

WORK AND NUTRITION IN HIGH ASIA

Theoretical Framework, Methods and Main Results of a Comprehensive Study on the Production-Reproduction-System in Northern Pakistan¹

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Research on nutrition has a long tradition in geography. At present, problems concerning food and nutritional security in developing countries are particularly topical.² Yet, such research with reference to high mountain cultures in the so-called Third World is lacking. This deficiency provided the impetus to undertake such a study in Northern Pakistan. However, during field work it soon became obvious that the economic and social activities of the local people are not exclusively dedicated to securing food and nutrition. Rather, their endeavours are part of a wider concept of reproduction.

Work and nutrition as basic links between production and reproduction

In this paper reproduction is defined as the maintenance and restoration of human life and the human capacity to work. The term can further be divided into generative and regenerative reproduction. The first term refers to human propagation (sexuality, birth etc.), upbringing, education and socialization of children; the latter to nutrition, clothing, habitat, health and the psycho-social care of all age groups. Hence, generative reproduction relates primarily to human development before the individual enters working life, whereas regenerative reproduction refers to the daily care and maintenance of people during their whole life span (Edholm, Harris & Young 1977; Elwert 1985; Kitschelt 1987; Harris 1989). The main institution which is responsible for reproduction is the domestic unit. However, this unit is a part of a larger social network and always interacts with other institutions (e.g. public school, development agencies) which also contribute to the reproduction of individuals as well as of the society as a whole (Evers & Schiel 1981; Elwert 1983; Räder 1993).

Reproduction is closely connected with production, a fact already emphasised by K. Marx and F. Engels (Engels 1892; Marx & Engels 1932; Beetz 1989). In capitalist societies, this relationship has to be established

over labour and commodity markets. In non- (or less-) capitalist societies, by contrast, the linkage is much stronger. Economic returns which are not necessary for subsequent productive steps (e.g. seeds) are consumed and thereby utilised for reproduction.

On the household level this process exhibits the following pattern: People either produce raw plant and animal materials themselves or they buy these products from the market with money earned in different income sectors. After being processed, foods and other goods are consumed by household members primarily in order to meet nutritional needs. If the supplies suffice, the physical maintenance of the individuals concerned is secured. Consequently, the working population will be able to continue their productive and reproductive activities, thus keeping up the perennial cycle of production and reproduction.

It is evident that work and nutrition are the main links between production and reproduction; the yields of one are the requisite of the other. Deficits or disturbances anywhere in this process inevitably have negative consequences for subsequent steps. For instance, long-term inadequate nutrition impedes reproduction. In this case, the working ability of the people affected might be reduced, which hinders them in their efforts to perform productive and reproductive tasks.

In developing countries, production and reproduction occur under specific conditions. The majority of people utilise a variety of income sources in an effort to provide the household with food and goods. Subsistence agriculture and the reciprocal exchange of goods between relatives and neighbours play a major, but not necessarily predominant role. In many parts of developing countries, as in Northern Pakistan, most peasants possess land holdings too small to be self-sufficient. Thus, they have to earn an additional income by wage employment or marketing local commodities. However, low wages and low prices for local products result in a situation in which the cost of reproduction cannot be met through these sources alone. Thus, a large number of households are *combined subsistence-labourer-families* (Evers & Schiel 1981: 322), i.e. they can neither sustain themselves exclusively from their land, nor can they subsist without it. Hence, the costs of reproduction have to be met in part by subsistence production and reproductive services performed by non paid household members, particularly of the female sex. The rearing of children and housework are typical tasks which women perform without any pay.

¹ For the full presentation of the findings, see Herbers 1998.

² See Bohle 1993; Bohle et al. 1991, 1993; Chambers 1983; Maxwell 1990; Sen 1981; Watts & Bohle 1993; Wisner 1993.

Nevertheless, their contribution to production and reproduction is usually undervalued, because work is generally evaluated in terms of money instead of the work load and time spent in its execution. Despite their multisectoral engagement, many peasants' households cannot meet the basic needs of their members and thus live on a very low reproductive level (Elwert & Wong 1981; Elwert 1983, 1985; Evers 1987).

