AGRICULTURAL POTENTIAL IN WINDER BASIN, LASBELA: AN ANALYSIS BASED ON FARMER'S PERCEPTIONS

RAZZAQ AHMED, GOHAR ALI MAHAR AND MOHAMMAD JAWED IQBAL

Department of Geography,
Federal Urdu University of Art, Science and Technology, Gulshan Campus, Karachi-Pakistan.
Corresponding author e-mail: razzaqahmed@yahoo.com

Abstract

Agriculture is a prime sector of Pakistan's economy. The vital economic activities of rural society throughout the country are directly or indirectly related to agriculture. The annual population growth rate of Pakistan is 1.55%, which compels to increase agricultural land by reforming agriculture through advanced techniques. The study area is promising for agricultural activities. Crop cultivation, fruit farming and use of rangeland for herded livestock are the main features of agriculture. Though the area possesses much potential for agriculture, due to negligence this resource could not be exploited properly. This study would be beneficial for policy makers and planners for the efficient utilization of agricultural resources, in such semi-arid areas.

Introduction

Agriculture is the single largest sector of Pakistan's economy. It contributes 21 percent of GDP and employs 45 percent of the labor force (GoP, 2011-2012). It accounts for about 70 percent of the foreign exchange earnings, through export of raw material, semi manufactured and processed agricultural products, especially cotton yarn, cotton cloth, raw cotton, and rice. Agricultural activity is practised across the country where about 68 percent of the rural population depends directly or indirectly on agriculture (Pakissan, 2012).

The total land area of Pakistan is approximately 803,940 square kilometers (88 million hectares), of which approximately 20 million hectares (22 percent) is used for agricultural purposes. Around 70 percent of the cropped area is found in Punjab, followed by 20 percent in Sindh, less than 10 percent in the Khyber Pakhtoonkhwa and only 1 percent in Balochistan (GoP 2011). Since independence, the area of cultivated land has increased to more than 33%. However, the country is still far from harvesting the large potential yield that a good soil could produce (Pakissan, 2012). The key to development, even today, lies in proper utilization of agricultural resources. Agricultural planning should be carried out only after the proper evaluation (Alizai, 1998).

The population of Pakistan is increasing at the rate of 1.55% annually (CIA, 2012). Food security is a basic problem particularly in developing countries such as Pakistan, where population growth is causing concern (Ali, 2005). Although a considerable area of arable land has been victimized by urbanization as well as water logging and salinity, this great lost of agricultural land can be compensated by exploring and cultivating new lands. To provide sustainable food security to the rapidly growing population and to enhance agricultural yield, it is necessary to utilize advanced agricultural techniques, increasing cropping intensity, changing major agricultural systems and policies (such as poor incentive policies) etc.

During the last fifty years, agricultural sector of Pakistan has acquired a significant average growth rate as 4 percent per annum (GoP, 2011-12). This expansion is largely the result of improvement in the irrigation system, use of farm machinery, application of artificial fertilizers, and improved seed varieties (Khan and Dhanani, 1998). However the sustainable domestic food security is based on traditional process that is an important issue in the country's agricultural sector. As a consequence Pakistan still remains a food importer.

Study area: Winder basin is a part of the Lasbela plain located near the Makran Coast of Lasbela district of Balochistan (Fig. 1). The area is bounded by the Mor and Piaro ranges in the east and north-east and the Haro, Liddah Koh and Harag Koh in the west and north-west, while the Arabian sea is located to the south (Ahsanullah, 1971). The Lasbela plain is located between latitude 25^{o} 18'N to 26^{o} 14'N and longitude 66^{o} 06'E to 66^{o} 40'E. The triangular shaped re-entrant plain of Lasbela is the result of the alluvium deposits of the Porali River and its tributaries (Spate, 1956). The plain is about 64 km wide along its base and tapers north for about 88 km along the braided Porali River. Aridity combined with strong south-west winds resulting wide coastal sand dune belt whose sea-ward margins are formed by long fine beaches (Ahsanullah, 1971). About 6 percent of total land of Lasbela district is under cultivation whereas 71.4 percent of the total land is considered as cultivable waste (GoB, 1998).

