Poverty alleviation through agricultural development: A case study of date palm and vegetable farmers in Panjgoor District of Balochistan

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***Abstract*:**

Agriculture is the main source of earning for human beings and livelihood of 86% of the rural population in developing countries including Pakistan. Studies showed that agricultural development has significantly helped in reducing poverty. The objective of this study was to understand the impacts of agriculture in alleviating poverty in the Panjgoor district of Balochistan. The information was collected from 100 traditional and modern date palm and vegetable farmers. The Data was collected through household survey questionnaires, group discussions and, key informant interviews. Quantitative data was analyzed through Statistical Package for Social

Sciences (SPSS), using descriptive statistics such as, frequency distribution, percentages, ANOVA and mean. Out of six major verities of date, Mozati, Kahraba and among vegetable, okra and soybean played a significant role in improving the socioeconomic conditions (annual income, education and farm inputs such as, water, pesticides, fertilizer and labor charges) in the study area. Overall, modern farmers produced better production and income

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compared to the farmers engaged in traditional farming. In modern farming practices almost all varieties of date palm and vegetable produced better yield and income compared to traditional farming practices. Findings reflected that the decreasing water volume of kariz and farmers' poor economic conditions significantly affected the agricultural development which eventually influenced the farming practices, household income and livelihood. Insufficient inputs and common extension services could not do much in improving the agricultural practices to improve the socioeconomic conditions of small-scale farmers. There is an emerging need to rehabilitate the karizes, provide farmers with the required inputs such as, seed, technologies (trickle irrigation, pollination) grants and modern skills for agricultural development.

Keywords: Agriculture; Poverty; Date palm; vegetable; Practices; Panjgur; Balochistan

1.1 Introduction

Agriculture is the main source of earning for human beings and livelihood of 86% of the rural population in developing countries including Pakistan (World Bank, 2008). Poverty in Pakistan, in my opinion, is too constant and too complex, and cannot be restricted to few factors shown in diagram below. There are many interrelated factors that contribute to poverty in developing nation like Pakistan. Poor governance is the key underlying cause of poverty in Pakistan. The most commonly enumerated causes in this regard include overpopulation, high living cost, rising unemployment, inadequate education, environment degradation, unequal distribution of resources especially agricultural land etc. However, economic vulnerability is a key factor that

leads to social powerlessness, lack of adequate health care political disenfranchisement, everyday harassment and ill-functioning and distortionary institutions. Eeconomic and social factors such as the slowdown in GDP growth in the last decade, and the persistence of a regressive social structure, stemming from the highly unequal distribution of land, have also contributed manifolds to the increase in poverty.16

• Lack of regular income and employment, productive assets (such as land and housing), access to social safety nets;
• Lack of access to services such as education, health care, information, credit, water supply and sanitation;
• Lack of political power, participation, dignity and respect.

Agricultural development is especially successful in reducing poverty. Through country econometric estimates demonstrate that overall GDP growth originating in agriculture is, on standard, at least two times as effectual in benefiting the poorest half of a country's population as growth generated in nonagricultural sectors (WDR, 2009). In expression of land Balochistan is the largest province of Pakistan covering 347,190 open area kilometers (km) and holding 44% of the state's whole land mass. several causes moderate the impact of agriculture productivity growth in non deal goods and poverty decrease including the contribute to of the poor's participating in agriculture and its effects of productivity changes on food prices the share of rural poor engaged in farming according to 1998 figure in Asia 77% poor people live in deficiency line due to not access foods (Gugerty, 2011). Poverty and actual profits are very much interconnected. In cause in genuine proceeds leads to decline of size of poverty so for as agricultural segment is concerned, the farmers still today are following the customary technique of crop growing.

Therefore there is small farming give way redevelopment resulting in rural poverty.

The most of the world's poor citizens get their living from agriculture in the middle of 40 and 50 percent of South Africa's population can be classified as living in poverty (Machethe, 2004). An overview of several studies illustrates the variety of approaches contributing to the consistent finding that agricultural productivity is important for poverty reduction. Datt and Ravallion (1998) found output per unit of land to be statistically significant as a determinant of the squared poverty gap (using national, annual Indian data). Timmer (1997) uses output per worker as the productivity measure to identify linkages to non-agricultural growth since it encapsulates the additional ways through which farm households earn income. Fan, Hazell and Thorat (1999) measure the relationship between total factor productivity and poverty outcomes by investigating returns on different productivity increasing investments. They find that investments in roads, agricultural research, development, and extension had the greatest impact on both productivity and poverty reduction.

The researcher makes it probable through implementing the factors which diminish the poverty through, technological adaptations, empowered politically, household income education, and nutrition. In the world 80% people live in rural areas and 60% people engaged in agriculture and it is estimated that in 2030 the poverty growth will be increased to farm families and local economies for a long term. Investments in farming are the best way against hunger and poverty, and they made life better for billion of people and the caring of poor the care of agriculture. Balochistan is the province of Pakistan far from halving abolition poverty by 2015 and in fact multiple

financial and food price crises from 2007 onward, it is very likely that poverty risen sharply in rural areas.