Methods and measures to estimate workload and nutritional status

Research on the production-reproduction-system has mainly been dealing with questions concerning production, mostly ignoring the area of reproduction. Work and nutrition in particular — the crucial links between these two spheres — are rarely included in analyses. Thus, a research project was initiated to focus on these two aspects in order to partially fill this gap. The high mountain valley of Yasin in the most northern section of Pakistan was selected as study site because subsistence production and wage labour — and hence production and reproduction — are still interdependent here. Work and nutrition were examined under these conditions on a microlevel, i.e. on the level of households and individuals. Due to the fact that this study was carried out by a female geographer (and nutritionist), it also gives insight into the women's sphere in an Islamic society — a sphere generally inaccessible to men, be it natives or researchers.

The data was collected during some 20 months (September 1991 - December 1992 and August 1993 - December 1993) of field work. Due to the lack of a public transport system, investigations were concentrated on the villages of Sandi and Barkulti, both located in the centre of the valley. To gather basic information on the socio-cultural, historical and political background of the area, open interviews with local representatives were conducted. Questionnaires were filled out with reference to 41 households so that the degree of self-sufficiency and the dependency on the markets could be estimated; a food balance sheet was also drawn up from this data. Moreover, 146 time-allocation-studies were carried out to highlight the organisation and division of work within and between households. For this purpose, the interview-partners had to describe all activities performed on the previous day. This data allowed for a calculation of the workload of each individual expressed in both working hours as well as the energy expended for work and other activities. For a nutritional survey, the weight and height of 175 children under six years old and their (100) mothers were

measured. Apart from the anthropometric inquiries, the survey also included questions concerning nutritional habits and health status. In addition, the same anthropometric data was taken from 104 men of the same age-group as the mothers, such that a comparison of female and male nutritional well-being could be made. With respect to several villagers detailed reports were made which listed, for each individual, all their activities as well as the kinds and quantities of foods consumed during a twenty-four hour span. These reports were used to evaluate the individual balance between the expenditure and the intake of energy and nutrients. However, this method is not only quite time-consuming, but also requires the full confidence of the person being examined. For this reason, only ten detailed reports were made from interviews with exemplary individuals. All interviews held in Yasin — regardless of their final purpose — were introduced with general questions on household composition, land size, the number of livestock and fruit trees, etc. Data of this kind were gathered from 98 households in Sandi and from 60 households in Barkulti.

Quantitative methods were supplemented by participant observation. Living in a host family and speaking the local language, Burushaski, greatly facilitated a deeper understanding of the local way of life in general and work and nutrition in particular. Reports from the colonial period found in the *India Office Library and Records* in London, recent but unpublished manuscripts from government institutions and developing agencies such as the *Aga Khan Programme* as well as common literature completed the data basis.

Environmental and historical conditions of production and reproduction in Yasin

At an altitude of 2,160-2,750 m, the Yasin valley is located in the transition zone linking the Hindu Kush and the Karakorum. Its location has two consequences for the economic activities of the people. Firstly, agriculture has to be performed in a harsh climate and environment at the upper limit of the ecumene. Secondly, a distance of more than 100 km — a one-day trip by jeep — has to be covered if one wants to reach the town of Gilgit and the Karakorum Highway, both important for trade and commerce. Thus, Yasin finds itself in a comparatively isolated location, and this will most likely not change even in the distant future. Nevertheless, living conditions have improved during the last 100 years. The beginning of British rule meant the dissolution of the autonomous but arbitrary princely

states and, hence, the end of wars and slavery. The first schools, dispensaries and shops opened in the valley. After the independence of Pakistan in 1947, a successive integration of the Northern Areas, including Yasin, into the national administration occurred. Since then, the development of roads and the spread of markets in the area has resulted in a better and continuous access to food supplies for the growing population of Yasin; the number of inhabitants increased from 6,310 to 27,500 between 1901 and 1991.

Due to the constraining conditions mentioned above, a multi-resource economy has evolved in Yasin. The mixed mountain agriculture comprised of crop cultivation on irrigated fields, horticulture, gardening and animal husbandry is one main pillar of production. The other major source providing the households with food and goods is monetary income from non-agricultural jobs. In addition, there are a number of secondary occupations such as gathering wild plants or exchanging resources between households which also help to earn a living. This highly diversified economy is the prerequisite for the regenerative reproduction of the people.

