

Research in Alternative Livelihoods Fund (RALF)

**RESEARCH IN PRODUCTION AND MARKETING OF
SAFFRON AS ALTERNATIVE TO OPIUM POPPY
CULTIVATION**



FINAL TECHNICAL REPORT (DRAFT)

July 2008



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FINAL TECHNICAL REPORT

Date	: June 10, 2008
RALF Project Number:	RALF 02-02
Project Title	: Research in production and marketing of saffron as an alternative to opium poppy cultivation
Organisation	: Danish Committee for Aid to Afghan Refugees (DACAAR)
Collaborators	: Washington State University (WSU) Ministry of Agriculture and Irrigation (MAIL)
Start Date	: Jan 1, 2005 (contract signed May 2005)
End Date	: Dec 31, 2006 (Extension up to Mar 31, 2008)
Budget	: US\$ 424 518 (incl. additional US\$ 25 000 as per Amendment 2)

EXECUTIVE SUMMARY

The rural livelihoods in Herat Province based on agriculture, have been seriously affected by the prolonged drought. Irrigation water is scarce, and the market price for wheat fell drastically in 2003 and only partially recovered in 2004. In this particular situation, poppy cultivation is an attractive livelihood source not only for large farmers who can make significant profits, but also for smaller farmers and even landless sharecroppers. It was based on this circumstance that DACAAR and its partners implemented the project on “Research in production and marketing of saffron as an alternative to opium poppy cultivation” in Herat Province.

The project aimed to contribute to the identification of alternatives to opium poppy cultivation. Specifically, it was implemented to increase understanding and interest by farmers regarding opportunities related to the production of saffron in Pashtun Zarghun District, Herat Province.

The project was organised into four major components such as:

1. Survey of farm economics in relation to saffron production, carried out with male and female community organisations in the target area in order to establish an understanding of risks and opportunities;
2. Analysis of the national and international potential for marketing of saffron;
3. Training of DACAAR staff and potential producers in methods of saffron production; and
4. Establishment of producers’ associations and mechanisms for quality control and marketing

Despite of various constraints that DACAAR and its collaborators have encountered in the course of implementation, the project was still able to achieve the anticipated outputs. The project was able to collect, analyse and disseminate information relevant to the socio-economic dimension of saffron. A survey methodology was designed and tested and 11 DACAAR and 3 MAAHF staff were trained on survey techniques and analysis. Field survey was conducted involving interviews with at least 46 farmers, government officials, traders, farmers associations, shopkeepers, etc. Survey results was disseminated and discussed through saffron field days, workshop and distribution of printed copies. An approximate of 175 farmers, government officials and representative from other NGOs and international agencies participated in the various field days organized by the project. Likewise, a total of 21 participants from saffron growers association, government agencies, academic institutions and NGOs joined the workshop. Numerous printed copies of the English, Dari and Pashto versions of the survey results were distributed during various committee meetings, national saffron workshop and RALF organized workshops.

Through the initiative of the project, national and international market structures for saffron export from Afghanistan was analyzed. Surveys on saffron domestic market in Herat and Kabul were conducted on different years and this survey found out that the price trend is going up. In addition to domestic market survey, international potential for marketing of saffron was also analyzed by visiting saffron market in Dubai and gathering information through various sources. The project also facilitated the establishment of international market linkage and through this activity at least 4 big companies in Europe and America showed their interest on Afghan saffron and the linkage between saffron associations and one local saffron company who export Afghan saffron was established. This company now buys the saffron produced by the associations.

The project have also supported the saffron production and processing needs of the beneficiaries in the project area. The specific production and processing needs in the target area was analyzed by conducting comprehensive social survey, by hiring a consultant and by implementing OFT for saffron varieties. Trainings to at least 16 DACAAR, MAIL, University and other NGOs staff and selected participant from saffron associations in methods of saffron production and processing were provided by the project. The highlights of these staff trainings were focused on the technicalities of saffron production and processing. A demonstration on the use of simple electric drying machine and quality test for the saffron dried under various methods were conducted as part of the training methodologies. From this exercise, it was found out that saffron from local corm can be graded as Grade I based on ISO standard if dried properly. In addition to in country training, DACAAR also sent 2 project staff to Netherlands to participate in the intensive training on saffron production and processing. Upon the return of the staff, re-echo training was held to 23 participants on organic saffron cultivation. With DACAAR and MAIL staff fully equipped with knowledge and skills on saffron production and processing, training to the farmers took place enormously. The project had trained at least 1,938 farmers (34% women) on various topics. Moreover, the project had organized a total of 17 field days with at least 725 (23% women) participants (farmers, government staff, university students etc.) and 8 exchange visits with at least 142 participants (all male). In addition to training, the project also implemented the on farm trial (OFT) to compare the growth and yield performance of Dutch corm and local corm varieties as part of the effort to support the production and processing needs of the farmers. The result of OFT revealed that local corm performed better than Dutch corm with the yield of 250.2 g / 568 m² (30% higher the Dutch corm yield).

Furthermore, the project had also supported the establishment of saffron growers association. A total of 4 saffron growers association have been established and registered with total members of 357 covering 60 villages. One of these associations is women saffron growers association (the first one in Afghanistan) with 57 members and covering 7 villages. A saffron association management committee was also established with members from all saffron associations. The project also supported the establishment of a total of 11.5 Hectare saffron corm bank managed by association. In addition, a saffron quality control laboratory was set up in MAIL Herat office to support the certification and quality control needs of the associations and a National Steering Committee for Saffron Coordination (NSCSC) was created to establish saffron certification and quality control procedures.