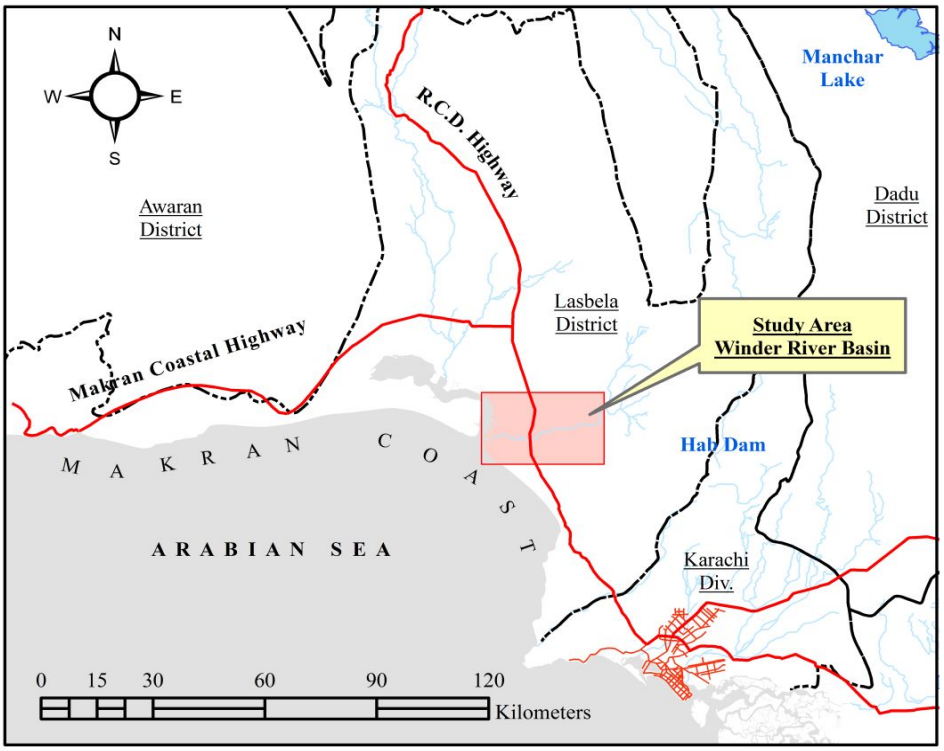

Fig.1. Study Area; Winder River Basin.

The eastern part of the plain is drained by the Winder River which forms an estuarine delta at Miani Hor. The catchment area of the Winder River is extremely limited, bounded by Mor and Pab ranges. The entire basin is covered by fresh alluvial silt, washout from torrential rain. Such deposited material along the river is highly suitable for cultivation. The basin has also a considerable vegetation cover and sufficient ground water which may be easily developed for stock-farms or ranches. The rest of the area is covered by rangeland (Ahsanullah, 1971).

Climate of the Lasbela plain is subjected to the semi-arid conditions. The rainfall is erratic and scanty. The plain area is located at the transitional zone of the rainfall regime of Pakistan (Khan, 1993). Therefore, it receives rain from both systems (Monsoon in summer and Western Depression in winter). Due to unreliable rain, tube wells are the major source of irrigation.

Besides cultivation of land, livestock production is also a significant economic activity in Winder. Goats are the predominant species followed by other cattle like cow, buffalo and donkey. Buffaloes are kept mostly in those areas where water is readily available. Plantation of the fruit farms and cultivation of crops by irrigation are found as an important feature of the study area. Use of rangeland as an important economic activity is also very prominent. Along with the limited farming, fishing is another type of income and sustenance for the local population which is practiced in scattered ponds.

The Plain of Lasbela is promising agrarian land (Ahmed and Mahmood, 2007). The food security of the population can be achieved by improving the productivity of crops, discovering and utilizing productive land by applying modern technologies. Long-term planning and management of this area could provide the long term impact in the whole region. Proper exploitation of resources and good management can boost the economy of the local community as well as the whole region. The long term water management program will also meet a continuing need of Balochistan province for adequate requirements of water, especially in the view of the expanding acreage of fruit orchards (Haider, 2007).

Since no relevant research has been carried out on Winder basin, the main purpose of the study is to find out the existing land use activities and to discover the potential for future planning and development of the area. The land-use activities are carried out by the utilization of indigenous resources found in that environment's energy supply and manpower.