Work organisation and workload

Aside from the many productive activities, a large number of reproductive tasks have to be tended to by the peasants' households. The organisation of work shows significant daily and seasonal variations. Activities associated with cultivation and gardening have a distinct seasonal rhythm, whereas housework and child care follow the same daily pattern throughout the year. Livestock rearing, on the other hand, takes an intermediate position: Animals have to be tended and fed every day, but the fact that the high pastures can only be utilised temporarily during the summer means that herding activities differ according to the season. While housework and child care remain tasks for the female household members, both men and women are involved in cultivation and animal husbandry. Yet, even here their tasks are differentiated along gender lines. Only a few activities such as harvesting are performed jointly. As a result of the recent increase of male off-farm employment, women are performing more and more tasks formerly done only by men (e.g. irrigation).

Labour division by sex is probably the most obvious criterion of work allocation; yet, age and status are other important factors. Among female household members, it is always the oldest woman who possesses the highest authority. In keeping with her rank, she controls all food

resources, performs the least exhausting tasks and allocates the remaining work to the younger labourers of her household. The youngest daughter-in-law is usually in charge of food preparation and housekeeping; the others assist their mother-in-law in the garden or with the livestock. Because unmarried daughters nowadays are frequently enrolled in school, they only help at home during seasonal labour peaks, especially during the harvest of apricots and grain. Similar patterns of labour division prevail for male household members who — in contrast to women — cooperate for many tasks with neighbouring households (e.g. transport and spread of manure or mechanical threshing). However, there are in reality many exceptions to this "general rule" of labour management in extended families as it is presented here.

Differences also exist between permanent settlements and summer villages. In the latter, only two adult household members, usually a man and his wife, are responsible for all duties. Apart from cultivating barley, men cut firewood for the winter and frequently return to the homestead in the permanent village to pick up supplies for the summer household. In addition to animal rearing, their wives perform all of the housework, look after the children, process milk and — if there is time left — cut hay and collect wild food plants.

The time-allocation-studies show that women work an average of 9 h 35 min every day, whereas the daily average for men was 7 h - that is women in Yasin work longer than men. The often heard argument that men work harder could not be verified in this valley. Although the men's total energy expenditure of 2,901 kcal is higher than that of women (2,714 kcal), their work induced energy expenses of 1,521 kcal is considerably lower than the 1,618 kcal for women. Moreover, it must be emphasised that these results do not include the burden of child care, which young women have to shoulder. It was impossible to record such activities; they were either performed simultaneously with other duties, or they were neglected during the interviews because local people do not consider them to be real work.

At first, the two figures — the working time and the energy expenditures of men and women — do not appear to be extraordinarily high. In many countries, people work much longer and harder than in Yasin. Yet, further analyses of the data show remarkable deviations in workload according to age, household composition, farm size and other parameters (see Fig. 1). Young women, particularly if they are daughters-

in-law, women of large households, men who simultaneously pursue full-time jobs and work on the farm, farmers who are younger than 30 years or manage the farm alone, and especially women and men in the summer villages have a workload which exceeds the average by far.

Fig. 1: Workload according to age, household composition and season

	Working time (h-min)	Work induced energy expenditure (kcal)
Women		
• average	9-35	1,618
• <40 years old	10-55	1,718
• of households with >3 female adults	10-05	1,683
• during summer season (May - July)	11-14	1,935
• during winter season (Nov. - Jan.)	7-13	1,203
• in summer villages	12-18	2,129
Men¹		
• average	7-00	1,521
• <30 years old	7-43	2,178
• during summer season (May - July)	9-27	1,388
• during winter season (Nov. - Jan.)	4-28	872
• in summer villages	10-53	2,652
• with additional off-farm employment	8-46	1696

¹ If not mentioned otherwise farmers without an additional non-agricultural employment.

Source: Author's data 1992/93

Furthermore, significant seasonal variations in the workload have to be taken into account. The working time of both sexes is highest during the irrigation period (May - July) and during the harvest (August - October).

Likewise, the heaviest physiological workload for women falls within these two periods, whereas men work particularly hard throughout the months of field preparation (February - April) and during the harvest. Due to the reduced workload and better food from replenished stores, the winter months (November - January) represent a time of recreation and restoration for men and women — with the noticeable restriction that housework and child care remain daily chores that the women alone must tend to (see fig. 1).

