

1. Introduction

The collapse of the former Union of the Soviet Socialist Republics (the former USSR) and the consequent disintegration of the command economy that had bound the individual Soviet republics to Moscow caused severe economic dislocation for both the Russian Federation and the newly independent transition economies. Svejnar (2002:8), for example, suggests that while post-1989 growth performance was “mildly to significantly disappointing in Central Europe”, in Eastern Europe and the Commonwealth of Independent States (CIS), the results ranged from “poor to disastrous”. By 1998, average cumulative output across the 25 countries in transition had declined by 42 percent, a reduction that dwarfed the 34 percent reduction in the United States gross domestic product (GDP) during the Great Depression (Fidrmuc, 2001:8). Differences in initial conditions, external factors, reform strategies pursued and the inflows of foreign direct investment into the Soviet Union successor states caused large variations in economic performance among the countries in transition (Fischer and Sahay, 2000; Dolinskaya, 2002; Meyer and Pind, 1999), variations that have been substantiated by a number of country specific studies.¹

There was also a marked variation in sectoral economic performance over the period. While industrial output dropped by 47 percent, even sharper contractions were recorded in light industry, construction and wood processing (Oldfield, 2000:81; Vodianov, 2000). Bessonov (2002:49) attributes this to the domestic market orientation of these sectors, with the most acute contractions experienced in those industries producing end products for the final consumer. In contrast, aggregate agricultural production (down 33 percent over the same period) proved slightly more resilient, notwithstanding the widespread elimination of agrarian subsidies² and the worsening of the agricultural terms of trade (Lerman *et al.*, 2003:1000).

Equally problematic was the *generalized institutional failure*³ that accompanied the collapse of the Soviet Union. As Przeworski (1996:22) acknowledges, while “institutional failure at the centre provides a context in which regionally-based nationalists can effectively mobilize to promote an autonomy movement”, the ensuing autonomy that resulted was also accompanied by the removal of a myriad of institutional supports that had helped underpin the economic and social stability of the Soviet regime. Stark (1992:301), for example, has suggested that, in general, institutionalization was “undoubtedly low and uncertainty was extraordinarily high” following the 1989 regime changes as weak states faced weak societies bereft of independent political organizations or strong civil societies. In the case of the Russian Federation, Djankov *et al.* (2003:608) have emphasized the extreme economic disorganization that occurred after 1989, with the briefs of the emerging public institutions addled by crime, corruption and political influence (Shleifer, 1997; Sonin, 2003), and localism/regionalism subverting financial accountability and the rule of law and order (Zhuravskaya, 2000). In the Republic of Tajikistan, Lynch (2001:51) notes how the severe institutional weakness of the new

¹ See Pomfret (2000) on Uzbekistan, Blackmon (2005) on Kazakhstan, Repkine (2004) on Turkmenistan, Van Zon (2001) on the Ukraine, Khaduri (2005) on Georgia, and the Special Issue of *Problems of Economic Transition* (2005) on Moldova.

² Johnson (1996) suggests that prior to dissolution, the former USSR was directing 20 percent of the government budget – 10 percent of national income – to food subsidies.

³ The authors follow Douglas North (1990) in viewing institutions as encompassing all the formal and informal “rules” that determine the conduct of individuals and groups within a society. Institutional failure can then be either specific (collapse of a bilateral fishing agreement, for example) or generalized (demise of the Soviet Union).

Tajik state was a major contributory factor to the 1992–1997 civil war, while Snyder (1998:8) talks of the “Hobbesian struggle for economic survival” following the abrupt removal of subsidies in the early 1990s. Sokolsky and Charlick-Paley (1999:10) go as far to assert that the absence of “institutionalized mechanisms” for resolving economic, ethnic or political grievances or ambitions is the most critical factor threatening the security and stability of Central Asia and the south Caucasus.

While (re-)building institutional capacity is clearly imperative, the task is hampered by the *lack of social capital*⁴ present in the former Soviet economies (Paldam and Svendsen, 2001). Murrell (2002:13ff.) corroborates this, citing sources which show that participation in clubs and associations was low (and fell further between 1990 and 1995), as was membership in professional or work-related groupings. Circles of friends were also relatively circumscribed within the countries in economic transition, and such countries were “not very well endowed with personal trust (page 9)”. Consequently, as the command economy fragmented, the Hobbesian struggle for economic survival was exacerbated by the absence of such capital, not only making the likelihood of impoverishment greater but also militating against the construction of effective livelihood-supporting escape ladders.

The intention of this technical paper then is four-fold. First, to delineate how economic collapse was reflected in increased levels of impoverishment across the Central Asian region and how current macroeconomic development strategies seek to address such deprivation. Second, to examine the evolution of the Central Asian fisheries sector and to show how it was one of – if not the most – acutely affected sectors by the deterioration in the economic environment (and yet has been largely neglected in the national poverty alleviation strategies now being deployed across the region). Third, to examine the way livelihood or “coping strategies” have evolved for those people who currently derive an income and subsistence from the sector. For illustrative reasons, three distinct groupings, the Kazakh “fisher brigades” based on the North Aral Sea, the “community” fishers of the Kyrgyz Republic (Kyrgyzstan) and the pond culturalists of Tajikistan, were chosen and the livelihood strategies of each were documented as were the particular constraints each group faced. Finally, a concluding chapter identifies the pre-requisites for more effective livelihood-supporting policy interventions within the fisheries sphere across the Central Asian republics.

⁴ The authors use Putnam’s conceptualization of social capital as referring to “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (2000:19).

2. Poverty, well-being and poverty reduction strategy papers (PRSPs) in the Central Asian republics

Historically, the economic and geographic isolation of the Central Asian region was mitigated by (often significant) transfers – as much as 40 percent of GDP in the case of Tajikistan – from the central Soviet budget (Falkingham, 1999:3; Cukrowski, 2006), thus guaranteeing a standard of living that, while lower than in other parts of the Soviet bloc, surpassed that of some of its neighbours (Table 1).

Income per capita was highest in the resource-rich Republic of Kazakhstan and Turkmenistan and, while Tajikistan's income per capita was the lowest of the newly independent former Soviet States (FSS), it comfortably exceeded the per capita incomes of its southern neighbours (Afghanistan and Pakistan). Differences were even more pronounced with regard to adult literacy and life expectancy in Turkmenistan, the lowest among the FSS at 66.4 years and even eclipsed that of Turkey (65.1 years). The incidence of poverty was, nevertheless, considerably higher in the FSS of Central Asia than in the Caucasus, ensnaring between one-third and one-half of the population (Kazakhstan excepted). Inequality was also slightly more acute in the Central Asian region, as measured by the Gini coefficient, but was still markedly less acute than in the neighbouring states of Pakistan, Iran or Turkey.