1.2 Study area

Panjgur District as our study site because it is among the leading date producing districts in Balochistan (PHDEB, 2008; GoB, 2008). Covering an area of 16,891 km^2, with elevations ranging from 465 to 1776 m above the mean sea level (GoB, 2011), the district features dry climatic conditions, which are suitable for date cultivation. Although agricultural land accounts for only 4.6% of the district's land area, the economic mainstay for the majority of the population is livestock production and land cultivation, of which date palm is the major crop (Ghicki, 2011; GoB, 2011). Historically, date palm was already grown in the area when Alexander the Great traveled through the Ketch Valley of Balochistan in the 4th century BC (IHS, 2011). Date palm is known as one of the most resilient species of trees and can survive for several months with very little water as well as in severe climatic conditions (Saleem et al., 2005; Baloch et al.,2006).

This hardiness combined with the market demand for dates might be the main reason why the ancestors of the present-day farmers first started cultivating date palm in Balochistan. The climate of the area is also suitable for growing date palm. The union council Washbood and Zandendaz were randomly selected from other all unions for the survey.

1.3 Methods of data collection and analysis

This is a descriptive type of research. The data sampling was taken randomly from 100 traditional and modern farmers in District Panjgur. We took a list of farmers from Washbood and Zandendaz union councils of the farmers. Furthermore, we applied the simple random sampling technique. Data was collected through primary and secondary sources. Primary sources

included household survey questionnaire, key informant interviews and Focus Group Discussion, while secondary data comprised on books, research articles and websites. Initially, ten (10) questionnaires were pretested among farmers. For instance, five questionnaires were pretested among traditional farmers and the other five on the farmers engaged with modern techniques. Later, necessary modifications were made. Pretested questionnaire have not been included in the sampled population. Data was analyzed through the Statistical Package for Social Sciences (SPSS), applying descriptive statistics such as, frequency distribution and percentages. We collected the data from 100 farmers.

1.4 Result

Respondents' profile

The findings of the analyzed data showed that in modern farming system the farmers were more educated than the traditionalfarmers. In modern farming practices 20% of the farmers were illiterate, while in traditional farming systems the illiterate farmers were 46% in study area. During the research both type of the farmers were asked about their main source of income among them the modern farmers stated that 78% of income is obtained from agriculture, while the traditional farmers said that only 20% of the income is earned from agriculture. For agriculture purpose water plays important role in improving the income of date and vegetable. In traditional farming system 52% of the land was irrigated through kariz water and 48% of the land was barren because of insufficient water, while the modern farming system 100% available water for agriculture purpose.

Table 1: Respondents' profile

	Modern

Traditional farmers		**farmers**
Description	**Percentage (%)**	**Percentage (%)**
Education		
Primary	24	20
Metric	12	26
Secondary	18	34
Illiterate	46	20
Total	100	100
Family type		
Joint	75	45
Single	25	55
Total	100	100
Major source of income		
Agriculture	20	78
Labor (agriculture sector)	58	16
Government job	22	6
Total	100	100

Source: Field survey, 2016

1.5 Date palm

The results of the analysis showed that modern farming practices significantly enhanced the production and income of date as compared to traditional farming system in Panjgoor district of Balochistan (Table 2). Overall, results showed that modern date palm farmers earned average PKRs (2538/-), while traditional farmers' return was rupees (1546), per tree.

Modern practices benefited farmers with more production and income compared to traditional farming techniques (Table-1). Farmers engaged in modern farming practices mostly cultivated kaharaba and mozaty varieties. On the other hand, traditional farmers cultivated mostly kaharaba, Juwansor and mozaty. In both the traditional and modern farming practices mozaty and kaharaba varieties produced better production and income. For example, in modern farming system the Mozaty variety produced the highest average annual income per tree (i.e., Rs 657/-) compared to traditional farming system Rs 287/- (Table-2). Secondly, kaharaba variety produced Rs 530/- in modern farming system however, the return of same variety was calculated as Rs 260/- in traditional farming system.

In modern farming system the Juwansor was observed as third better variety which produced Rs 481/- annual income per tree, while traditional farming practices the same variety produced less income i.e., Rs 257/- per tree. It happened as most of (70%) of date palm trees were infected by the dubas bug, locally called “sherago”. In traditional farming system almost all farmers irrigated their farms through karez water. Furthermore 16% of the farmers applied pesticides in their field. After Juwansor maximum yield was recorded from rabi variety with average annual income per tree of Rs 291/- in modern farming system, while in traditional farming system the yield was low as compared to modern system having an average annual income Rs. 233/- per tree. There was non-significant difference among the Subzo and Haleni variety having average annual income of Rs. 320/- and 259/- per tree, while the yield of both varieties were low having average income of Rs. 194/- and 315/- in traditional farming system.