Given the above mentioned outputs, there is no doubt that the project has created significant contribution building up of knowledge on saffron in Afghanistan useful for its promotion as alternative to poppy cultivation. The valuable information generated from this research project will provide baseline information to the policy makers and development planners in planning and decision making process relevant to the promotion of saffron. The knowledge and inputs provided to the beneficiaries in the various activities of the project are valuable assets to improve their livelihood.

PROJECT BACKGROUND

In 2004, there was a 64 per cent increase in area under poppy cultivation¹ in Afghanistan with an especially dramatic increase in northern and western provinces, including Herat. Some of this expansion can be attributed to the fact that rural Herat, according to recent data from the NRVA survey, is one of the poorest parts of the country and, in addition was disproportionately impacted by the recent drought because of dependence on rainfed agriculture.

Although poverty is certainly one driving factor in this expansion, in fact poppy cultivation is undertaken by the asset rich as well as the poor. However, whereas for the rich poppy cultivation is a means of gaining huge profits, for the poor it is a matter of survival. On average Afghan rural families cannot produce sufficient from their land to meet the minimum required income and purchasing power. Poppy cultivation, as long as there is no risk of eradication, is the ideal solution since it allows them to set aside a piece of less fertile land on which to cultivate a very high value, low risk crop with which to supplement the low production from the remainder of their land. Since poppy occupies the land for only the first half of the year, farmers can even devote all of their irrigated land to poppy and follow this with fodder or legumes according to the local tradition.

The attractiveness of poppy cultivation for both rich and poor lies to a large extent in its comparative advantages compared with other crops. Poppy, for example, is resistant to natural diseases, requires less irrigation, the residue provides fuel for the winter, poppy seeds have medicinal value, the oil is used for cooking and oil cake for winter fodder and finally the opium resin is high value, has a long shelf life and is easily transported².

In addition, to these advantages, poppy cultivation has for the resource poor become a means of accessing land and credit. Since poppy has been a relatively risk free crop, it appears that landowners may be more willing to rent out land to farmers to grow poppy than to grow other crops such as wheat. Those who can afford to provide the inputs usually lease in land, those without assets enter sharecropping agreements with landowners. In Herat, sharecroppers generally receive one third of the crop if they have provided no inputs. An added advantage for poppy cultivators is that even sharecroppers are usually able to access credit from traders and shopkeepers against a poppy crop.

Most poppy cultivation in Herat takes place on fertile, irrigated land, which might otherwise be used for wheat production. As a result, at the same time as area under poppy cultivation expanded in 2004, area under cereal production decreased 21 per cent³. The higher risks associated with wheat cultivation as compared to poppy cultivation (price fluctuation, sensitivity to natural pests and greater sensitivity to climatic conditions) play a large role in this shift from wheat to poppy, together with the significantly higher value of poppy as compared with wheat. Thus 'valuable and scarce irrigated agricultural land is increasingly being allocated to drug production purposes. According to the National Risk and Vulnerability Assessment (NRVA 2003, updated 2004), the food insecure population increased from 3.8 million in 2003 to 6.4 million in 2004⁴.

In terms of identifying profitable and otherwise attractive alternative crops to poppy, saffron has been identified as having an excellent potential as a high profit, low risk crop suitable to the climatic conditions in Western Afghanistan. Some farmers, especially in the Province of Herat have already started cultivating this crop and the results shows high potentials to improve farmer's livelihood.

¹ Poppy cultivation's impact on food security, FEWS Network, 29.12.04

² Goodhand, J., *Frontiers and wars: a study of the opium economy in Afghanistan*, SOAS, London, January 2003.

³ Ibid

⁴ Ibid

Saffron has a number of comparative advantages over crops such as wheat. For example, the saffron plant is relatively resistant to disease⁵ and requires less irrigation than wheat. The saffron product is high value, has a long shelf life and is light and easy to transport. Both wealthy and smaller farmers as well as less resource rich farmers and share croppers are able to cultivate saffron. Landowners like to rent out land under tenancy or share cropping agreements in Herat for up to five years since this provides some stability for both tenant and landowner. Saffron corms have generally doubled in number after four to five years and old corms are usually lifted after that time as their useful life is over. Landowners are therefore likely to be very willing to allow tenant farmers and share croppers to cultivate saffron on rented or share cropped land even though planting saffron means the leaser keeps the land for an extended period. Although requiring less irrigation than wheat, good quality saffron requires irrigated land. The farmer's irrigated land is thus suitable for wheat, poppy and saffron. However, since saffron is a perennial crop it is not possible to grow poppy on land which is planted with saffron corm. Under the right circumstances, saffron therefore has the potential to be a direct competitor to poppy. Saffron spice processing is labour intensive and family labour is often sufficient for small farmers/share croppers without having to resort to using outside labour, thus saffron is appropriate to the labour condition of small farmers. Since saffron is a relatively risk free cultivation process, saffron cultivators are able to access credit from shopkeepers and, in future, traders against a saffron crop more easily than against a wheat crop.

In spite of the above mentioned comparative advantages of saffron over wheat and other crops, the cultivation of saffron in Herat Province remains limited. Some of the reasons for this are the lack of information relevant to the potentials of saffron, farmers lack understanding thus their interest about the crop is low, the market for saffron is not well established and there is no policy for the promotion of saffron.