However, while the region inherited high levels of human capital, overdependence upon Soviet supply and trade networks and budgetary support caused profound problems for the region in the decade following independence. As support was withdrawn and trade relations were ruptured, the Central Asian economies contracted sharply. Hyperinflation emerged, reaching levels of 7 344 percent and 9 750 percent in Tajikistan and Turkmenistan, respectively, by 1993, social expenditures fell precipitously (education and health expenditures fell between two-thirds and three-quarters except in the Republic of Uzbekistan between 1991 and 1996), and real wages collapsed to a fraction of their immediate post-independence value⁵ (Falkingham, 1999:3ff.). The social unrest resulting was most acute in Tajikistan, which was consumed by a civil war costing between 50 000 and 100 000 lives over the period 1992–1997 (Kolstø, 2000). Inequality rose sharply too. In Kyrgyzstan, the Gini coefficient leapt to 0.353 by 1993, increasing over the period 1989–1993 at a rate two and one half times as fast as that registered during the 1980s within the fastest inequality-increasing Western countries (Falkingham, 1999:10). The descent into poverty was equally swift. Milanovic (1998: Table 5.2; Grootaert and Braithwaite, 1998) estimated that by 1994 Kyrgyzstan had the highest levels of poverty of any FSS (84 percent of the population), Falkingham (2000) suggests that 95 percent of the Tajik population was unable to access the minimum consumption basket by 1999, and Milanovic (1998) reported poverty levels of 47–57 percent in the other three Central Asian republics. Child malnutrition also increased, with Babu and Reidhead (2000:655) reporting that 15.8 percent of all Kazakh pre-school children in 1995 were “stunted” (below the expected height for their age), with rates exceeding 50 percent in parts of Tajikistan.

⁵ Falkingham (1999: Table 2) suggests that by 1996, real wages had fallen to just 44.5 percent of their 1991 value in Kyrgyzstan, 34.4 percent of their 1991 value in Kazakhstan and 5.0 percent of their 1991 value in Tajikistan.

TABLE 1
Central Asia: poverty and well-being at independence

	Population (millions) 1990	GDP per capita (US\$) 1990	Poverty (% pop'n.) 1989	Gini coeff. 1989	Life expectancy (years) 1990	Adult literacy (%) 1990	HDI ranking 1990
Former Union of the Soviet Socialist Republics	289.3	N/A	11.1	0.289	N/A	N/A	N/A
Armenia	3.4	4 741	14.3	0.259	71.8	93.0	47
Azerbaijan	7.1	3 977	33.6	0.328	71.0	93.0	62
Belarus	10.3	5 727	3.3	0.238	71.3	95.0	38
Georgia	5.5	4 572	14.3	0.292	72.8	93.0	49
Moldova	4.4	3 896	11.8	0.258	68.7	95.0	64
Russian Fed.	148.7	7 968	5.0	0.278	69.3	94.0	37
Ukraine	52.0	5 433	6.0	0.235	70.5	95.0	45
Kazakhstan	16.8	4 716	15.5	0.289	68.8	93.0	54
Kyrgyzstan	4.5	3 114	32.9	0.287	68.8	93.0	83
Tajikistan	5.5	2 558	51.2	0.308	69.6	93.0	88
Turkmenistan	3.8	4 230	35.0	0.307	66.4	93.0	66
Uzbekistan	20.9	3 115	43.6	0.304	69.5	93.0	80
Afghanistan	N/A	714	6.1	N/A	42.5	29.4	171
Pakistan	115.8	1 862	36.0	0.36	57.7	33.8	132
Iran	57.7	3 253	N/A	0.46	66.2	54.0	103
Turkey	57.3	4 652	N/A	0.51	65.1	80.7	73

Note: The names of Central Asian countries appear in bold. The names of neighbouring non-transition countries are in italics. Population data is from the 1992 World Development Report (World Bank, 1992:Table 1). Data for GDP per capita is in real PPP terms. Data for GDP, poverty levels (neighbouring countries only), Gini co-efficients, life expectancy, adult literacy and HDI ranking are taken from the Human Development Report (UNDP, 1992:Tables 1 and 18). Poverty and Gini data for the transition economies is taken from Pomfret and Anderson (2001).

TABLE 2
Central Asia: trends in poverty and well-being

Country	GDP per capita (US\$)		Poverty (% population)		Gini coefficient		Life expectancy (years)		HDI ranking	
	1990	2005	1989	2003	1989	2003	1990	2005	1990	2005
Kazakhstan	4 716	7 857	15.5	21	0.289	0.32	68.8	65.9	54	73
Kyrgyzstan	3 114	1 927	32.9	40.6*	0.287	0.28*	68.8	65.6	83	116
Tajikistan	2 558	1 356	51.2	64*	0.308	0.33*	69.6	66.3	88	122
Turkmenistan	4 230	3 838	35.0	44	0.307	N/A	66.4	62.6	66	109
Uzbekistan	3 115	2 063	43.6	25.8**	0.304	0.35**	69.5	66.8	80	113

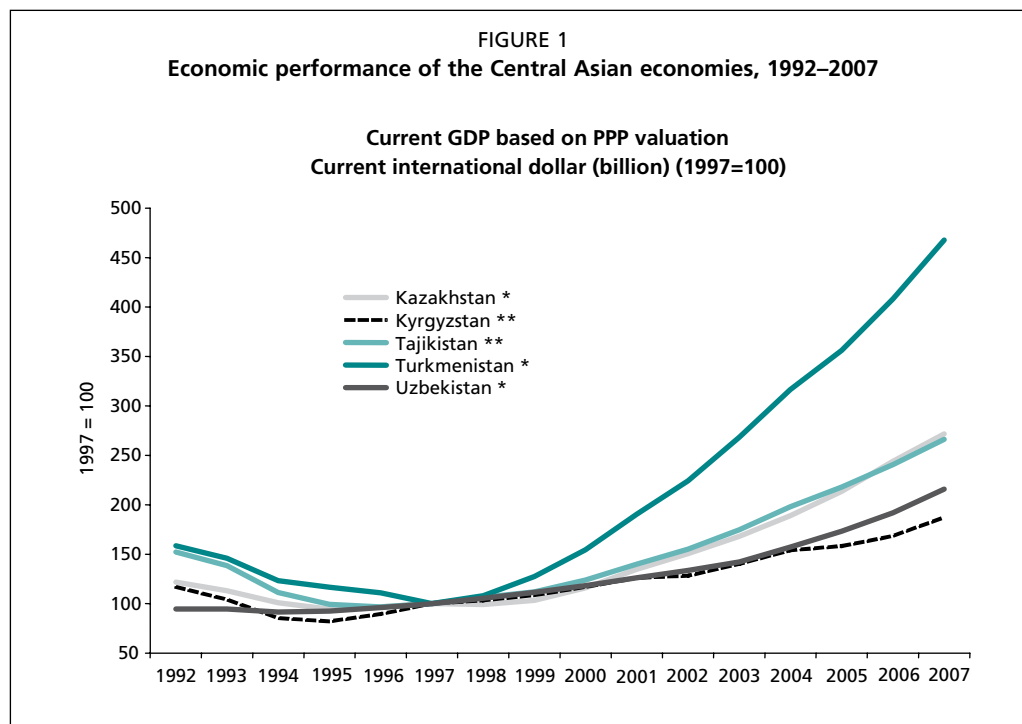
* Data for 2006 from PRSP.