Food consumption, nutritional status and working capacity

A major outcome of work devoted to subsistence production and off-farm employment is the supply of different kinds of food. These are a prerequisite for regenerative reproduction. The manifold economic activities of the peasants result in a great variety of foodstuffs. Yet, insufficient yields, seasonal variability and limited food diversity on local markets constrain the actual nutritional basis. For these reasons, a rather monotone daily diet consisting of large amounts of wheat bread and salted tea prevails in Yasin. Indigenous dietary conceptions, such as the classification of all food items into "hot" (*garum*) and "cold" (*sext*) according to their effects on the organism, or the Islamic grouping of permitted (*halal*) and forbidden (*haram*) food, do not further limit the nutritional spectrum. By contrast, negative consequences arise from the intrahousehold food allocation, which gives preference to men and disadvantage to women. This is surprising in light of the fact that the women have exclusive control over all household food stocks.

In order to compare the people's work-related energy expenses with the real energy supply, a food balance sheet was drawn up for Yasin. It showed that only 88% of their energy needs are being met. While men and women combined expend an average of 2,808 kcal per day, their intake amounts to a mere 2,462 kcal. To make sure that the energy requirements of all household members are adequately met, the energy intake on a food balance sheet should be at least as high as 110%. Although this figure is not met in Yasin, the people evidently do not have the sensation that they are continuously hungry — presumably due to their voluminous diet, which is rich in fibres and fills the stomach without meeting the actual nutritional requirements.

Precise information on the balance of macro- and micro-nutrients with selected villagers was obtained by reports which minutely detailed all

activities and the total food consumption of these individuals. These records showed that a monotonous and poor diet does not necessarily result in a deficiency of all nutrients, whereas even a balanced diet might not prevent such a deficiency due to inadequate absorption or to an excessive loss of nutrients during infections or disease related illnesses. Poor hygiene, low sanitary standards, and especially contaminated drinking water are the main causes of ill-health. Apart from energy related malnutrition, the most common nutritional problems which result either from an unbalanced diet or from health disorders stem from iron deficiencies (especially with women), from iodine deficiencies (as in most high mountain areas), and probably from calcium or other vitamin deficiencies.

The long-term nutritional and health conditions were evaluated by various anthropometric indicators, i.e. height-for-age, weight-for-height and weight-for-age with children and the body mass index ($BMI = \text{weight} / \text{height}^2$) with adults. In children, there was a high prevalence of stunting (low height-for-age), which contrasted with the relatively low incidence of wasting (low weight-for-height) (see Fig. 2). Hence, chronic protein-energy-malnutrition is the main problem in Yasin. Yet the malnutrition is rather mild and the anthropometric status is generally better in the case study area than in the lowlands of Pakistan. However, the situation of both groups is unacceptable because inadequate nutrition and poor health can impair the children's immune system as well as their mental and physical development. If these deficits are not alleviated during childhood, stunted children often become stunted adults. In fact, many adults in Yasin are comparatively small and have a low body mass index. Women are far more affected than men (see fig. 2), but in both sexes mild cases of chronic malnutrition are widespread. As with Yasin's children, the anthropometric status of adults, especially of men, is better than in other parts of Pakistan. Therefore, with reference to nutritional and health conditions, this high mountain region is not as backward as often claimed.

Fig. 2: Malnutrition in Yasin

Affected groups	Proportion of all measurements (%)
- Children with chronic malnutrition (low height-for-age)	53,2
- Children with acute malnutrition (low weight-for-age)	2,2
- Women with low BMI (<18,5)	22,6
- Men with low BMI (<18,5)	8,8

Source: Author's data 1992/93

Insufficient anthropometry poses a public health problem in Yasin because about one quarter of the women and almost 9% of the men suffer from chronic malnutrition or health deficiencies. It is likely that these adults work with reduced working capacity and that their immune system is weakened. Women with a low anthropometry often face additional difficulties during pregnancy and delivery (higher occurrence of abortions, stillbirths, infants with low birthweight, etc.). These impediments can become particularly serious during seasons of heavy workload, especially if these coincide with diminishing food stocks, such as in the spring. Further weight losses are often observed during these months. Therefore, a portion of the population of Yasin always has an insufficient caloric intake, while another portion lives on a diet which is at the lower margin of that which one could call sufficient, and periodically falls below this limit. Because the real extent of the problem is not clearly visible and local people seem to perform their productive and reproductive duties well, outsiders often conclude that they are healthy and faring well. This, however, is a misconception. Although there are neither dramatic clinical symptoms of malnutrition nor breakdowns of the local production system, there is a hidden hunger which permanently affects the people's working capacity and quality of life. This is a major obstacle for further development not only in Yasin, but in practically all developing countries.