PROJECT PURPOSE

Based on the above mentioned information, the project aimed to contribute to the identification of alternatives to opium poppy cultivation. Specifically, it was implemented to increase understanding and interest by farmers regarding opportunities related to the production of saffron in Pashtun Zarghun District, Herat.

The project addressed the above mentioned constraint by collecting, analyzing and disseminating information on socio- economic dimensions of saffron; by analyzing the national and international potential for marketing of saffron; by supporting the production and processing needs of the saffron farmers in the target area and by establishing saffron associations.

RESEARCH ACTIVITIES

Research activities carried out under the project can be categorized as follows:

- a. *Study of farm economics of saffron producers*** – A comprehensive study on the socio-economic aspects of saffron was conducted using a variety of survey methods and interviewing large number of stakeholders. The study involved the collection of data from 46 randomly selected families.
- b. *Survey of domestic saffron markets in Herat and Kabul*** – This study was conducted to identify traders and market dynamic of saffron. The survey was carried during various seasons to determine any fluctuation on the market price of saffron.

⁵ Saffron is nevertheless prone to fungus attack if irrigation water is not drained sufficiently

- c. *Analysis of international potential for marketing of saffron* – Information on international saffron market was collected by visiting markets in Dubai, by internet research, by hiring a consultant and through telephonic contact to saffron traders.
- d. *Study of saffron production and processing needs* - This study was carried by conducting social survey related to production and processing needs. In addition, experts from Iran and a company from Netherlands were hired to further assess the production and processing needs of Afghan saffron and to provide technical advice to overcome the current obstacles. Furthermore, on farm trial (OFT) to compare the performance of Dutch and local saffron varieties was also undertaken.

PROJECT OUTPUTS

In spite of the various constraints that DACAAR and its collaborators have encountered in the course of implementation, the project was still able to manage to achieve all the anticipated outputs. These outputs are summarized as follows:

Output 1: Farm economics of saffron producers analysed and findings disseminated

- a. Developed household based survey methodology on farm economics: In collaboration with WSU experts, procedures for conducting the farm economic survey were designed and tested during the first six months of 2005. Guidelines and template for collecting revenue and cost data on saffron production was also developed by WSU and sent to DACAAR.
- b. Trained staff on survey techniques and analysis: WSU team conducted a 6 days training workshop for 11 DACAAR (8 male and 3 female) and 3 MAAHF staff on interview techniques during the first six months of 2005. In spring 2005, WSU also conducted a one day training workshop followed by four days practical training on interviewing techniques for 10 DACAAR staff (7 males and 3 females) and 3 staff from Agriculture Department Herat. Furthermore, WSU trained the two key members (1 male and 1 female) of DACAAR staff in April 2006 in conducting cost-benefit analysis.
- c. Conducted survey and processed results: The English version of the survey questionnaire was translated in both Dari and Pushto by ICARDA in collaboration with DACAAR in December 2006.

A survey on the social dimension of saffron was conducted in 2005. In normal life, farmers do not make crop choices merely based on the economic returns, they consider other factors also i.e., their subsistence needs, soil fertility, water availability, farm labours and other social aspects. To document the social dimension the following survey methods were used:

- i. Individual commercial farmers (46 saffron and wheat seed growers) both male and female (among tail-enders, head-enders and middle of the irrigation canals)
- ii. Government officials from Antinarcotics department and the department of MAAHF;
- iii. Interview of saffron and wheat seed traders;
- iv. Group interviews of saffron growers, leaders of Saffron Association and other NRM based associations;
- v. Field visits and interview by WSU experts;
- vi. Shopkeepers buying saffron;
- vii. Saffron trader in Herat;
- viii. Saffron sellers in Dubai;
- ix. Study by Dutch consultant, and;
- x. Market analysis by the WSU marketing expert

Furthermore, WSU conducted a survey in Herat in 2005-2006 to understand the farm economics of saffron. The WSU team, DACAAR staff and the three staff from Agriculture Department, jointly collected information from farmers, markets and other sources on the cost and returns from saffron and other major crops and carried out economic analysis in comparison with other selected crops. To gather reliable information the following categories of informants were interviewed:

- i. Saffron growers in Pashtun Zarghun and Gorian districts (both males and females)
 - ii. Wheat seed growers in Pashtun Zarghun (both males and females)
 - iii. Some poppy growers in Gorian
 - iv. Saffron traders in Herat
 - v. Government Officials
- d. Survey results discussed and disseminated: The survey results was discussed and disseminated through saffron field day, saffron workshop and distribution of printed copies. In spring 2005, a saffron field day was organised for different stakeholders to discuss and disseminate survey results and progress of the project. The following persons participated in this field day:
- Farmers from 45 villages = 105
 - Government officials, including the Deputy Governor and President of Agriculture, the District Governor and Heads of various offices = 70
 - Representatives of CRS, Dutch NGO, DAC, CHA, and FAO

A workshop was organised on 16 February 2006 for different stakeholders in Herat to disseminate survey results and findings from other research activities. The following persons participated in the workshop:

- Saffron association leaders from 8 villages = 8
- Government officials including heads of Agriculture extension from Heart, Ghorian and Pashtun Zargoon districts and from Faculty of Agriculture = 5
- Representatives of CRS, World Vision and OBS = 4
- Agronomists from DACAAR = 4

Print copy of the English, Dari and Pashto versions of survey results were distributed to government official and NGOs in Saffron Coordination Committee meeting held in Kabul on 22 January, 2007.