** Data for 2005 from PRSP.

Note: 1989 and 1990 data are repeated from Table 1 above. Data for 2005 GDP per capita are in real PPP terms. Data for GDP, life expectancy and HDI ranking are taken from the Human Development Report (UNDP, 2008:Table 1). Slippage in regional HDI rankings between 1990 and 2005 is explained by a combination of poor socio-economic performance, principally, and increased country coverage. The 2008 report covers 177 countries compared with the 160 countries covered by the original 1990 survey. Poverty and Gini data are the most recent available and were taken from Cukrowski (2006), except in the case of Uzbekistan, Kyrgyzstan and Tajikistan, where figures cited are those that appear in the respective PRSPs.

Fortunately, in the latter half of the decade, a partial economic recovery (Figure 1) helped reverse these trends. Economic growth has continued unabated since the millennium and, in the last decade, national income has more than doubled in Uzbekistan, Kazakhstan and Tajikistan, and more than quadrupled in Turkmenistan, checking the “rollercoaster ride” that the people of the region had endured since independence (Falkingham, 2005). Only Kazakhstan posted a higher per capita income in 2005 compared with 1990 and socio-economic indicators now disclose a more impoverished and vulnerable contemporary population (Table 2)

Although adult literacy levels remain exceptionally high (more than 95 percent), life expectancy across the region is down by three years, and the Central Asian republics



* Estimated data for 2006 and 2007.

** Estimated data for 2007.

Source: International Monetary Fund (IMF), 2008.

have slipped around 20 places (30 places in the case of Turkmenistan) down the HDI rankings. Poverty too, while declining from the mid-1990s high points, remains unacceptably high. In response, governments have devised national development and poverty alleviation strategies, which are also coincident with the Millennium Development Goals (see Box 1).

KAZAKHSTAN

In Kazakhstan, poverty was most acute in the 50 to 60 “sick towns” such as Termirtau, which had depended upon a sole enterprise – since closed – during the Soviet-era (Pomfret and Anderson, 2001:194). Recognition of the sick towns consequently fed through into the *Strategic Plan of Development of the Republic of Kazakhstan up to 2010* (RoK, 2001) that targeted the retraining of the unemployed, the formation of a new entrepreneurial class, the provision of incentives to encourage employers to both preserve old jobs and create new jobs, and interventions targeted at socially vulnerable populations, such as women, orphans and adolescents (2001:Section 4.3–4). The latter group were specifically targeted by the 2002 Law on State Targeted Social Assistance that provided for a programme of social assistance. This programme grew rapidly to provide support to 90.4 percent of the population subsisting below the poverty line in 2003.

A subsequent State Program for Poverty Reduction in the Republic of Kazakhstan, 2003–2005⁶ (RoK, 2003) provided further insights into national poverty. It noted that poverty was both more extensive and severe in rural areas compared with the “non-sick” urban areas, with average cash incomes barely half the level recorded in the cities. Territorially, poverty was concentrated in Mangistau (46.2 percent of the people in poverty and reaching 95.5 percent in the more remote areas) and Atyrau oblasts, which border the Caspian Sea.

⁶ To the best of the authors’ knowledge, no subsequent poverty reduction strategy document has been produced to date.

BOX 1

The Millennium Development Goals (MDGs) and the Central Asian republics

The MDGs were agreed by world leaders at the United Nations Millennium Summit in September 2000, and re-endorsed at a high-level event held in New York on 25 September 2008. Eight goals were identified:

1. Eradicate extreme hunger and poverty
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

These goals were then quantified (e.g. to halve the number of people exposed to extreme poverty and hunger, to reduce under-five mortality by two-thirds, to reduce maternal mortality by three-quarters, etc.) and a target date of 2015 was set by which time these goals were to be achieved. While the United Nations and other international organizations tailor their support to such endeavours, national governments are expected to introduce domestic strategies to ensure that these goals are met at the national level and to report upon the progress towards meeting these goals. The table below details progress in the Central Asian region towards these goals.

Progress towards the MDGs in Central Asia (2007 data)

	Goal							
	1	2	3	4	5	6	7	8
Kazakhstan	☺	☺	☺	◇	◆	◆	◇	◆
Kyrgyzstan	☀	☀	◇	◆	◆	◇	◇	◆
Tajikistan	☀	☀	◇	◆	◆	◇	◆	◆
Turkmenistan	☺	☺	◇	◇	☀	◇	◇	◆
Uzbekistan	◇	☀	☀	◇	◇	◆	◆	◆

Key:

- ☺ – Achieved
- ☀ – On track
- ◇ – Possible, with policy changes
- ◆ – Insufficient information
- ♣ – Off track

Source: www.un.org/millenniumgoals/ and National MDG profiles.

The 2003–2005 programme, which pledged to reduce poverty by 48.8 percent and the number of persons with incomes below the minimum subsistence level by one-quarter between 2002 and 2005, largely re-iterated the policies espoused in the 2010 strategic plan, i.e. to create conditions for employment and entrepreneurship to flourish, to promote vocational training and to target assistance, and added a commitment to improve the effectiveness of, and accessibility to, health, education and infrastructural services. However, despite recognizing the plight of the rural poor, the document proposed no specific initiatives directed towards the fisheries sector, while governmental support to agriculture was focused upon improving the

competitiveness and integrated nature of markets rather than on any explicit pro-poor agro-development strategy.

