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# BERENJ "RICE" II. IN AFGHANISTAN

ii. In Afghanistan

In Afghanistan rice cultivation (paddy: Pers. *šālī*, Pashto *šāləy*, *šōlī; hulled rice: Pers. berenj, Pashto wrījī/wrīžī) is relatively more important than in Iran, accounting for 5-6 percent of the cultivated land (213,000 hectares in 1362 Š./1983), which makes it the fourth-ranking crop, after wheat, corn, and barley.*

As no recent regional breakdown of production figures is available (see Krochmal, p. 186, for the years 1952-54), geographical analysis of rice growing in Afghanistan can be based only on figures for land planted in 1966, as recorded in the agricultural census of 1346 Š./1967 (Figure 15). These figures reveal extreme regional contrasts, which are determined by two types of ecological factors:

First, the temperature requirements for rice limit its cultivation strictly to regions of low or medium altitude. The maximum upper limit is 2,500 meters in the Solaymān mountains (Rathjens, p. 301) and seems to lie no higher than 2,000 meters in the Afghan Hindu Kush (Grötzbach, 1972a, p. 159), although rice fields have been observed at 2,300 meters in neighboring Chitral (Nagel, p. 136). Of all the grains cultivated in Afghanistan, rice is, then, the one that most quickly disappears at high altitudes.

Second, rice requires constantly wet soil throughout its growing period;

cultivation thus depends upon summer irrigation. That is why the lowlands where the waters from the Hindu Kush converge are the only ones where more than 10 percent of the arable land can be devoted to rice: 17 percent in the middle Kābolrūd basin (Laḡmān, Nangrahār, and the lower Konar valley, 25,700 hectares in 1966) and 12 percent in Qaṭaḡan as a whole (75,400 hectares)—though as high as 15 percent in Qondūz province (37,800 hectares), where the Ḵānābād district is the main national area of production. These regions, the only ones that enjoy large and consistent surpluses, are the real rice basket of the country. Already at the beginning of the 12th/19th century Laḡmān supplied the Afghan court with rice (Strachey), and in 1967-68 about thirty local wholesalers controlled exports on the order of 4,500 tons a year (Hendrikson, p. 45). As for Qondūz and Baḡlān provinces, 42 percent of their production was marketed in 1972 (*Afghan Agriculture in Figures*, p. 63).

In the Paktīā, which is rich in springs and favored by tropical rains in summer, about 8 percent of the cultivated land (5,400 hectares in 1966) can be devoted to rice, especially in the Ḵōst basin and the northern valleys of the Solaymān mountains (the Jājī country and the Čamkanī basin). Production there fluctuates greatly, however, because of the unreliability of the monsoon (Wald, pp. 32f.). In 1970-71 rice fields occupied no more than 4 percent of the cultivated land (Osterkamp, p. 19).

Everywhere else rice growing is much more marginal, accounting for less than 4 percent of the cultivated area in 1966 (a total of 99,100 hectares). For all practical purposes it is absent from oases supplied by *kārēz/kārīz* (subterranean channel; see qanāt) and concentrated in narrow zones that are well watered by streams, like the oases of the Bactrian piedmont alluvial fans; the valleys of the Harīrūd and Farāhrūd; the Qandahār oasis; and the valleys of the Lōgar, upper Kābolrūd, and Panjšīr. As a general rule, the importance of rice (and of summer cereal crops in general) in those areas decreases the farther downriver the land is located. This pattern is particularly striking along the Lōgar valley, where the rice-producing Wardak contrasts with Lōgar proper farther downstream. Some production centers that are secondary today seem to have been exporters in the past: for example, Herat and Balḵ in the Middle Ages (see the references gathered by Canard, p. 118; and Miquel, p. 405) and Maymana in the 12th/19th century (Aitchison, p. 146). Today only Wardak still produces regular surpluses, which are sent to Kabul.