Moreover, the results of survey were also shared in National Saffron Workshop organised by DACAAR and ICARDA in Herat from 14-16 November 2006 which was attended by more than 100 participants from the Afghan Government, provincial departments, Afghan universities, donor institutions, farmers, civil society associations, and development agencies who met to discuss about saffron production and promotion.

Some significant findings from the survey on socio- economic dimension of saffron

- Average family size is 11 (minimum of 4 and maximum of 25)
 - Average family labour is 3 (minimum of 1 maximum of 12)
 - 24 out of 46 farmers interviewed depend exclusively on agriculture, whereas other families also generate a portion of their livings from off-farm opportunities
 - Majority of families interviewed owns land with average area of 9.16 Hectare (minimum 0.8
-
- Water rights (total hours) depends on the available land for cultivation. On the average, farmer can irrigate 0.6 Hectare of land in one hour.
 - Land tenancy is of three types: a) Landownership - The owners themselves do farming and hire labor when needed or employ them for a longer period; b) Sharecropping -Landowners handover a portion of their land to small holders or landless farmers to grow crops and take a portion of harvest; c) Leasing or renting: In this system the landowners rents out a portion or whole of his/ her land for cash or kind. The landowners give some credit or some other farm inputs to the farmer, which they return at the time of harvest or later.
 - Contribution for farm inputs and sharing arrangement in the produce between the land owner and tenant depends largely on the quality of land, socio-economic status (bargaining power) of the landowner and the sharecropper. However the following contractual examples are common:

Farmers take saffron to Herat city, where spice sellers, pharmacies and a small saffron dealer buy it at 20 to 36 USD per kg. Other farmers keep their saffron for two to three years, waiting for someone to come and buy. In general farmers do not know much about saffron market but they follow others. To the saffron growers marketing of saffron spice is the major problem the price is low due to improper processing. According to the saffron farmers in Ghorian, there is a common Afghan-Iranian market at the border, where they can sell saffron to Iranian buyers.

Women prepare corms for planting, help men in soil working, weeding, picking flowers, separating stigmas, and drying, grading and packing of saffron (stigmas). Women plays equal part with men in saffron cultivation however this largely depends on the socio-economic status of their families. In most instances, women work in saffron only if the fields are located away from roads and public places and are close to their residence. If the saffron fields are exposed to public movement even pricking of flowers is done by men and boys only.

Output 2: National and international market structures for saffron export from Afghanistan analysed

- a. Conducted survey of domestic markets analysis in Herat and Kabul: In the autumn of 2005, in collaboration of WSU a survey of domestic markets in Herat and Kabul was carried out. In December 2006, another survey of the saffron market was carried out in Herat to see the fluctuation in prices and it shows that saffron prices have gone up compared to previous year due to less production due to hot summers and heavy rains during flowering season. The saffron price in Herat in 2006 was 400-450 USD /Kg compared to 300 USD/Kg during 2005.

Contacts were established with the Hamidzai Company in Herat who is interested in exporting Afghan saffron. The Hamidzay Company bought saffron from the saffron associations established by the project in Pashtoon Zargon. DACAAR facilitated the contact, but had not been involved in the actual negotiations between the company and the associations.

- b. Analyzed international potential for marketing of saffron: In 2005 DACAAR and WSU gathered information about international saffron markets by visiting markets in Dubai, gathering information from various websites, hiring two Dutch consultants and through telephonic contacts by WSU with saffron traders, etc.

During 2006, information about marketing potential was gathered from other NGOs who are also involved on small scale production and marketing of saffron in Herat particularly from ZOA, French Cooperation Office, CRS, World Vision and the Hamidzai Company. During this time, WSU also made a presentation to these organizations and private companies on ““Entering US saffron markets”” by highlighting the procedures and requirements for entering US market.

In 2007, WSU produced a Report on “Marketing of Afghan Saffron” assessing the potential for selling Afghan Saffron in international markets in general and the American market in particular. This report also considered quality certification needs and challenges and the potential of marketing organic and fair trade saffron. According to this report, the American market offers as good prices as other markets and the demand can easily be absorb the entire Afghani production in the coming years.

- c. Facilitated linkages to international markets: DACAAR in collaboration with WSU contracted

consultants from GSE (Global Sales Exchange), a Netherlands based Company who specialised in saffron production and marketing, to conduct an assessment on the current saffron livelihood activities in the target area. After realizing the potential for Afghan saffron, GSE opened its office in Herat to work with individual farmers not participating in the project. To keep up its link to the project, GSE provided saffron corm to the project in 2006 and in 2007 GSE offered to purchase the entire saffron production from the saffron associations established by the project in the coming 5 years. But after this, GSE never came back to DACAAR to make any follow-up.