KYRGYZSTAN

Kyrgyzstan has the most extensive data on poverty available in the Central Asian region, thanks to its participation in the World Bank's Living Standards Measurement Study, which conducted household surveys in 1993, 1996 and annually thereafter (Anderson and Pomfret, 2000; Babu and Reidhead, 2000). These surveys show that the sharp economic contraction after independence, when GDP fell 45 percent between 1991 and 1995, pushed over four-fifths of the population below the poverty line. However, the redistribution of state lands and a series of agrarian trade and pricing policy reforms undertaken over the same period (Livinets, 2007:34) provided the basis for agrarian-led economic growth after 1996 and with it, poverty levels fell. Alam *et al.* (2005:53) note that poverty declined seven percentage points alone (from 63 to 56 percent) between 2000 and 2001, and out of every 100 poor people in 1998, 23 of them escaped from poverty by 2001. Poverty has continued to decline, dropping to 40.6 percent in 2006 (KR, 2007a:8). Although Kyrgyzstan retains an extensive social protection scheme that provides 37 types of benefits to around 11 percent of the population and consumes over one-quarter of the state budget, "the size of these payments is small and its impact on improving of life standard (sic) is insignificant". The 2007 PRSP promises to overhaul the scheme so as to make it more effective (KR, 2007a:66). Poverty, too, is largely a rural phenomenon, except in Talas and Djalal-Abad oblasts where urban poverty levels are higher than rural poverty levels. While regional poverty levels are higher in the western oblasts of Batken (59.1 percent in 2005), Djalal-Abad and Osh (55.4 percent), the highest indices of village poverty are to be found in the Issyk Kul (62.9 percent), Osh (59.7 percent) and Batken (59.4 percent) oblasts.

The current governmental strategy to redress poverty, as espoused in the 2007 PRSP, identifies four priority tasks:

- to enhance economic potential (nine sectors are targeted, including agriculture and processing);
- to combat corruption
- to advance human and social development; and
- to deliver environmental sustainability.

In the case of agriculture, the emphasis is on:

- further land reform;
- cooperative formation;
- a deregulation of food markets; and
- improved financial and extension support.

Significantly, while the strategy promises to establish rural water-user associations, the underlying rationale is to develop irrigation systems. Recognition of the regional divide is reflected in the development of local oblast and rayon-level poverty reduction programmes, which in turn, are melded into the national PRSP. Yet, while "the unique Issyk Kul Lake" is given pride of place in the development strategy for the oblast of the same name, tourism, not fisheries, is the preferred policy tool (indeed, neither fisheries nor aquaculture are mentioned in the 163-page PRSP).

TAJIKISTAN

Although Tajikistan already experienced the highest poverty level of all the FSS at independence, the Tajik plight worsened markedly as the collapse of the Soviet Union saw domestic economic decline (GDP fell over 60 percent between 1989 and 1996), the cessation of budgetary transfers (equivalent to as much as 40 percent of GDP) and a reorientation of (the severely reduced) government expenditures towards the military and away from social services as a consequence of the civil war. Natural disasters, such as

floods, mudslides and avalanches, exacerbated the problem (Abdulai and Tietje, 2006:3). By 1999, more than 95 percent of the population had insufficient income to purchase the minimum consumption basket, and almost one in five people was designated as “extremely poor” and subsisted on an income of under US\$1 a day (Falkingham, 2000). In the cities, the problem was a lack of jobs and inadequate formal sector wage levels. In the countryside, the problem was low agricultural incomes and a lack of access to basic social services (RoT, 2007b:8). There is also a strong regional dimension to poverty, with more than one in three households living in the sparsely populated remote mountainous Gorno-Badakhstan Autonomous oblast bordering China and Pakistan and suffering from extreme poverty (and seven times more likely to be poor than their urban counterparts in Dushanbe). In numeric terms, however, the majority of the poor households are to be found in the two most populous oblasts: Khatlon with 76.1 percent of households in poverty in 2003 and Sogd with 62.3 percent of households in poverty in 2003 (Abdulai and Tietje, 2006:7). To counter such deprivation, households developed a series of coping mechanisms: selling assets, increasing food production for domestic consumption, expanding where possible participation in informal sector activities, accessing humanitarian aid, and borrowing from family and friends, yet it was clear that such strategies would not suffice in the long term.

Although the Tajik economy has been characterized as “extremely weak”, is devoid of mineral resources and suffers from endemic corruption (EU, 2007:50),⁷ high international cotton prices and remittance income⁸ helped underpin economic recovery and reduce poverty at the turn of the millennium, although the effect upon inequality was only marginal (Abdulai and Tietje, 2006:20). The 2002 PRSP was able to build upon this foundation, however, with a four-point strategy intent upon encouraging labour-intensive economic growth, efficient and equitable provision of basic social services, effective governance and targeted support to the most vulnerable (RoT, 2005:4). As economic growth rates hit 10 percent, the 2002 PRSP was superseded by the publication of a National Development Strategy for the Republic of Tajikistan to 2015 and a new 2007 PRSP (RoT, 2007a, 2007b), which sought to operationalize this plan. Three tasks were identified:

- creating the institutional conditions for development, i.e. carrying out public administration and macroeconomic reform, improving the investment climate and developing regional cooperation – termed the “functional” block;
- promoting sustainable economic growth (through developing the infrastructure, energy and industry, and agriculture sectors – termed the “production” block; and
- developing human potential, i.e. providing education, health, social welfare, water and sanitation, and promoting environmental sustainability and gender equality – termed the “social” block.

The agrarian strategy outlined to tackle poverty included: a more transparent procedure for registering land rights, measures to improve the effectiveness of agricultural and water management (drainage and irrigation) infrastructures, and the promotion of rural entrepreneurial activity, which included the attraction of funds from labour migrants for the establishment of fish farms, as well as dairy, sheep and poultry farms, apiculture, and yak and goat herding. Despite these efforts, poverty levels at 64 percent are the highest in the region and national food security was further compromised by the coldest winter in 44 years in 2007/2008 as night temperatures dropped to -25 °C. FAO (2008a:3) estimated losses in the agriculture sector alone

⁷ Tajikistan was ranked 150th (with Kazakhstan and Kyrgyzstan) out of 179 countries on the Corruption Perceptions Index of Transparency International (www.transparency.org). This ranking was still somewhat better than either Turkmenistan, which ranked 162nd, or Uzbekistan, which ranked 175th.