The unreliability of the statistics renders the contemporary dynamics of rice growing in Afghanistan difficult to grasp. On a national scale it seems that rice

lands have increased but slightly (reaching 200,000 hectares as early as 1956), while a spectacular rise in production has been recorded: from 300,000 tons in 1956 to 480,000 tons in 1983. The threshold of 400,000 tons was crossed in 1968, and since then production has not dropped below it, except during the two drought years of 1970-71. In a quarter-century the average yield has thus risen from 15 to more than 22 quintals per hectare. In reality, at this level of analysis, too, regional differences are considerable.

It is in Qaṭaḡan that the most profound changes have occurred. The vigorous encouragement that the Afghan state gave to cotton and sugar-beet cultivation there after 1935-40 led to a decline in traditional summer crops, the most important of which was rice. In the less richly watered zones rice growing was even forbidden outright in order not to divert irrigation water from the new industrial crops (see Grötzbach, 1972b, p. 383, for a specific example near Tālaqān). Elsewhere the peasants reacted to forced reduction of their rice fields by farming them more intensively. They thus adopted the previously unused method of transplanting. Although this system heightened the demand for seasonal labor, a spectacular increase in yields did result, reaching maximums of more than 35 quintals per hectare (Grötzbach, 1972a, p. 159). At the same time, a steady rise in retail prices stimulated rice growing in regions far away from the zones of government intervention, particularly in the well-watered main valleys of the northern slopes of the Hindu Kush: The Andarāb, Ḵōst, and Fereng valleys thus became major production areas, where the old communal rules for crop rotation have been weakened by expansion of the rice fields (Grötzbach, 1970, p. 38; 1972a, pp. 167ff.). In recent decades rice growing has spread even to the upper Warsaj valley. The entire Qaṭaḡan has thus experienced a tremendous alteration in the geographical distribution of rice growing.

In comparison, all other producing regions have exhibited great stability. The only notable changes have been technological. Transplanting, which was already practiced south of the Hindu Kush at the beginning of the twentieth century (Vavilov and Bukinich, 1929, pp. 104, 309), has gained ground, especially in Paktīā, where, while absent from the Jājī country in the last century (Bellew, p. 126), it is now known though not always practiced. However, the spread of transplanting remains far from complete: in the Lōgar valley and in the western part of the Ḵōst basin, for example, it is totally unknown (Wald, p. 40). More significantly, the efforts devoted to diffusion of chemical fertilizers and above all the introduction of improved varieties of

rice like IR 8, which was developed after 1966 at the Šīšam Bāḡ experimental station at Jalālābād, permitted the doubling of yields: whereas traditional local varieties yield 12 quintals per hectare, on the average, the yield is 25 quintals per hectare for improved varieties, which, however, involve the dual inconvenience of a longer growing cycle and less appeal to consumers (Sanyu Consultants, III, annex 6, p. 14). As the lack of irrigation water is clearly the major factor limiting rice cultivation, it seems paradoxical that the recent expansion of irrigated lands in southern Afghanistan has not resulted in an increase in rice fields. In the Helmand region (q.v.), where rice growing had been spontaneously introduced by the first settlers, it was actually quickly forbidden because of its water requirements, which were judged exorbitant in relation to what was available, and the risk of waterlogging, with the concomitant danger of malaria (Stevens and Tarzi, p. 100). The same health argument had already been used to justify a ban on all rice growing around Kabul (Humlum, p. 172).

All these examples show clearly how modern state interventionism combines with the complex of natural constraints to explain geographical contrasts in Afghan rice cultivation.

The range of rice varieties traditionally grown in Afghanistan is very broad: fourteen different varieties were identified by Vavilov and Bukinich (pp. 311ff.), and the actual number is probably higher. Commonly designated by their supposed place of origin, which can be foreign (for example, the *pēšāwarī* and *dēra-dūnī* varieties), they can all in fact be classified in two major subdivisions, distinguished in Afghanistan by their appearance, their eating qualities, and their price; the last commonly varies as much as 20 or 30 percent and sometimes more.