In 2006, WSU contacted a number of potential buyers in the United States and three companies expressed their interest in purchasing Afghan saffron. Samples of the Afghan saffron were sent to these companies for their assessment. These companies are:

Buddy Born
Bacstrom Import Co. (www.bacstrom.com)
P.O. Box 1047, El Cerrito, CA 94530 USA
Tel. +1 (510) 236-2131, Fax +1 (510) 236-6402
e-mail info@bacstrom.com

Jonathan Hoffman
Direct Aid International (www.directaidinternational.org),
PO Box 394, Northfield VT 05663 USA
e-mail: hoffman@directaidinternational.org

Juan San Mames
Vanilla, Saffron Imports (www.saffron.com)
949 Valencia St., San Francisco, CA. 94110 USA
Tel. (415) 648-8990, Fax (415) 648-2240
e-mail: saffron@saffron.com

In addition to contacts made by WSU in United States, in 2006 DACAAR had also developed close contacts with Hamidzai Company (Afghansaffron.com), a local company established in Herat in 2006 to market Afghan saffron internationally and with one potential buyer in India:

Saffron Supplier
15, Kedarnath Soceity,
P T College Road, Paldi, Ahmedabad 380007
Gujarat, India, Tel. 00917926632907, Mobile. 0091-9327058276

Furthermore, in 2007 DACAAR had established contact with Organic Partners Ltd. in UK and Institute for Marketecology in Germany to investigate the potential for the marketing of organic and fair trade certified saffron products.

To further strengthen saffron market link, saffron farmers, trading companies, NGOs and Government Departments were given the opportunity to establish linkages and discuss marketing challenges during the Second Afghan Saffron Conference in Herat on November 2007.

As the result of this work, the four Saffron associations in Pashtun Zargun during 2007 harvest season had sold to Hamidzai Company, Shopkeepers in Herat, and Afghans living in Europe and USA, some of which they met at the Second Afghan Saffron Conference in Herat in November 2007, a total of about 49.78 kg saffron spice and the price obtained from Hamidzai Company by the farmers was USD 1300 per kg of saffron.

Output 3: Saffron production and processing needs supported

- a. Analysed specific production and processing needs in the target area: In 2005, detailed information relevant to saffron production and processing needs in the project area was gathered by DACAAR by conducting a comprehensive social survey. Additionally, saffron experts from Iran and the Netherlands were hired to provide advice on the technical aspects of saffron production and processing. The recommendations of these experts were shared with the saffron associations and were adopted by the project in 2006. In November 2006, an additional renowned saffron expert from Iran was hired for five days to assess the saffron processing and to train farmers, DACAAR and MAIL staff on saffron flowers picking, sorting, drying and packing.

During 2006-2007, on-farm- trial (OFT) to compare the growth and yield performance of Dutch corm (provided by GSE) and local variety was conducted in 17 farm sites (Table 1). The results of OFT revealed that the average yield of Dutch saffron corm was 192.6gr/568m² whereas the average local corm yield 250.2 gr/568m². The yield of local corm was 30% higher than the Dutch corm. Furthermore, the Dutch saffron corm was observed to be sensitive to saphrophytic diseases while the local saffron corm showed resistance to this disease. The sensitivity of the Dutch corm to the disease contributed to its low yield performance In addition, it was also found out in this OFT that saffron planting in flat beds surprisingly showed better results than planting on ridges. Yields were higher in flat beds, and planting, harvesting and weeding is easier on flat beds than ridges.

Table 1: Saffron OFT planting method and variety test

village	Farmer name	Treatment	Type of corm	Seed rate Kg/j	Sowing date	Area M ²	Planting method	Fert. Application Kg/j		No of irrigation	No of weeding	Disease/Yes ,No	Yield gr/plot
								DAP	Urea				
Mir/Abad Ulia	Said Ab Qader	T1	Dutch	700	13/09/06	45	Flat	0	0	3	2	Yes	38
		T2	Local	700	13/09/06	45	Flat	0	0	3	2	No	41
		T3	Dutch	700	13/09/06	45	Ridge	0	0	3	2	Yes	23
		T4	Local	700	13/09/06	45	Ridge	0	0	3	2	No	32
Fushkan	Musa Khan	T1	Dutch	700	17/09/06	30	Flat	0	0	1	1	Yes	Owner died, no data available
		T2	Local	700	17/09/06	30	Flat	0	0	1	1	No	
		T3	Dutch	700	17/09/06	30	Ridge	0	0	1	1	Yes	
		T4	Local	700	17/09/06	30	Ridge	0	0	1	1	No	
Rawanda n	Abdul	T1	Dutch	700	18/09/06	30	Flat	0	0	4	1	Yes	7.1
		T2	Local	700	18/09/06	30	Flat	0	0	4	1	No	11.3
		T3	Dutch	700	18/09/06	30	Ridge	0	0	4	1	Yes	8.8
		T4	Local	700	18/09/06	30	Ridge	0	0	4	1	No	9.5
Rawanda n	M.Nader	T1	Dutch	700	20/09/06	44	Flat	0	0	4	2	Yes	7.7
		T2	Local	700	20/09/06	44	Flat	0	0	4	2	No	9.1
		T3	Dutch	700	20/09/06	44	Ridge	0	0	4	2	Yes	7.5
		T4	Local	700	20/09/06	44	Ridge	0	0	4	2	No	8.8
Gulmir	M.Akbar	T1	Dutch	700	14/09/06	45	Flat	0	0	3	2	Yes	4.5
		T2	Local	700	14/09/06	45	Flat	0	0	3	2	No	25
		T3	Dutch	700	14/09/06	45	Ridge	0	0	3	2	Yes	8.5
		T4	Local	700	14/09/06	45	Ridge	0	0	3	2	No	15
Gulmir	Ab.Hamid	T1	Dutch	700	21/09/06	45	Flat	0	0	3	2	Yes	31
		T2	Local	700	21/09/06	45	Flat	0	0	3	2	No	34
		T3	Dutch	700	21/09/06	45	Ridge	0	0	3	2	Yes	34
		T4	Local	700	21/09/06	45	Ridge	0	0	3	2	No	37
Showaba d	Ab.Latif	T1	Dutch	700	21/09/06	45	Flat	0	0	2	1	Yes	12.5
		T2	Local	700	21/09/06	45	Flat	0	0	2	1	No	15
		T3	Dutch	700	21/09/06	45	Ridge	0	0	2	1	Yes	10
		T4	Local	700	21/09/06	45	Ridge	0	0	2	1	No	12.5