⁸ The IMF estimated remittances from family members, mainly working in the Russian Federation, were around US\$433 million to US\$1 billion (equivalent to 21–50 percent of GDP) in 2004 (IMF, 2005).

amounted to US\$260 million (livestock losses US\$95 million), with the “cold-affected poor and food-insecure households in Khaton and DRD” the most direct beneficiaries of a rapidly assembled FAO Emergency Assistance Programme (FAO, 2008a).

TURKMENISTAN

Turkmenistan’s current development strategy is outlined in the *Strategy of Economic and Political and Cultural Development of Turkmenistan up to 2020* (2006). The copious oil, gas and to a lesser extent cotton revenues, were expected to catapult Turkmenistan onto a par with Western states in terms of wealth generation and living standards. This was complemented by the launch of a National Programme on Improvement of the Social and Living Conditions in Rural Areas in late 2007, in which the focus appears to be the implementation of “hundreds of construction projects”, and a specific development plan for the region (the Balkan Velayat) bordering the Caspian Sea entitled the *Conception of Social and Economic Development of the Balkan Velayat, 2008–2012*. Few details are available regarding the actual contents of either the programme or the plan, let alone the specific fisheries components (if any). Further, while the government reports progress towards meeting a number of the Millennium Development Goals (MDGs), there is a lack of independent data available and external commentators are sceptical of the progress claimed, citing the closure of most local libraries and medical facilities, reductions in state benefits (including the cessation of state maternity and sick leave payments and a reduction in the number of pensions payable to senior citizens), and a lack of both drugs and qualified medical staff (UNDP, 2005b; Nichol, 2006).

UZBEKISTAN

Contemporary Uzbek policy to redress poverty and enhance well-being is encapsulated in the *Welfare Improvement Strategy of Uzbekistan, 2008–2010* (WIS) (RoU, 2007), which doubles as the country’s PRSP. While domestic income equality has increased, as income growth in Tashkent and Navoi oblast has outstripped income growth in the rest of the country, the poverty-stricken people are principally located in rural areas (Table 3), where employment opportunities shrank as “shirkats” (i.e. agricultural cooperatives) were transformed into large private farms (2007:43).

Poverty in Uzbekistan is most prevalent in rural areas, where almost three-quarters of the poor live. Regionally, poverty is highest in the oblasts of Karakalpakstan (which encompasses the Amu-Darya basin and borders the South Aral Sea), where maternal and infant mortality rates were also historically highest⁹ (2007:48), and Kashkadarya (which includes the Kashkadarya River basin in the southern Pamir mountains). McCauley (2004:294), for example, notes with regard to Karakalpakstan that “drought and desertification have combined with the dislocations associated with the Aral Sea’s desiccation to impoverish most of the population”. Urban poverty is linked to unemployment (3.8 percent in 2006) and invisible underemployment in both formal and informal sectors. Presently, poverty is partly ameliorated by a series of targeted social protection programmes (pension fund, employment fund and social assistance) that consume 7.9 percent of GDP, although this is expected to reduce over time as growth continues.

The long-term and medium-term objectives of the WIS (RoU, 2007:6–12) are to:

- maintain high and stable rates of economic growth. If the projected rates of 7–9 percent per annum are achieved, poverty is expected to fall to around 20 percent by 2010;

⁹ The implementation of a series of maternal and child health programmes in the oblast reduced mortality rates from 108.7 per 100 000 newborns in 1991 (national mortality rate = 65.3) to 15.3 per 100 000 newborns in 2005 (national average = 30.8), the lowest in the country.

TABLE 3
Poverty in Uzbekistan by oblast, 2005

Oblast	Poverty rate	Total population (percentage terms)	Percentage of poor
Karakalpakstan	44.0	5.1	8.7
Kashadarya	41.0	8.5	13.5
Surkhandarya	34.6	7.3	9.8
Namangan	33.4	7.9	10.2
Syrdarya	32.6	2.4	3.0
Khorezm	31.0	5.1	6.1
Jizzakh	29.6	3.7	4.3
Navoi	26.3	2.9	3.0
Samarkand	23.9	11.2	10.4
Andijan	23.1	9.5	8.5
Bukhara	20.8	6.4	5.1
Tashkent	20.4	10.1	8.0
Ferghana	15.8	11.6	7.1
Tashkent City	6.7	8.2	2.1
National	25.8	100	100
Rural	30.0	64.4	74.7
Urban	18.3	35.6	25.3

Source: Republic of Uzbekistan, 2007:Table 3.10.

- prioritize human development and welfare by strategic interventions in the health, education, water and sanitation, and environmental fields; and
- improve the effectiveness of governance and the civil service.

At the sectoral level, a 12-point programme for agriculture is outlined that will complete the transition to private farming, focusing upon cash crops, new seed varieties and “substantially increased” capital investment in irrigation water supplies (page 70). Yet, while the WIS introduces the *Concept of Integrated Sustainable Water Supply to the Regions of the Republic of Uzbekistan*, no mention is made of fisheries, an oversight that extends to the entire WIS document.

The Central Asian region has witnessed widespread change over the last 20 years. The collapse of the Soviet Union had an immediate impact upon economic growth and poverty within the region and, although economic recovery has gathered speed over the last few years (GDP growth rates are in the range of 7.3 percent in Uzbekistan to 11.1 percent in Turkmenistan for 2006–2007), poverty levels, with the exception of Uzbekistan, still surpass those of 1989. Poverty, moreover, is more accentuated in certain localities as has been noted: the Caspian Sea oblasts of Mangistau and Atyrau in Kazakhstan, Batken, Talas and Djalal-Abad in Kyrgyzstan (although village poverty is greatest in the lakeside oblast of Issyk Kul), the remote and mountainous oblast of Goron-Badakhstan in Tajikistan, and Karakalpakstan bordering the South Aral Sea in Uzbekistan. While the national development plans (and/or PRSPs) proposed in recent years often have a local/oblast dimension, fisheries or aquaculture as a livelihoods provider or contributor in Mangistau, Issyk Kul and Karakalpakstan is overlooked. This begs not only the question as to why the sector is disregarded thusly, but also the question as to how it too was affected by the economic events of the last 20 years, for posing these questions may provide an answer as to why fisheries is, rightly or wrongly, presently ignored in contemporary regional development strategies.

3. The evolution of Central Asia's inland fisheries

Statistics suggest that the fisheries sector suffered one of – if not the – greatest output declines of any productive sector over the period 1989–2006. Output across the CIS region tumbled more than 60 percent (Table 4).