Table 2: Comparative analysis of annual income of traditional and modern practices of date palm

S.NO	Traditional practices	Annual income per tree	Modern practices	Annual income per tree
	Data palm varieties		Date palm varieties	
1	Kaharaba	260	Kaharaba	530
2	Mozaty	287	Mozaty	657
3	Subzo	194	Subzo	320
4	Rabi	233	Rabi	291
5	Haleni	315	Haleni	259
6	Juwansor	257	Juwansor	481
Total		1,546	Total	2,538

Source: Field survey, 2016

1.6 Vegetables

Modern and traditional farming system on different vegetables namely, okra, soybean, Loofah, Zucchini, Brinjal, Tomato, Pumpkin, and Mixed were cultivated in Panjgoor district of Balochistan (Table-3). In modern farming system among all varieties the maximum income was calculated from the okra variety. Results showed that the annual income of okra was PKRs 18,420/-, whereas, in traditional farming practices similar results were noted among all the varieties with annual income of Rs 10,864/-. Soya bean variety produced better income after okra with average annual income of Rs- 16,724. On the other hand, in traditional practices the minimum average income Rs 5,938/- was recorded.

After both okra and soybean the income of mixed varieties (mention name here) of vegetables ranged in third position having average annual income Rs 6,122/-, while the traditional farming system showed lower income than modern practices with average annual income of Rs 4,182/-. Similarly, the variety of loofah produced better income after mixed varieties having average annual income of Rs 5,820/-, onward the loofah variety in traditional farming system produced less income i.e., Rs 2,701/-.

Zuccchini in modern farming system produced Rs 5,570/- average annual income, even in traditional farming system the average annual income of Rs 2,570/- was obtained. Further in modern farming system the tomato variety produced average annual income of Rs 4,164/- in contrast to traditional farming the annual income was less having average annual income of Rs 3,074/-. Similar trend was observed in brinjal variety having an average annual income of Rs 1,938/- in modern farming practices, while in traditional farming practices the same variety showed minimum average annual income of Rs 1,964/- was noted. Now among all the varieties in modern practices the variety pumpkin provided the lowest average annual income of Rs 1,278/-, weather similarly results in traditional farming practices average annual income of Rs/- 1,220 was calculated. From the present results it showed that in modern farming system there were only 34% area were under cultivation and other 66% of the land were not cultivated while in traditional 40% of the land were used for agriculture practices and the remaining 60% of the area were un-cultivated. Overall, total annual income of vegetables was calculated as Rs 60,036/- from modern farming system, while the traditional farmers earned Rs 25,513/-

Table 3: Comparative analysis of annual income of traditional and modern practices of vegetable

Traditional practices		**Annual Income Pakistani rupees**	**Modern practices**		**Annual Income Pakistani rupees**
Vegetable varieties	**Land under cultivation (%)**		**Vegetable varieties**	**Land under cultivation (%)**	
Okra	13	10,864	Okra	10	18,420
Soya bean	9	5,938	Soya bean	5	16,724
Loofah	3	2,701	Loofah	3	5,820
Zucchini	4	2,570	Zucchini	3	5,570
Brinjal	3	1,964	Brinjal	2	1,938
Tomato	3	3,074	Tomato	4	4,164
Pumpkin	4	1,220	Pumpkin	2	1,278
Mixed	5	4,182	Mixed	5	6,122
Area not cultivated	66%	Total: 32.513	Area not cultivated	66%	Total: 60.036

Source: Field survey, 2016

Discussion

Studies indicated that agriculture seem to be one of the major sources of income and livelihood in most of developing countries including Pakistan, Balochistan in focus (World Bank, 2008; WDR, 2009). In addition, agriculture sector has played a significant role in alleviating poverty worldwide. Nevertheless, the findings of research indicated that agriculture sector since green revolutions is encountered by numerous socioeconomic

and institutional challenges as concerned organizations overlooked the major needs and the problems of small-scale farmers in developing countries in particular. One of the best and many other varieties of date palm were grown in Panjgoor District of Balochistan. Mozaty is one of the best varieties of data palm in the world, mostly cultivated by resourceful and large-scale farmers. Kaharaba is known as the most resilient variety which can bear with meager water, rain fall, wind and diseases to some extent. This variety was therefore mostly grown by traditional farmers. Rabi, Juwansor, variety Subzo, Haleni are fragile verities of date palm. The findings of this study reflected that agriculture sector has played a vital role in improving the household income and human development indicators in Panjgur district of Balochistan. However, farmers in the study area were in miserable condition due traditional practices, insufficient capital and irrigation water. There were many reasons between modern and traditional farming systems. During the data collection it was noted that education is the main difference among them modern and traditional farmers.