In this study the main objectives intended to be achieved are to:

- Provide a description of commonly-occurring agriculture system in the Winder Basin
- Analyze the type of the land use activity found in the Winder area
- Evaluate the use of rangeland
- Speculate on future trends in agriculture systems within the Winder Basin
- Consider possible strategies for sound land use in the future

Materials and Methods

The phenomena of the study area, during the reconnaissance, drew our attention to prepare primarily an informal and unstructured questionnaire which was developed for discovering the system of agricultural activities found in the study area.

The simple random sampling was adopted for surveying and forty-eight responses of questionnaire were completed by interviewing local residents. Additional information was gathered through informal discussions with farmers. Several visits and village walks were conducted in many places to arrive at a general picture of the study area. Some related archive information was also sourced.

Satellite data of SPOT 5, (2008) and Google Earth, (2013) were used to prepare a detailed land-use map of Winder River basin.

Results and Discussion

Land is a key resource for human activities and environment changes are deeply embedded in the way it is used, especially in agricultural regions (Li *et al*, 2001). Location, physiography and vegetation cover collectively define Winder basin as a very productive place for agriculture. The development of land use and other economic activities were initiated with the help of indigenous resources. Therefore, traditional types of agriculture such as cultivation of crops, fruit gardening and rangeland have been observed within the study area. Fig. 2 depicts the detailed land-use map of the study area.

i- Irrigated Cropping: Winder is located in a semi-arid region having a large variability of rain. Therefore, cultivation of crops and fruits is totally dependent on irrigation. Nowadays role of irrigation is vital to enhance crop production (Jhorar *et al*, 2009). Irrigated fields are small but very productive for crop cultivation (Mahar *et al*, 2013). Wheat is the most grown commonly staple food crop cultivated commercially in the Winder area. It is grown in November-December and harvested in March-April. Radish, pumpkin, cucumber and tomato are the important cash crops and supplied daily to the main market. Lucerne and other fodder species are also cultivated for livestock.

Generally, the supply of water is possible by means of ground water. Tube wells are the major source of irrigation (Fig. 3A). Water is extracted with the help of electrically operated water lifted pumps. Through a series of gravity-fed channels, it is supplied efficiently to the fields (Fig. 3B). During the survey the depth of the wells was estimated to be about 300 feet. Many electrically powered pumps were seen at the edges of villages (locally called *Goths*). The electricity for irrigation purpose is provided at a subsidized rate by the government. This type of irrigation is not supposed to be burden on the economy of the farmers because only four thousand rupees per annum are charged from each farmer (based on field survey). It is a highly appreciable incentive granted by the government. Chemical fertilizers such as nitrogen (urea) and DAP are mostly used to enhance the productivity of the land.

ii- Fruit Farming: Fruit farming is also a major and prominent activity found in the study area. It is one of the productive farming systems because it gives reasonable return. Comparatively in smaller areas a large number of trees are grown and their fruits are harvested. It is estimated that fruits are weekly or fortnightly supplied to the market for three to nine months depending on the type of fruit. Fruit farming needs one-time investment for many years until the life span of trees are expired. Guava, banana, papaya, mango, melon sapodilla[1] and date are most commonly grown (Fig. 4). Banana is a very productive fruit which is continually harvested for nine months. Gauva is the most famous and well known fruit cultivated in this area. A considerable area of papaya and sapodilla was also observed. Table 1 depicts the outlay and profit of different fruits grown in this area from selected farms.