By 2006, recorded output was down to 3.78 million tonnes (from 9.64 million tonnes in 1989), with the largest absolute declines recorded in the Russian Federation (down 4.8 million tonnes) and the Ukraine (down 740 000 tonnes). Somewhat surprisingly, this collapse in fish production has largely escaped comment to date. While Nilssen and Hønneland (2001) did note that the process of transition affected the Russian fishing industry, their field research was restricted to a study of institutional change in the northwestern fishing region. R. van Anrooy *et al.* (2004) were a little more forthcoming, attributing the decline to fleet contraction and obsolescence, the collapse of Pacific pilchard stocks and reduced distant water fishing (the case of the Russian Federation) and subsidy reduction, reduced investment and obsolescence (the case of the Ukraine), although the primordial thrust of their paper was to examine the extent to which the fisheries sector featured in national development plans across the region. Yet the average decline in fish production, determined as it is by the magnitude of landings made by the Russian Federation, masks an even more calamitous decline in the reported catches of many CIS states. Inland catches in the Central Asian republics of Kazakhstan, Turkmenistan and Uzbekistan fell 60–72 percent, Tajikistan's catches dropped 94 percent and Kyrgyzstan's catches plummeted 98 percent.

Significantly, in contrast to the general economic situation, there has been little evidence to date of (fisheries) output recovering in the Central Asian republics (as discussed in the following sections and documented in Figures 3, 5, 7, 9 and 12), which raises pertinent questions as to the impact such a collapse has had upon fishers' livelihoods across the region and the coping strategies that have been employed as a consequence.

TABLE 4
Fish production in the Commonwealth of Independent States (in tonnes)

Country	1989	2006	Current production as % of 1989 output level
Armenia	7 342	1 406	19.2
Azerbaijan	54 406	4 093	7.5
Belarus	21 457	5 050	23.5
Georgia	148 318	3 075	2.1
Kazakhstan	89 508	35 676	39.9
Kyrgyzstan	1 447	27	1.9
Moldova	8 621	5 082	58.9
Russian Federation	8 246 556	3 456 044	41.9
Tajikistan	3 547	210	5.9
Turkmenistan*	52 974	15 016	28.3
Ukraine	981 783	243 885	24.8
Uzbekistan	25 526	7 200	28.2
Total	9 641 485	3 776 764	39.2

* Associate member since 26 August 2005.

Source: FAO (FIGIS).

FISHERIES IN KAZAKHSTAN

Kazakhstan has the highest level of fish species diversity (151 species) in Central Asia, spread across a waterbody area (excluding the Caspian Sea) of around 5 million ha. Kazakh fish production is essentially sourced from four river basins (the Ural-Caspian, the Aral Syr-Darya, the Balkhash-Alakol and the Irtysh-Zaysan) and the 7 000 lakes encountered in the Steppes region. Intensive development of the fisheries sector commenced in the 1960s and production increased exponentially, to peak at just over 100 000 tonnes in 1975. Besides increased fish harvesting in the Aral Sea and Lake Balkhash, 13 state-run hatcheries were set up near the major reservoirs to facilitate the introduction of high-value species, most notably zander, bream and European cisco. The newly introduced species displaced indigenous stocks of low value, such as roach, rudd, perch and dace, and by the 1990s, the fisheries of Lake Balkhash, the North Aral Sea and the major reservoirs of Bukharma, Zaisan, Kapchagay and Shardara were based almost exclusively on introduced species (Ismukhanov and Mukhamedzhanov, 2003).¹⁰

In Kazakhstan, however, agriculture has historically taken precedence,¹¹ with over 70 percent of national water resources employed to irrigate 3.3 million ha of land, including 1 million ha in the deltaic region proximate to the Aral Sea, through a complex network of irrigation (96 400 km) and drainage (14 900 km) canals¹² (FAO, 2002:4). The consequence of such extensive levels of water abstraction was the desiccation and salinization of the Aral Sea (see Micklin [1988]; Aladin and Potts [1992]; Zholdasova [1997] and Spoor [1998]) and fisheries collapse. Lake Balkhash was similarly affected: the construction of the Kapchagay reservoir upstream on the Ili River in 1969 caused the lake's depth to drop 2 m and its surface area to reduce by 2 610 km² between 1970 and 1989, leading to wetlands degradation, increased salinity and reduced catches (Petr and Mitrofanov, 1998:145).

The World Bank (2004), in the most definitive study of Kazakh fisheries to date, suggests the sector was one of the most profitable and developed in the country in the pre-independence period. The 1991 harvest of 82 690 tonnes of fish, for example, was worth over roubles280.5 million (US\$14.4 million) and generated profits of around roubles79.3 million (US\$3.8 million). The scenario was not to last, and subsequent landings exhibited a steady decline, bottoming out at 21 000 tonnes in 2001, after which a partial recovery to 35 000 tonnes in 2006 took place (Figure 3). Sturgeon landings, in particular, tumbled sharply, falling nine-fold over the period 1989–2006 (Magzumovich, 2007).

A number of reasons are proffered for the decline in fish production. FAO (2002:4) and Ismukhanov and Mukhamedzhanov (2003) suggest poor water management is partly to blame. FAO cites the case of untimely water releases from reservoirs in the Syr-Darya River basin, which spilt both water and fish into depressions without an outflow. Ismukhanov and Mukhamedzhanov chastise the government for failing to install fish protection devices when constructing multipurpose or irrigation dams. Petr and Mitrofanov (1998:149), for example, note how the Takhiatash dam blocked the upstream migration of the Aral barbel. Magzumovich (2007) attributes the decline to a combination of reduced funding (which saw all state-run hatcheries cease operations

¹⁰ FAO FIGIS data suggest that in 1991, bream accounted for 27 percent of catch, Black Sea and Caspian Sea sprat landings accounted for 32 percent of catch and carp (principally common, crucian and silver carp) accounted for 23 percent of catch. In 2005, bream and carp accounted for 63 and 8 percent, respectively, of reported catch (no sprat landings were reported).