Long-grain varieties (Pers. *berenj-e bārīk* or *berenj-e mahīn/maʾīn*, Pashto *narəy wrījī*), of which there are three, are characterized by broad leaves and a slender, whitish kernel about 7 mm long. These varieties are the most valued, for the grains separate nicely in cooking. They are also those that require the most water and the highest temperatures to grow. They are found only below 1,000 meters, in Qaṭaḡan and between Laḡmān and Konar. Today they are almost always transplanted. Long-grain rice is mainly a cash crop and brings the highest returns of any agricultural crop except grapes. At Kabul there is a slight market preference for *berenj-e bārīk-e laḡmānī* over *berenj-e bārīk-e baḡlānī*, and the former sells for a correspondingly higher price.

Short-grain rice (Pers. *berenj-e lok*, Pashto *ḡaṭ wrījī*, also *pənḍī wrījī*) includes eleven botanical varieties, all having narrower leaves and a brownish, ovoid kernel 5-5.5 mm long. These varieties are much hardier and thus much more widespread than the long-grain types; they are the only ones to be cultivated at higher altitudes . They are also less prized, for in cooking they yield a sticky mass. They are generally not transplanted. At Kabul *berenj-e lok-e wardakī* is preferred to *berenj-e lok-e dōšī* from the Hindu Kush.

As in Iran, in Afghanistan rice is always a summer irrigated crop. Within these limits it nevertheless fits into a variety of cropping systems, all based on cereals. The most intensive is the annual rotation of winter wheat and rice, which is possible only at low altitudes and is particularly characteristic of the Nangrahār and the northeastern part of Qaṭaḡan around Ḵānābād and, to a lesser extent, Tālaqān. The paddy is sown in May or the beginning of June in a nursery (Pers. *qōrīa*, Pashto *bozḡalay* or *būzḡəlay*), often previously spread with green fertilizer (freshly cut clover). Transplanting (Pers. and Pashto *nehālī/nīālī*) takes place about forty days later (June-July), which allows the time necessary to prepare the fields after the wheat harvest; this preparation involves plowing two or three times in criss-cross fashion, applying fertilizer, harrowing first with a spike harrow (*rākōl*) and then with a board (*māla*), and finally rebuilding the low earth banks (*pōlwan*) around the fields. The harvest takes place four to four and a half months later (September-October; Lévêque, pp. 107ff.). This system of producing two annual crops without fallowing, which seems relatively old in Nangrahār, has been introduced only recently in the eastern Qaṭaḡan, where adoption of transplanting in the years between 1940 and 1950 made it possible to replace the traditional rotation between single crops of wheat and rice in alternate years separated by a long fallow period (Grötzbach, 1972a, p. 165). Naturally such an intensive cropping system is one that quickly exhausts the soil. That is why it is frequently supplemented by the introduction of a soil-restoring crop, usually winter clover, which can be plowed under just before the transplanting of the rice. A two-year rotation cycle—wheat, rice, clover, rice—can thus be obtained, whereas the more exhausted lands can support only a much less productive annual rotation between clover and rice or an even longer cycle involving successively wheat, corn, a winter fallow period, and rice, which yields only three crops in two years (Gul and Pickett, p. 28; Toepfer, p. 30; Michel, p. 37). There is thus a hierarchy of intensiveness in cultivation at low altitudes, depending on the richness of the rice fields and the availability of water.

At higher altitudes the crop systems are markedly less intensive. Although a biennial rotation of wheat, corn, clover (or barley), and rice does occur in the Jājī country (Paktīā), at these altitudes a triennial rotation of annual crops following the sequence wheat, rice, corn or two successive years of wheat alternating with rice is more common, whereas on more marginal rice-growing lands the predominating pattern is wheat, rice, and a one-year fallow period (two crops in three years). Often enough a between-seasons crop of clover follows wheat but rarely rice. The latter is in fact frequently succeeded by a winter fallow season, either because water is lacking in autumn to loosen the earth of the rice fields, which has been compacted under long submersion, so that it can be plowed or because there is too little time after a late rice harvest to carry out the preparations for planting before winter sets in.