T o t a l						1136						442.8
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In 2006, DACAAR provided 40 Kg of corm imported from Netherlands to CRS for trial. Similar to the OFT trial by DACAAR, the results showed that local corm is better in terms of growth and yield. Local corm is more adapted to the Afghan climate and soil conditions and they are less prone to diseases.

- b. Trained DACAAR and MAIL staff in methods of saffron production and processing: In the Second half of 2005, a saffron expert from Iran was hired and a four days training on saffron production and process was conducted by this consultant to 7 DACAAR staff, 2 MAAHF staff, 2 lecturers from Herat University, 1 ZOA NGO staff, 2 CRS staff and 2 leaders of the saffron association. Moreover, the Dutch consultants also did an ample coaching of DACAAR staff and some of the saffron growers during their field visits.

In September 2006 two senior staffs from DACAAR (Saffron Coordinator and Senior Agronomist) were sent for one month intensive training in saffron production and processing by Global Sales Exchange (GSE) in the Netherlands. Unfortunately, the Senior Agronomist disappeared in Netherlands but the Saffron Coordinator returned to Afghanistan after successful completion of training. The training course was effective which resulted to getting an updated knowledge and ideas how to overcome shortcomings in production, processing and marketing of Saffron in Afghanistan. The Saffron Coordinator after returning from Netherlands arranged a three day training course in September 2006 on "Organic saffron cultivation, harvesting and processing according to ISO standards for 23 participants (18 male and 4 female) from DACAAR, CRS, MAIL, Faculty of Agriculture and AKF.

Another Iranian expert was hired in November 2006 to conduct follow-up training on saffron production and processing. This additional training was given for five days (2 days class room lecture and 3 days field work) to DACAAR, MAIL and Faculty of Agriculture and CRS staff. One of the highlights of this training was the demonstrated on the use of affordable drying equipment and the quality test to determine the effect of proper heating on the quality of saffron spice. After the demonstration on saffron drying, the Iranian expert carried out the quality test for the saffron spice dried in different conditions (Table 2). The quality test result shows that even the local corm if dried properly can produce best result even better than the imported corm. The saffron spice produced from local corm can be classified as Grade I based on ISO standards.

Table 2: Results of Saffron test showing the difference in quality when dried by different Methods.

Saffron characteristics	ISO 3632 recommended Standard	Saffron produced from local corms (dried by conventional method)		Saffron produced from local corms (dried by heater)		Saffron produced from imported corm (dried by heater)	
		Quality	Grade	quality	Grade	quality	Grade
Moisture	12 %	9.72 %	II	7.46 %	I	9.88 %	I
Flavour (picrocrocine)	70	74.88		100.06		85	
Aroma (safranal)	20 - 30	42.31		35.01		36.62	
Colour strength (crocin)	190	195.39		278.36		210.83	

In September 2007, staff from DACAAR (10 persons), CRS (2 persons), MAIL (3 persons), the Faculty of Agriculture (4 persons), and NGOs were trained on data analysis and use of saffron quality control equipment. A two-day data analysis course was held for the above-mentioned people; the data

collected on Dutch and local corm was analyzed during this course.

Furthermore, in November a one-day saffron workshop on problem analysis and solving was conducted for participants from MAIL (4 persons), the Faculty of Economy (1 person), the private sector (3 persons), saffron association representatives (4 persons from Pashtun Zargun and 2 persons from Ghorian District), and DACAAR staff (3 persons). Key challenges, problems and constraints for the saffron industry were discussed in relation to marketing of afghan products, lack of production capacity, lack of industry standards, lack of local storage or packaging capacity, and the need for coordination between all industry stakeholders.

- c. Trained male and female villagers involved in saffron production: In 2005, after having received the training from the Iranian and Dutch specialists, the staff of DACAAR and MAAHF conducted 5 training courses on saffron planting and processing to 81 farmers from 19 village organisations. Moreover, 3 days training on bookkeeping was provided to the leader of the associations.

As production and processing of saffron is highly technical, DACAAR provided extensive series of training for both the farmers already involved in saffron production and the new farmers. A total of 37 days of training on saffron production and processing was organised from August to November, 2006 to 500 male and 203 female farmers from 91 villages.

In 2007, follow-up training on saffron production and processing were given to 254 farmers in Pashtun Zargun, training on flower collection and saffron drying to 675 (340 male and 335 female) farmers and 180 farmers (90 male and 90 female) participated in the practical demonstration on the use of electric heater for saffron drying. In addition to technical training, on the same year, 20 male association leaders from the 3 male saffron associations received a three days Community Management and Skills Training (CMST) and bookkeeping and 30 (6 men and 24 women) were trained on accounting and procurement. Aside from formal training session, extension support was also provided to 285 saffron growers on saffron cultivation, weeding, and irrigation.