References

Beetz, M.

1989, *Die Produktion und Reproduktion des unmittelbaren Lebens. Das Familien- und Geschlechterverhältnis bei Karl Marx und Friedrich Engels.*, Pahl-Rugenstein-Hochschulschriften der Gesellschafts- und Naturwissenschaften 270; Frauenstudien 15, Köln.

Bohle, H.-G., ed.

1993, *Worlds of Pain and Hunger. Geographical Perspectives on Disaster Vulnerability and Food Security*, Freiburger Studien zur Geographischen Entwicklungsforschung 1, Saarbrücken.

Bohle, H.-G. et al., eds.

1991, *Famine and Food Security in Africa and Asia*, Bayreuther Geowissenschaftliche Arbeiten 15, Bayreuth.

Bohle, H.-G. et al., eds.

1993, *Coping with Vulnerability and Criticality*, Freiburger Studien zur Geographischen Entwicklungsforschung 1, Saarbrücken.

Chambers, R.

1983, *Rural Development. Putting the Last First*, Essex.

Edholm, F., Harris, O. & K. Young.

1977, "Conceptualizing Women", *Critique of Anthropology*, 9/10, pp. 101-130.

Elwert, G.

1983, *Bauern und Staat in Westafrika. Die Verflechtung sozioökonomischer Sektoren am Beispiel Bénin*, Frankfurt.

Elwert, G.

1985, "Überlebensökonomien und Verflechtungsanalyse", *Zeitschrift für Wirtschaftsgeographie*, 29,2, pp. 73-84.

Elwert, G. & D. Wong

1981, "Thesen zum Verhältnis von Subsistenzproduktion und Warenproduktion in der Dritten Welt", in *Subsistenzproduktion und Akkumulation Arbeitsgruppe Bielefelder Entwicklungssoziologen*, Bielefelder Studien zur Entwicklungssoziologie 5, Saarbrücken, pp. 255-278.

Engels, F.

1892, *Der Ursprung der Familie, des Privateigentums und des Staats*, Stuttgart (Reprint: Berlin 1964).

Evers, H.-D.

1987, "Subsistenzproduktion, Markt und Staat. Der sogenannte Bielefelder Verflechtungsansatz", *Geographische Rundschau*, 39, pp. 136-140.

Evers, H.-D. & T. Schiel

1981, "Expropriation der unmittelbaren Produzenten oder Ausdehnung der Subsistenzwirtschaft. Thesen zur bäuerlichen und städtischen Subsistenzproduktion", in *Subsistenzproduktion und Akkumulation. Arbeitsgruppe Bielefelder Entwicklungssoziologen*, Bielefelder Studien zur Entwicklungssoziologie 5, Saarbrücken, pp. 279-332.

Harris, M.

1989, *Kulturanthropologie: Ein Lehrbuch*, Frankfurt, New York.

Herbers, H.

1998, *Arbeit und Ernährung in Yasin. Aspekte des Produktions-Reproduktions-Zusammenhangs in einem Hochgebirgstal Nordpakistans*, Erdkundliches Wissen 123, Stuttgart.

Kitschelt, F.

1987, *Die Kunst zu überleben. Reproduktionsstrategien von Fischern in Jamaika*, Bielefelder Studien zur Entwicklungssoziologie 34, Saarbrücken.

Marx, K. & F. Engels

1932, *Die Deutsche Ideologie 1845-1846*, Berlin.

Maxwell, S.

1990, "Food Security in Developing Countries: Issues and Options for the 1990s", *IDS Bulletin*, 21, 3, pp. 2-13.

Räder, C.

1993, *Private Haushalte. Definitionen, Theorien, Entwicklung eines Analysekonzeptes*, Sozialökonomische Schriften zur ruralen Entwicklung 99, Göttingen.

Sen, A.

1981, *Poverty and Famines: An Essay on Entitlement and Deprivation*, Oxford.

Swift, J.

1989, "Why are Rural People Vulnerable to Famine?", *IDS Bulletin* 20, 2, pp. 8-15.

Watts, M. J. & H.-G. Bohle

1993, "Hunger, Famine and the Space of Vulnerability", in *GeoJournal* 30, 2, pp. 117-125.

Wisner, B.

1993, "Disaster Vulnerability: Scale, Power and Daily Life", in *GeoJournal* 30, 2, pp. 127-140.