[1] Locally known as Chikoo

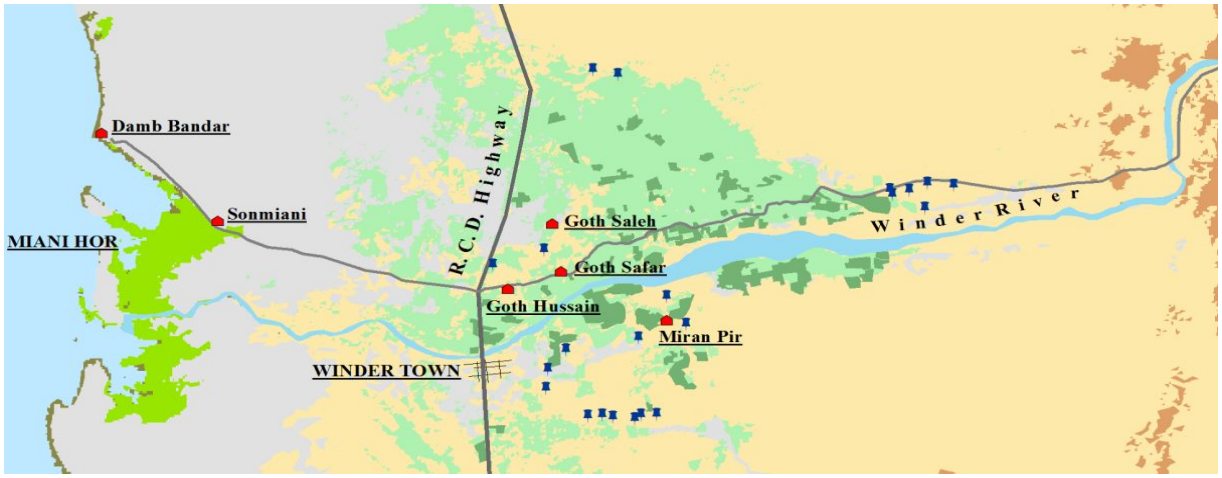

Fig. 2. Land-use Classification of winder Basin.

Fig. 3A

Fig. 3B

Fig. 4

Fig. 5A

Fig. 5B

Fig. 5C

Table 1. Outlay and profit of different fruits.

	Sapodilla	**Guava**	**Papaya**
Total land under fruit farm(acre)	200	200	4
Number of trees	30	50	750
Production period (months)	6	6	4 years total life
Labor engaged	8	12	11
Labor salary per month (Rs.)	3000	3500	3500
DAP per bag (Rs.)	1300	1300	1300
Urea per bag (Rs.)	600	600	600
Seed per bag (Rs.)	1100	1100	1100
Irrigation expenses (Rs.)	500	400	1000
Labor expenses (Rs.)	1090	6000	9625
Total DAP used (Rs.)	1300	1300	2600
Total Urea used (Rs.)	600	600	600
Total fertilizer used (Rs.)	1900	3200	3200
Total Seed used (Rs.)	1100	1100	1100
Transportation cost (Rs.)	1100	5200	2000
Total Input (Rs.) (a)	**8,190**	**20,500**	**16925**
Production (bags) (Rs.)	90	130	280 (boxes)
Price per bag (Rs.)	500	600	200
Price of total production (Rs.) (b)	**4,500**	**78,000**	**56,000**
Return (Rs.) (a-b)	**37110**	**57500**	**39075**

Based on field survey conducted 2009-10

iii- Rangeland: Livestock is a sub-sector of agriculture and plays an important role in the economy of Balochistan. More than 20 percent of provincial income is generated by this sector (Haque, 2007). This is the basic dominant economic activity in the rural society of Lasbela plain. It covers the largest part of the land for agriculture. The Porali basin is a very productive area for grazing activity (5A) and more than half of the land is used as rangeland (Mahar *et al*, 2013). Grazing of herded livestock was commonly observed during the survey. Herders mostly used to graze their animals in the proximity of irrigated land and simultaneously perform their work in fields (Fig. 5ABC).

Sustainable rangeland management is an important economic issue not only in semi-arid areas but also in sub-tropical regions. For optimum utilization and protection of natural resources, spatial information on the current state and grazing intensity are required (Kurtz *et al*, 2009). Lasbela has a great potential to develop its vast coastal area and rangelands to increase the overall agriculture productivity.

A substantial amount of poultry farms are also found at the fringes of agricultural land, which is considered as an additional activity along farming and animal husbandry.

Conclusion

Pakistan is basically an agricultural country. Although, agricultural productivity of the country has increased since 1960s, still it is not succeeded in meeting the demand of the rapid growing population. Winder basin of Makran coast is potentially a very productive area. The cultivation of land is made possible by introducing tube well irrigation. Besides crop cultivation fruit farming is also a prominent feature of agriculture in Winder basin. The rangeland of the area is being served for animal grazing which is phenomenally significant. Traditionally, this area has always been cultivated either by rain water or by animal operated wells. The present hydrological condition of the area does not permit to continue the traditional way because of being low water table. To overcome this problem the Government of Balochistan has provided electricity at subsidized rate for electric pumping machine which is a highly appreciated incentive for promoting agriculture. The

subsidy of the government has eliminated this additional economic burden in the utilization of water for irrigation that is the main factor in increasing the cultivated area. Field observation further infers that the cultivated area will be increased in future by replacing the rangeland.