The majority (80%) of modern farmers were educated as compare to traditional farmers. The traditional farmers planted the date palm trees haphazardly without taking care full distance, while in modern practices the trees were planted properly taking care of distance about 15-20 feet (5-6 meter). In order in traditional farming practices the farmers claimed they had about 80% of insufficient irrigation water due to climate change in poor karez rather in modern system water managed along karez through modern technology i.e. tube well, dynamo. In traditional farming system there were imitated and poorly managed land, but in modern farming land plated probably with the consolation of experienced farmers and concerned agriculturist. In traditional system mostly aged farmers involved due to

sheared date palm trees, land as well as poor income, while in modern farming practices energetic and enthusiastic farmers were engaged possessing the ownership of land, water and the crops. In traditional farming mostly inherited, shadowy and congested land rather in modern farming system newly and well managed land from them there was full opportunities for crop and trees to get energy from sun and air. In traditional farming dependency on karez and lack of fertilizer opportunity mostly chemical fertilization method was used which was harmful for crops and trees weather in modern method karez, other source with fertilized land were available. In traditional farming method there was a big gap between farmers and agriculture officers, while in modern farming system the farmers requested the agriculture experts to improve their farming methods and other problems (pest, sherago and disease).

Table 4:

A comparative analysis of farming practices in Panjgur district of Balochistan

Traditional practices	**Modern farming system**
Date palm cultivated haphazardly without taking care of distance.	Date palm tree cultivated without taking care of distance 15-20 feet.
Insufficient irrigation water due to climate change and poor karez management.	Water managed through modern technology i.e. tube well, dynamo.
Poorly managed land lack o proper water channel, less management of the field and weeds.	Land plotted properly with consultation of experienced farmers and concerned agriculturist.
Most aged farmers were involved due to shared date palm trees and land as well as annual income.	Energetic and enthusiastic farmers were engaged possessing the ownership of land water and crop.
Most inherited shadowy danced and	Newly and well managed land.

congested land.	
Mostly lack of karez and fertilizers facilities.	Both karez and other sources (tube well, dynamo, bore) and fertilized land.
Lack of collaboration with agriculture officials and farmers.	Farmers requested agricultural experts to improve farming system and overcome the major and minor problems (sherago, pest and disease.

Source: Field survey, 2016

In study area the farmers were dependent on agriculture for their socio economic need. The farmers were not focused on only production they also fulfill their others basic needs such as the frond and trunk of the data palm were used as fuel, huts, for roof of their rooms and for making bridges. The farmers exchanged goods with other things as date with goat, date with grain, date with fish and vegetables were exchanged with oil, sugars, floors and cloths. From the farms the farmers also maintain their live stock to improve their economic condition. The remaining parts of the vegetables, low quality of dates and grasses were feed to animals to obtain different products of milk to run their house and economic needs.

Conclusions and recommendations

The analyzed data showed that modern farmers produced better yield compared to traditional farmers in the Panjgoor district of Balochistan. Results showed that in overall average annual income of date palm varieties the highest income of Rs 58,632/- and Rs 3,388/- were recorded from mozaty variety in both modern and traditional farming system, while the lowest income of Rs 2154/- and Rs 1036/- were recorded from mixed varieties. Similar results were recorded from vegetable varieties in modern and traditional farming system the highest average annual of Rs 18420/- and Rs

10864/- were recorded from okra variety, rather the lowest annual income of Rs 1278/- and Rs 1220/- were recorded from pumpkin varieties.

The major sources of productivity growth were identified which includes, “fertilizer, pesticides, irrigation and improved seed” and the factors which minimized the annual income of the date palm and vegetable varieties i.e. climate change in the region, pest, disease and sherago. Results indicate the relationship between modern and traditional farming system date palm varieties showed better results than vegetables varieties. However, in modern farming system the credit of agriculture was found affective as compared to traditional farming system for the alleviation of poverty. The findings of the researcher indicated that the use of fertilizers, proper distance among the date palm trees and vegetables, proper irrigation system, and improved seeds can significantly influence the productivity of agriculture sector of Panjgur district Balochistan. In addition, the modern farming system in agriculture sector also found to be an efficient and effective means of production.

Our analysis suggests that there is need to do more cultivation of “mozaty” among date palm varieties, while in vegetables it is needed to grow “Okra” variety as well as to provide more modern technologies for the progress in agriculture sector of Pakistan, Balochistan Panjgur district as it is evident that there is a lot of ways for improvement. Most of the modern practices are directly and indirectly controlled by public sector, it is necessary that the public policies may be focused on equitable distribution of technology and modern inputs in all the areas of Pakistan. By doing so, the underdeveloped areas can be brought into the mainstream of Pakistan’s economy.

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