As part of the training, DACAAR provided the Saffron Associations with 16 heaters, 4 generators, 1000 pairs of gloves, 300 Coverlets.

In 2008, DACAAR developed the practical manual “Saffron Manual for Afghanistan” that describes the planting, maintenance, harvesting and processing techniques of saffron. The manual was translated into Dari and Pashto in coordination with ICARDA. Printed copies of the Dari and Pashto version of the manual were distributed to farmers, trainers, agriculture extension workers, etc. while the English version was published in DACAAR and ICARDA website.

Table 3: Summary of trainings and total number of participants.

Year/Topic	Total Participants	
	Male	Female
2005		
Saffron planting and processing	81	0
Book keeping	3	0
2006		
Saffron production, harvesting and processing	500	203
2007		
Follow-up training on saffron production and processing	254	0

Flower collection and drying	340	335
Accounting and procurement	6	24
Community management and skills training	12	0
Practical demonstration on the use of heater	90	90
Total	1,286 (66%)	652 (34%)
Total (Male + Female)	1,938	

In addition to the trainings provided to farmers in the target area, the project also provided training to other farmers, NGO and MAIL staff in other provinces upon request. In November 2007, 25 farmers and MAIL staff from Helmand, Uruzgan, and Kandahar visited Herat and Pashtun Zargun and received training on saffron production. Similarly, in December 2007, 21 farmers, MAIL, and DACAAR and ICARDA staff in Laghman received training on saffron production in December 2007.

- d. Implemented exchange visits involving farmers and MAIL staff: In 2005, 4 exchange visits to saffron fields were organised for 73 farmers from 22 villages.

During 2006, a total of 8 field days were organized with a total 435 (410 male and 108 female) participants from saffron growers association, government staff, NGO staff and university faculty/students. In addition, within this year a total of 2 exchange visits were organized and this was attended by 32 saffron farmers.

In 2007, 9 field days were held with the total participants of 290 saffron growers (150 male and 140 female). Furthermore, 2 exchange visits for male saffron growers in were also arranged with approximate participants of 35 farmers.

Table 4: Summary of field days and exchange visits and total number of participants.

Details	2005	2006	2007	Total
Total Number of Field Days	0	8	9	17
Participants				
Male	0	410	150	560 (77%)
Female	0	108	140	248 (23%)
Sub - Total		435	290	725
Total Number of Exchange Visits	4	2	2	8
Participants				
Male	0	0	0	0
Female	73	32	35	142
Sub - Total	73	32	35	142

Output 4: Saffron associations established

- a. Saffron growers association established: One saffron association comprising of 102 members was established during 2005. In 2006, another 99 new farmers joined the association, thus bringing the total number to 201. In 2006, DACAAR after discussion with Association management committee and saffron growers split the existing association into three on a geographical basis for better management, two associations in Pashtun Zargun South, and one in Pashtun Zargun North. The total membership of the three associations was 300 by end 2007 and additional of 128 farmers have requested association memberships

Furthermore, as the women are allowed to work in homestead gardens and fields in the vicinity of the

village, it is culturally acceptable for women to fully manage saffron production. Therefore, in addition to the three male saffron associations, Rawindan Women Saffron Growers Association, the first female saffron association in Afghanistan was established in April 2007 in Pashtun Zargun. An interview conducted with the female association by a female anthropologist intern (Marie-Louise Højlund Carlsen) revealed a strong commitment from its members and an appreciation of the empowerment it would bring as the women would be enabled to contribute directly to the household economy. The women were very keen on understanding all aspects of saffron production from cultivation to processing and proven able to produce the saffron without help from male household members.

Registration of the three male and the female saffron associations was completed in 2007, with the facilitation of DACAAR.

In addition to the association members, another 20 male and 260 female (wives of male saffron growers) saffron growers, which are not part of the associations due either to their geographical location or unwillingness to join an association, were also supported by DACAAR.

Table 5: Details of saffron Growers Association by end 2007

Name of Association	No of villages covered by Association	No. of members	Establishment date	Location
Gulmir Saffron Growers Association	20	152	August 2005	Pashtun Zargun South
Fushkan Saffron Growers Association	18	125	July 2006	Pashtun Zargun South
Marabad Saffron Growers Association	15	23	August 2006	Pashtun Zargun North
Rawindan Women Saffron Growers Association	7	57	April 2007	Pashtun Zargun South
Total	60	357	-	-

- b. Association management committees established: An association management committee of 4 leaders was established for the original saffron association and the leaders of these associations were trained in bookkeeping. After the association was divided in to three associations in 2006, a separate management committee for each association comprising of 4 members was established. Similarly, an Association Management Committee comprising of 6 members was also established for the new Rawindan Women Saffron Growers Association.

The Association Management Committees established meet regularly to discuss the problems facing saffron growers. The Association Management Committee had also established accounts in the bank to deposit their funds. DACAAR strengthened the management committees by providing training identified by them. Furthermore, DACAAR had supported the four associations in developing their business plans by providing the essential technical expertise.

- c. Saffron corm banks managed by saffron associations established: In 2005 DACAAR helped establish saffron corm banks on 1.3 Hectare of land. This corm bank was managed by 53 selected farmers. DACAAR supplied a total of 5,455 kg saffron corm to corm-bank farmers.