Finally, at all altitudes there are some places where rice is the sole crop. They include particularly wet fields, notably in the marshy lowlands, which are permanently planted in rice.

Whatever the crop rotation, the rice field must be kept wet during the entire growing period. It is flooded before planting and is kept submerged by daily irrigation as long as possible. In summer, however, irrigation frequently can take place only once in every three to twenty days, depending on the availability of water, and the crop may then suffer from water shortage. The final draining of the rice fields usually occurs five to ten days before harvesting.

Hand weeding and pest control are uncommon. Weeds indeed pose a very serious problem, as they can greatly reduce yields (Mortensen et al.). The most common pests are stem borers (*Tryporyza* spp.) and, at harvest time, birds. The birds are frightened away by beating on pans, snapping grass whips, firing shotguns, or erecting scarecrows (Pers. *jāl*), none of which is very efficient. Rodents can also do great damage at times when the fields are not submerged.

Harvesting is accomplished by scything, the stems being cut at ground level. The straw is quickly separated under the hooves of animals on a floor of tamped earth (*ḵerman-jā*). Rice straw, mixed with straw from other cereals, is used as winter forage. As for the grain, after threshing and winnowing, it must still be hulled before it can be eaten.

Everywhere in Afghanistan the hulling of paddy has remained a cottage

operation. No mechanized rice factory exists in the country. The methods used vary markedly from one district to another, depending partly on the importance of rice growing and partly on the type of rice grown.

In the large production areas specialized entrepreneurs own small rice mills. The equipment consists of a single, or more often a double, hydraulic pestle (*awjowāz* or, more commonly, *pāykōb*, from *pay*, “pestle”; Ferdinand, pp. 201ff., 224ff., for the description; Humlum, pp. 318ff., for illustrations). The yield ratio at such mills is about 5:8 (8 kg of paddy yielding 5 kg of hulled rice). The miller charges for his service a payment in kind that is customarily equivalent to 1/25 of the hulled rice.

In the middle Konar valley a more archaic rice mill, consisting of a simple foot-operated pestle, has been described (Vavilov and Bukinich, pp. 204f.). In regions where rice production is marginal and entirely consumed locally, hulling is an individual operation that each producer performs at home by means of a rotary quern of baked clay (*jandalī*, Ferdinand, pp. 213, 226, for the Lōgar valley) or a simple stone or metal mortar (*jowāz-e dastī; Vavilov and Bukinich, p. 204, for the Herat oasis).*

Hulling of long-grain rice is always preceded by a light roasting, which is intended to harden the grains and limit the losses through breakage during hulling but which has the beneficial side effects of improving the flavor of the rice, shortening the necessary cooking time, and ensuring better resistance to parasitic insects. This roasting is quite a long and complex operation, which is always carried out at home. Several different methods are used. The most common consists of roasting in contact with sand that has previously been heated to a high temperature in a special beehive-shaped oven lined with clay (Laḡmān) or in a great metal cauldron (*dēg; Qaṭaḡan); the mixture must be sifted after roasting to separate the sand, which is reused, from the paddy. But there are also instances of roasting simply by grilling the paddy, especially in Qaṭaḡan. Another variant method is to parboil the paddy, sometimes before roasting (Laḡmān), sometimes after (Qaṭaḡan). In the latter instance the paddy is then dried in the sun. Furthermore, it seems that, in contrast to the practice in Laḡmān, in the Qaṭaḡan parboiling the paddy is less common than simply soaking it in cold water after roasting (on these methods, see the two complementary studies of Lévêque, p. 111, and Ferdinand, pp. 201ff., 224ff.).*

