77	આશા જાગલી સામંતભાઈ	જાગલી	☒
78	ડો. સ્મિત શેરીન સલીમભાઈ	SEERIN	☒
79	સોલંકી. જયુલે દેવદાસ	જયુલે	☒
80	સોલંકી. લક્ષ્મીબેન	Luxmi	☒
81	સોલંકી. વીરુલે દેવદાસ	वीरु	☒
82	કાનભાઈ રામા ભાઈ જોશી	કાન રામા જોશી	☒
83	કાનભાઈ જોશી.	કાનભાઈ જોશી	☒
84	પાશા. જેસંગ. આદીર	પાશા જેસંગ	☒
85	ભારલા. જેસંગ. આદીર	ભારલા જેસંગ આદીર	☒
86	અના કાના. જોશી	અના કાના	☒
87	કાનભાઈ અનીલ અરજી	અનીલ	☒
88	ભવન ભાઈ ભાઈ ભાઈ	ભવન	☒
89	ભાલા. વંશી. બેન. એમ.	ભાલા વંશી	☒
90	જુ. રાધીકા. સામંતભાઈ	R. S. Ramesh	☒

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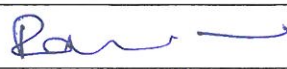
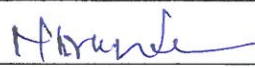
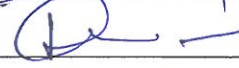
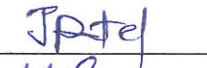
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91	ચેચા, લક્ષ્મી, મેમા, ભાઈ	ચેચા લક્ષ્મી મેમાભાઈ	☒
92	જરુ, હસીના, સામળ, ભાઈ	હસીના	☒
93	ખીમા, કાળા, આણીર	ખીમા	☒
94	મેળાદ, આમળ, વલાડીયા	મેળાદ આમળ	☒
95	ડાઈ બેળ, મેળ	ડાઈ	☒
96	ડિલે, અબોરી	ડિલે	☒
97	નારબ, જીવા	નારબ	☒
98	આળા નારબ, મંડ	આળા નારબ મંડ	☒
99	તેજ મેળાદભાઈ કાળગર	તેજ મેળાદ કાળગર	☒
100	વીજય રવજી જાડીયા	Vijay	☒
101	જાડીયા, રેલર રવજી	જાડીયા	☒
102	જાડીયા બીલીંગ, નાગદ	બીલીંગ	☒
103	બાબુ રાધાધીર ડોંગર	બાબુ રાધાધીર ડોંગર	☒
104	ડો. આનંદ કુમાર	Anand Kumar	☒
105	ડો. રાતીરામજી	Sita Ram Jati	☒
106	સુરેશ કુમાર એમ	Suresh Kumar	☒
107	અંદુ મારી	અંદુ મારી	☒
108	નતા બેળ	નતા	☒

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109	શ્રીલેખ પાઠી		☒
110	જીરુ જામી		☒
111	સતીશ મોહી		☒
112	દલદલ		☒
113	જગદેશભાઈ		☒
114	આદિત્ય શેખ		☒
115	zuber shirpatsinh		☒
116			☐
117			☐
118			☐
119			☐
120			☐
121			☐
122			☐
123			☐
124			☐
125			☐
126			☐

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www.cgiar.org