Recommendations

- In addition to the irrigation network of the Indus River System in the plains of Pakistan, many drainage basins exist in the upland and plateau area should also be carefully managed to improve agriculture production.
- Hydrological surveys of the study area are recommended to identify the aquifer channels and recharge of the groundwater.
- Proper embankments are needed to store Winder drainage.
- Linking roads (field to market) must be constructed for the development of the area. Further the part of RCD highway which connects Karachi to Winder must be improved to make transportation easier and more fluent.
- Seeds and fertilizers should be subsidized to the farmers to enhance their yields.
- Agro forestry should also be introduced on various patches of farms.
- Catchment area of Winder river should be manage properly which can also be used as rangeland.

References

Ahmed, R. and Mahmood, K. (2007). Process of Development and Future Prospects: A Geographical Analysis of Balochistan Province. *Pakistan Geographical Review* 62(1): 15-30.

Ahsanullah. (1971). Report on Landform and Drainage Basins in Karachi Region. Master Plan for Karachi Metropolitan Region, Karachi Development Authority, Karachi.

Ali, S.S. (2005). Mountain Agriculture in Pakistan: Crop Combination and Food Sustainability. *Journal Geographic* 10: 47-56.

Alizai, M.Y. (1998). Unused Agricultural Land of Pakistan and its Spatial Distribution. Studies in Pakistan Geography, edited by Israr-ud-Din, Department of Geography, Urban and Regional Planning, University of Peshawar, Peshawar.

C.I.A. (2012). World Fact book. Central Intelligence Agency, Office of Public Affairs, Washington D.C. 20505. Online available: https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html#top.

GoB. (1998). Development Statistics of Balochistan 1998-99. Bureau of Statistics, Planning and Development, Government of Balochistan, Quetta.

GoP. (2011). Pakistan Statistical Year Book 2011. Statistical Division, Federal Bureau of Statistics, Islamabad.

GoP. (2011-2012). Pakistan Economic Survey 2011-2012. Finance Division, Economic Adviser's Wing, Islamabad.

Haider, S.F. (2007). Irrigation Schemes for Balochistan. Economic and Business Review, The Daily Dawn, February 5: III.

Haque, I. (2007). Plan to Revamp Balochistan's Agriculture System. The Daily Dawn, Economic and Business Review, March 19:V.

Jhorar, R.K., Smit, A.A.M.F.R. and Roest, C.W.J (2009). Assessment of Alternative Water Management Options for Irrigated Agriculture. Agriculture Water Management. 96(6): 975-981.

Khan, F.K. and Dhanani, M.R. (1998). The Role of 'Reported' Cultivated Area in Green Revolution in Pakistan. Studies in Pakistan Geography, edited by Israr-ud-Din, Department of Geography, Urban and Regional Planning, University of Peshawar, Peshawar.

Khan, J.A. (1993). The Climate of Pakistan. Rehber Publishers, Karachi.

Kurtz, G.B., Schellburg, J. and Braun, M. (2009). Ground and Satellite Based Assessment of Rangeland Management in Sub-tropical Argentina. *Applied Geography* XXX: 1-11.

Li, X., Peterson, J., Liu, G. and Qian, L. (2001). Assessing Regional Sustainability: The Case of Land Use and Land Cover in the Middle Yiluo Catchment of the Yellow River Basin, China. *Applied Geography* 21: 87-106.

Mahar, G.A., Ahmed, R. and Iqbal, M.J. (2013). Temporal Change Assessment of Agricultural Land by Satellite Remote Sensing (SRS) Technique. Natural Science 5(6): 689-694.

Pakistan (2012). Connecting Agriculture for Better Farming. In: Pakistan agriculture overview. Available online: http://www.pakissan.com/english/agri.overview/index.shtml.

Spate, O.H.K. (1956). India and Pakistan. Methuen, London.