In the major growing regions the entire processing of the rice, from harvesting through hulling, requires seasonal hand labor. In the Laḡmān the latter is

traditionally hired from specific ethnic groups with hereditary specialized professional status: the Ebrāḥīmḵēl, the Hazārmēšī, and especially the Ḥosaynḵēl. These seminomadic groups live in the villages of the Laḡmān as *hamsāya* (clients). They round out their winter employment on the rice by participating in the harvesting, threshing, and winnowing of wheat, in late spring in Laḡmān and in summer around Kabul. They are paid in kind, usually receiving between one tenth and one seventh of the hulled rice. The Mosal(l)ī, a comparable seminomadic group, originally distinct from the preceding groups but gradually becoming less so, traditionally had a monopoly on rice cleaning at the mill, which consists of removing the hulls and the dust from the rice after the hulling process (Olesen). In a labor market that is growing more and more crowded and thus more competitive, however, these professional monopolies are tending gradually to disappear, and landless peasants, regardless of ethnic origin, are now participating in the complex work chain that follows the rice harvest. Nevertheless enough vestiges of the old tradition remain so that it is possible to recognize an organization of work very similar to the Indian caste system. Combined with the fact that parboiling the paddy is a specifically Indian technique and that roasting in sand is widely attested on the Indian subcontinent, it suggests that Afghan rice cultivation has been very much influenced by the Indian cultural sphere. Indeed the only distinctive feature of Afghanistan in this respect, one that it shares with northwestern Pakistan (Swat), is the use of the hydraulic rice mill, which is totally unknown in India. It should perhaps be recognized as a Central Asian invention that appeared at the meeting point between two great technological traditions, the Middle Eastern tradition of the water mill with horizontal driving wheel for wheat and the possibly Chinese invention of the rice pounder worked by foot pedal (Ferdinand, pp. 214ff., 227ff.).

Once hulled, the rice is ready for eating. There is no region of Afghanistan where it is not consumed. Because of its relatively high price, however, it is a luxury. Even in the great rice-growing regions wheat bread is the dietary staple, rice being served only on festive occasions. Rice consumption is still rarer in nonproducing regions. At any rate, only the middle and upper strata of society eat it regularly, and upward social mobility is always reflected in an increase in rice consumption. The rice trade is overrepresented in the large cities, where a specialized market is often reserved for it: at Kabul the number of rice merchants (*berenj-forūš*) registered by the municipal service rose to 304 in 1982 (*Rahnamā-ye šahr-e Kābol*, p. 82), a great increase over the number in 1973 (132, according to Haider, table facing p. 196). At the beginning of the

1970s eighty-eight were counted at Qandahār (Wiebe, 1978, p. 280), twenty-seven at Ḵolm (Charpentier, p. 70), and twenty-five at Sar-e Pol (Centlivres, 1976, table facing p. 133) respectively but only three each at Gerešk and Laškargāh, two each at Kalāt-e Ḡelzay (Wiebe, 1978, p. 284) and Āqča (Wiebe, 1981, p. 159), and none in small towns like Andḵōy or Spīnbōldak. It should be added that that part of the trade in rice in northern Afghanistan and in the Kōhdāman takes place in weekly markets (there were twelve specialized merchants in the great market of Qezel Ayāq-e Kalān, northwest of Šeberḡān, in 1976-77, according to Fischer, p. 212).

According to official statistics on foreign trade, Afghanistan does not export rice and imports it only occasionally: for example, 3,000 tons were imported from Japan in 1350 Š./1971-72, a year of severe famine, in which national production dropped to 350,000 tons. It is customary to conclude from these figures that the country is self-sufficient in normal years. This is, however, to overlook the existence of a noteworthy clandestine traffic in rice imports from Pakistan. For the Qandahār market alone it has been estimated that 26,500 tons were thus imported in 1971, admittedly an exceptional year; part of it was forwarded to Herat (Ata and Shah).

The methods of preparation and consumption of rice in Afghanistan are quite varied and differ for long-grain and short-grain rice.