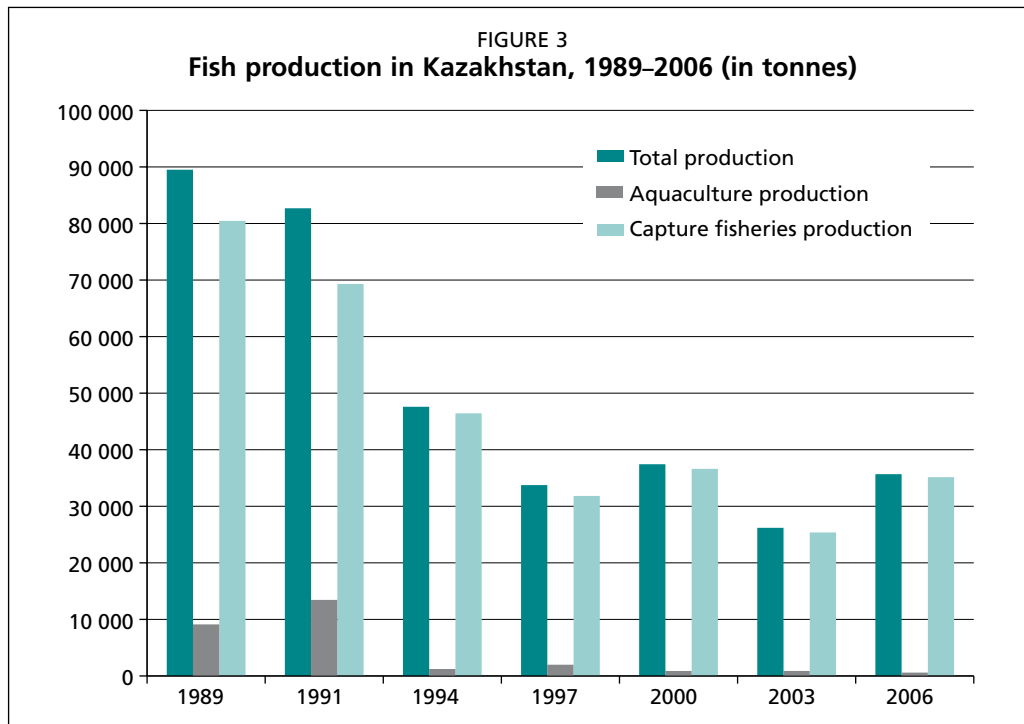
¹¹ The World Bank (2004:27) notes that until recently fisheries was only the *fifth* priority regarding reservoir water use in Kazakhstan.

¹² Since independence, there has been a 30 percent reduction in irrigated area and with it a reduction in organochloride pesticide runoff which, historically, had led to high fish mortality rates.



COURTESY OF R. VAN ANROOY

FIGURE 2
Recreational fishing
near Almaty,
Kazakhstan, 2008



Source: Authors with data from FAO FishStat+, 2008.

for a period¹³) and the fragmentation of authority when, following independence, the Ministry of Fish Resources and its associated committees were abolished¹⁴ and responsibilities were then shared among the Committee of Forestry, Fishery and

¹³ There has been a substantive recovery in the new millennium. Magzumovich (2007) notes that the funds assigned to fish reproduction and release rose from tenge100.4 million to tenge363.1 million between 2001 and 2006, with the number of fish larvae/fingerlings released increasing from 63.47 million to 194.02 million. The same author also notes that a further tenge780 million has been allocated to developing industrial fish-breeding farms under the Programme of Fish Farm Development, 2006–2008, in the Mangistau region.

¹⁴ One consequence of this, as Makhambetova (2008) noted, is that there is now a lack of highly qualified staff in the Kazakh fisheries sector at all levels, including policy research, aquaculture production, administration and wholesale fish distribution. The other Central Asian republics also exhibit similar human capital shortcomings.

Hunt Farming (reproduction and regulation), the Ministry of Natural Resources and the Environment (conservation), and the Ministry of Economy and Trade (fish processing).¹⁵

The figures on national level fish production, as presented in this paper, are used by the authors also in a forthcoming special issue of *Fisheries Management and Ecology*, dedicated to the European Inland Fisheries Advisory Commission (EIFAC) Symposium on Interactions between Social, Economic and Ecological Objectives of Inland Commercial and Recreational Fisheries and Aquaculture, Antalya, Turkey, 21–24 May 2008.

The World Bank (2004) suggests the decline can be attributed to regime change, which involved the restructuring of collective fishing enterprises, the removal of subsidy and fishery support services, and the drastic reduction in public good provision. It also identifies further culprits: water pollution from oil and heavy chemicals, a culprit also identified by Petr and Mitrofanov (1998:148) in the specific case of Lake Balkhash, the introduction of exotic species and the large-scale environmental and hydrologic changes occasioned by the construction of dams and reservoirs. Pond aquaculture, which contributed around 12 000 tonnes of fish annually in the early 1990s, declined due to a combination of high feed and running costs, a lack of equipment replacement parts and the imposition of water and tax charges (World Bank, 2004:60). As the fishery has declined, so have the numbers of people formally employed within the sector. Aralrybprom, the state fishing enterprise operating at the Aral Sea, was liquidated and formal employment has plummeted since the early 1980s when 60 000 were employed in the sector (Fergus, 1999:40).

Nevertheless, the World Bank study also urges caution in jumping to hasty conclusions regarding the current status of Kazakh fisheries, as the abolition of the “Kazrybhoz” (fisheries committees) and the emasculation of state involvement in fisheries since independence precipitated endemic poaching not just in Kazakhstan but across all the Central Asian republics. With “most landings go[ing] unrecorded, the majority of activity in the fisheries sector takes place in the underground economy and does not register in official data (2004:iv)”, leading the World Bank to suggest that actual production levels could perhaps be three to four times the presently declared level of 31 589 tonnes, with a potential resource rent loss of between tenge220 million and tenge335 million (US\$1.5–2.3 million). Indeed, the same document further suggests that as many as 110 000 rural residents may still be informally active within the sector (as opposed to the 5 200 cited in the FAO Fishery Profile for the country [2004] and the 17 300 cited by the Fisheries Ministry in 2006 [Timirkhanov *et al.*, 2007:51]) and that more than 300 000 people nationwide may be dependent on fisheries for their livelihoods (2004:12).

The corner would appear to have been turned, however, as efforts are now underway to revitalize the sector following approval of Decree 72 (2006: *Approval of the Composition of Tender Commissions for Assigning Waterbodies of International and National Importance*), Decree 963 (2006: *About Fishery Sector Development Concept of the Republic of Kazakhstan for 2007–2015*) and Decree 57 (2007: *Approval of the Republican Scheme of Acclimatising and Stocking Fish Reservoirs*). These decrees are nested within the National Socio-Economic Development Plan, 2008–2010. Specific initiatives include:

- assignation of waterbodies to private leaseholders. Subsequent to the approval of Decree 72 (2006), the government granted ten-year leases over 1 466 waterbodies to 956 fish resource users. This formalization of access rights was expected to combat the relative impunity of poachers and poaching (due to stricter controls

¹⁵ This is one reason prompting the World Bank to note that improving the institutional framework for fisheries management is imperative (2004:vi).