In 2006 - 2007, the establishment of corm bank continued. At this time, corms were distributed through 4 saffron associations instead of individual selected farmers. The associations then distributed the corms to their members on favourable loan terms. During 2006, DACAAR purchased

4,000 kg local corms and 16,000 Kg of quality corms imported from Netherlands on the recommendation of the Dutch consultants as the local corms are undersized and affected by disease. These corms were distributed to a total of 119 farmers and a total of 5.6 hectares saffron corm bank area was established during this time. In 2007, an additional of 14,584 kg corm was purchased and distributed by association to 128 members to establish a total of 4.5 saffron corm bank.

Table 6: Summary of saffron corm bank establishment.

Year	Volume (Kg) of Saffron Distributed	Number of Farmers who Received	Total Area Established (ha)
2005	5,455	53	1.4
2006	20,000	119	5.6
2007	14,584	128	4.5
Total	40,039	300	11.5

- d. Saffron corm certification and quality control procedures in collaboration with MAIL established: In the effort to establish quality control procedure for Afghan saffron, the Iranian consultant, as part of the training processes for saffron production and processing, conducted the quality test for Afghan saffron dried in various condition. The quality test result shows that the saffron spice produced from local corm can be classified as Grade I based on ISO standards as long as it is dried in a proper manner. Additionally, WSU also tested the saffron sample from Afghanistan. It was noted that faecal coliform bacteria were found in the sample. This is not surprising given that the environment in which the saffron is grown and processed do not have proper sanitation. It is not known whether the bacteria were pathogenic as the sample was not large enough to conduct the necessary test to find out. Nor are all buyers concerned about it because saffron is cooked when used normally. However, it is a matter that needs attention before saffron from Herat is sold in the US or Europe on a large scale.

Other than determining the Afghan saffron quality, DACAAR continuously discussed with MAIL Herat and other stakeholders the idea of establishing saffron corm certification and quality control procedures. The issue was also raised and discussed in National Saffron Workshop held in Herat from 14-16 November 2006 which was attended by high ranking government officials from Kabul and Herat including MAIL officials. During the workshop representatives from government came up with 14 points resolution for national strategy on saffron in Afghanistan and announced to establish a saffron coordination committee. Mr. Saboor Sherzad, Director Alternative Livelihood Programme, MAIL Kabul was appointed as focal point for follow up of recommendations and establishment of the Committee.

Establishment of saffron corm certification and quality control procedures by the government was one of the key points recommended in 14 points resolution. With facilitation from ICARDA and DACAAR, officials from MAIL, MCN, Ministry of Commerce, members of saffron growers association from Herat and partner NGOs met on 22 January 2007 to discuss the recommendations from the workshop. Participants in this meeting agreed to establish a “National Saffron Coordination and Support Committee” with six sub-committees and developed the plan of action to implement the 14 point resolution.

The issue of saffron corm certification and quality control procedures was again raised in the Second Afghan Saffron Conference held in November 2007 in Herat as a follow-up on the discussions from the previous conference held in 2006. Establishment of saffron corm certification and quality control procedures by the government was one of the key points recommended in 14 points resolution from the 2006 Conference, and the National Steering Committee for Saffron Coordination (NSCSC) was established during the Conference. However, NSCSC had not been operational, and focus for the 2007 Conference was on re-vitalizing it, and Government participants in the conference showed a

strong commitment to ensure this. As a result of the 2007 Conference a Conclusions Document highlighting key issues, including the activation of the NSCSC was agreed upon by all participants.

In addition to the discussions relevant to the need to establish certification and quality control procedure, DACAAR had also worked on establishment of saffron quality control laboratory at MAIL Herat in November 2006. The laboratory was handed over to MAIL, and a Memorandum of Understanding specifying the roles and responsibilities in relation to the laboratory was established by MAIL and DACAAR. The provider of laboratory equipment conducted training for 2 MAIL and 3 DACAAR staff on equipment installation, equipment use, and saffron tests on crocin, picrocrocin, saffranal, moisture and ash.

CONTRIBUTION OF OUTPUTS

The project in general has contributed in the building up of knowledge on saffron in Afghanistan useful for its promotion as alternative to poppy cultivation. The information generated as output from this research project will provide baseline information to the policy makers and development planners in planning and decision making process relevant to the promotion of saffron. The knowledge and inputs provided to the beneficiaries in the various activities of the project are valuable assets to improve their livelihood.

The outputs from this research project have already been shared to relevant stakeholders. Information resulting from the project were shared and discussed in various workshops organized by the project or RALF, various committee meetings and field days. To some extent, resulting information from this project have reached to higher policy makers in the government and some grass root levels. Follow up lobbying work with the concerned government agency is essential to develop the saffron policy and massive extension works to further spread information about saffron at the village level are essential to promote the findings from this project for developmental benefits. In addition, follow-up work on the marketing side of saffron is essential to fully harness the potential of this crop to provide viable livelihood to poor Afghan farmers.

The implementation of this research project has provided some significant lessons relevant to the pursuits for alternatives to poppy cultivations. It provided the lessons that:

- The approach should be participatory in which relevant stakeholders especially the community has to take part in planning and decision making.
- It should follow community-based approach where individual target family directly receives the secured benefits.
- Enabling policy should be in place to support the sustainability of the identified alternative to poppy cultivation.