Long-grain rice is considered a “hot” food in the Hippocratic classification of foods that is current in Afghanistan (Centlivres, 1985, pp. 42ff., 46). It is limited to preparation of *čelow/čalaw* (white rice boiled in water) and *palaw* (Pers. *polow*, rice cooked with meat, onions, caramelized sugar, and saffron or turmeric). The former is the more common dish, the latter being prepared only on special festive occasions. Two different methods of cooking are known: the rice is either simply boiled in water (*dampoḵt-e berenj*), or it is first parboiled, drained, and then boiled again in either fresh water or stock (*ṣāf-berenj*). Either way it is usually served with vegetables and a meat stew (*qōrma*) or meatballs (*kōfta*). There is a great variety of such dishes, which usually take their names from the accompaniment (*bādenjān/bānjān-palaw* or *čalaw* [Pers. *čelow*] with eggplant; *māš palaw* with mung beans and apricots; *narenj-palaw* with orange peel, which is one of the tastiest; *rešta-palaw* with fine egg noodles like vermicelli) or from the color of the rice (*yāqūt palaw*, made with tomatoes, *zomorrod* [or *sabzī*]-*palaw* or *čalaw* with spinach, *zarda-palaw* with nuts and saffron).

Short-grain rice, which is considered a "cold" food, is used for quite different dishes, like *batta* (rice boiled in water and served with eggplant or other vegetables), *šōla* (rice cooked with meat and pulses), and *kečrī-q(o)rūt* (a very popular dish of rice cooked with mung beans and served with *q(o)rūt*, which is dried and salted buttermilk or yogurt reconstituted with water). There are also a variety of rice puddings (*šīr-berenj*, *dēġča*) and other rice desserts (like *šōla šīrīn*, sweet rice with nuts; *šōla-ye (ḥ)olba*, sweet rice with fenugreek; and *ḥalwā-ye ārd-e berenj*, creamed rice pudding; all these dishes are described at length in Saberi).

# BIBLIOGRAPHY

*Afghan Agriculture in Figures*, Kabul, 1978.

J. E. T. Aitchison, *Notes on the Products of Western Afghanistan and of North-Eastern Persia*, Edinburgh, 1890.

A. Ata and L. Shah, *Kandahar Trip Report* (unpublished), 1971.

M. Canard, "Le riz dans le Proche-Orient aux premiers siècles de l'Islam," *Arabica* 6, 1959, pp. 113-31.

P. Centlivres, "Structure et évolution des bazars du Nord afghan," in *Aktuelle Probleme der Regionalentwicklung und Stadtgeographie Afghanistans*, ed. E. Grötzbach, Afghanische Studien 14, Meisenheim am Glan, 1976, pp. 119-45.

Idem, "Hippocrate dans la cuisine: Le chaud et le froid en Afghanistan du Nord," *Identité alimentaire et altérité culturelle*, Travaux de l'Institut d'ethnologie 6, Neuchâtel, 1985, pp. 35-57.

C.-J. Charpentier, *Bazaar-e Tashqurghan: Ethnographical Studies in an Afghan Traditional Bazaar*, Studia Ethnographica Upsaliensia 36, Uppsala, 1972.

A. D. Davydov, *Sotsial'no-èkonomicheskaya struktura derevni Afganistana*, Moscow, 1976.

K. Ferdinand, “Ris. Træk af dens dyrkning og behandling i Østafghanistan,” *Kuml* (Århus) 9, 1959, pp. 195-232 (with detailed Eng. summary).

W. Fischer, *Periodische Märkte im Vorderen Orient dargestellt an Beispielen aus Nordostanatolien (Türkei) und Nordafghanistan*, Mitteilungen des Deutschen Orient-Instituts 24, Hamburg, 1984.

E. Grötzbach, “Formen des zelgengebundenen Feldbaus und dessen Auflösungserscheinungen im Hindukusch (Nordost-Afghanistan),” *Die Erde* 101, 1970, pp. 23-40.

Idem, *Kulturgeographischer Wandel in Nordost-Afghanistan seit dem 19, Jahrhundert*, Afghanische Studien 4, Meisenheim am Glan, 1972a.

Idem, “Staatliche Agrarpolitik und Bodennutzungsgefüge in Nord-ost Afghanistan,” in *Deutscher Geographentag Erlangen-Nürnberg 1971: Tagungsbericht und wissenschaftliche Abhandlungen*, Wiesbaden, 1972b, pp. 380-89.

A. Gul and L. Pickett, *An Agronomic Survey in Six Eastern Provinces of Afghanistan* (multigraphed), Kabul, Faculty of Agriculture, n.d.

H. Haider, *Contribution à l’étude de la commercialisation des produits agricoles en Afghanistan*, doctoral thesis, University of Paris-Sorbonne, 1976.

K. Hendrikson, *Reconnaissance Study for the Regional Development in the Province of Laghman/Afghanistan* (multigraphed), Kabul, 1968.

J. Humlum, *La géographie de l’Afghanistan*, Copenhagen, 1959.

A. Krochmal, “Rice Production in Afghanistan,” *Economic Botany* 12/2, 1958, pp. 186-91.

L. A. Lévêque, “Notes sur la riziculture en Afghanistan,” *Riz et riziculture* 4, 1958, pp. 105-12.

A. A. Michel, *The Kabul, Kunduz and Helmand Valleys and the National Economy of Afghanistan*, Ph.D. thesis, Columbia University, New York, 1959.

A. Miquel, *La géographie humaine du monde musulman jusqu’au milieu du 11$^{e}$ siècle*, Civilisations et sociétés 68/3, Paris and the Hague, 1980.

E. Mortensen et al., *Review of Rice Research Conducted at Shisham Bagh Experiment Station, Jalalabad (1966-68)* (multigraphed), USAID, Kabul, n.d.

E. H. Nagel, "Der Reisbau bei den Kho in Chitral," in *VergleichendeKulturgeographie der Hochgebirge des südlichen Asien*, ed. C. Rathjens et al., Erdwissenschaftliche Forschung 5, Wiesbaden, 1973, pp. 129-40.

A. Olesen, "The Musallis—the Graincleaners of East Afghanistan," *Afghanistan Journal* 9/1, 1982, pp. 13-19.

H. Osterkamp, *Landwirtschaftliche Produktionstruktur*, Grundlagen und Empfehlungen für eine Perspektivplanung zum regionalen Entwicklungsvorhaben Paktia/Afghanistan 7/3, Düsseldorf, 1972.

*Rahnamā-ye šahr-e Kābol*, Kabul, 1362 Š./1983.

C. Rathjens, "Die Wälder von Nuristan und Paktia," *Geographische Zeitschrift* 62/4, 1974, pp. 295-311.

H. Saberi, *Noshe Djan. Afghan Food and Cookery*, London, 1986.

Sanyu Consultants, *Draft Feasibility Report for Kama Irrigation Project in Afghanistan*, Nagoya, 1973.

I. M. Stevens and K. Tarzi, *Economics of Agricultural Production in Helmand Valley*, Denver, 1965.

R. *Strachey, Memoir on the Revenue and Trade of the Kingdom of Caubul*, ms., India Office Records, London.

H. Toepfer, *Wirtschafts- und sozialgeographische Fallstudien in ländlichen Gebieten Afghanistans*, Bonner Geographische Abhandlungen 46, Bonn, 1972.

N. I. Vavilov and D. D. Bukinich, *Zemledel'cheskiĭ Afganistan*, Leningrad, 1929.

H.-J. Wald, *Landnutzung and Siedlung der Pashtunen im Becken van Khost*, Schriften des Deutschen Orient-Instituts, Materialien und Dokumente, Opladen, 1969.

D. Wibe, *Stadtstruktur und kulturgeographischer Wandel in Kandahar und Südafghanistan*, Kieler Geographische Schriften 48, Kiel, 1978.

Idem, “Probleme stadtgeographischer Forschung in Afghanistan—Wandel und Beharrung afghanischer Provinzstädte,” in C. Rathjens, ed., *Neue Forschungen in Afghanistan*, Schriften des Deutschen Orient-Instituts, Opladen, 1991, pp. 149-62.

Zmaryālay, “Də wrīǰō kəšt aw maṣraf pə Afḡānestān kē,” *Majalla-ye eqteṣād* 236-37, 1320 Š./1941, pp. 745-49.