- over access introduced by the new lessees) and increase reported landings (as lessees were now expected to formally record and report their landings);
- increased regulatory vigilance. Poaching (or at least being caught poaching) is also a more costly venture now. The number of poachers caught rose 21 percent from 8 449 to 10 203 between 2005 and 2006, and the fines levied increased by almost 300 percent from tenge10.4 million to tenge41.5 million (Magzumovich, 2007). These figures are likely to increase, following the appointment of 441 fisheries inspectors in 2007 (Timirkhanov *et al.*, 2007:45);
 - improved recording systems. The declared yield in the Aral-Syr-Darya basins has risen five-fold as a result (Timirkhanov *et al.*, 2007:25), with a presumed nationwide reduction in the incidence of unreported landings;
 - increased state funding of hatcheries and nursery pond facilities. Funding leapt from tenge246.5 million to tenge406.3 million (more than 65 percent) over the period 2004–2007, with a concomitant increase in the stocking material produced from 76 million pieces to 194.02 million pieces (Timirkhanov *et al.*, 2007:Tables 9 and 25); and
 - increased number of fish processing establishments. The number of fish processing enterprises has increased from 49 to 57 between 2005 and 2006, although five large plants (Ulkenbalyk Ltd, Rybprom Ltd, Karatalbalyk Ltd, Atyraubalyk JSC and Balkhashbalyk JSC) with hygiene standards acceptable to European importers dominate. New technology, principally for filleting pike-perch, has also been introduced into the sector (Timirkhanov *et al.*, 2007:31–34).

FISHERIES IN KYRGYZSTAN

The main waterbody in Kyrgyzstan is Lake Issyk Kul (6 826 km²). Although the country possesses an additional 1 922 lakes covering 600 km², the relative size of the lakes – allied to the altitude and inaccessibility of many of them for much of the year – precludes their playing any systemic role in national fish production. The same can be said of the country's river system. Although more than 3 500 rivers traverse Kyrgyzstan, fishing is largely restricted to only 33 rivers: the Chui, the Naryn, the Talas and the Kara-Darja Rivers and their tributaries. More important in fish production terms are the 13 large artificial reservoirs, which, although directed primarily towards satisfying the country's agricultural (irrigation) and energy (hydroelectricity) needs, also afford opportunities for aquaculture and commercial and recreational fishing.

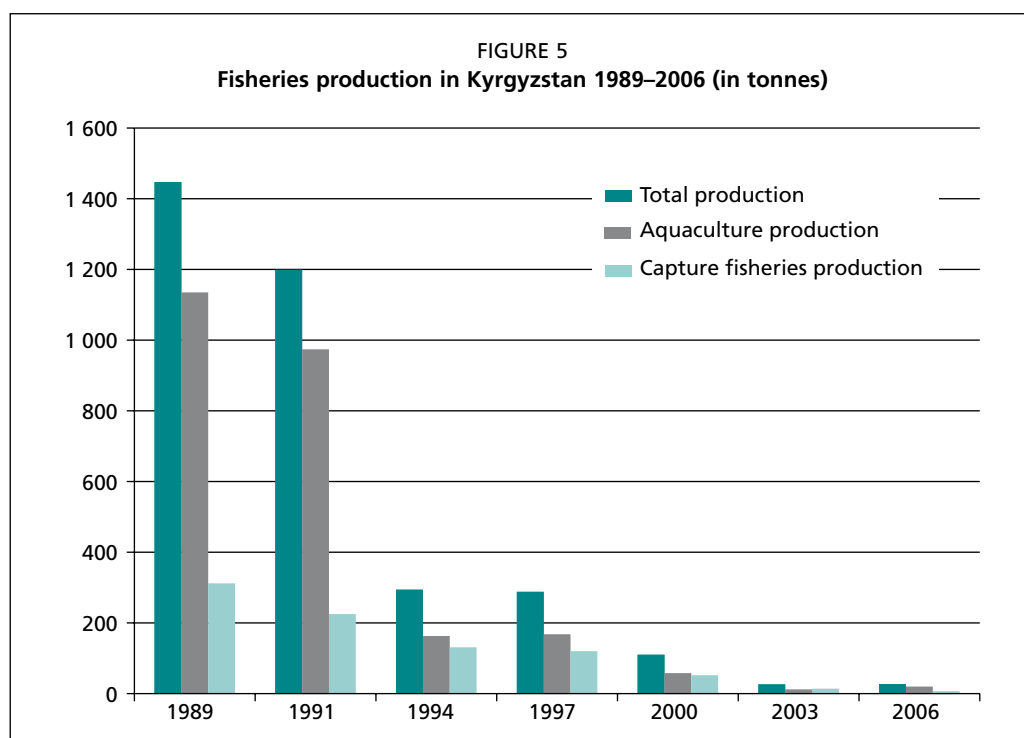
Nevertheless, historically, fish production was dominated by landings from Lake Issyk Kul, initially of dace, and then of newly introduced exotics, principally trout imported from Lake Sevan (1930 and 1936 and later supplemented with trout from two trout hatcheries established on the Ton and the Karakol Rivers), pike-perch (1958) and coregonids (the beginning of the 1970s). Landings from the lake peaked in 1965 at 1 350 tonnes (96 percent dace) and steadily declined thereafter. By 1989, a combination of overfishing and predation by the newly introduced species saw dace landings decline to 193 tonnes (Konurbaev, 2005:8; Savvaitova and Petr, 2003). In their stead, pond culture, principally of common carp and, to a lesser extent, silver carp, expanded following the opening of the Chui, the Ton, the Uzgen and the Talas fish farms between 1950 and 1975. By 1989, 78 percent of the total fisheries-sector production originated from aquaculture (Figure 5).

Post-independence, the fisheries sector has undergone an inexorable decline, culminating with a ban on fishing save for reproductive purposes on the country's two major lakes, Lake Issyk Kul since 2003 and Lake Son Kul since 2006. Paralleling this, the lack of investment due to governmental financial constraints and the withdrawal of state subsidies has ensured growing equipment obsolescence within the aquaculture

FIGURE 4
A fish retailer at
the Osh market in
Bishkek, Kyrgyzstan,
2008



COURTESY OF R. VAN ANRHOOD



Source: Authors with data from FAO FishStat+, 2008.

sector,¹⁶ a scenario exacerbated by a present lack of clarity regarding access rights to waterbodies and the fish therein (FAO, 2008c:7). This prompted low productivity

¹⁶ A number of studies refer to this. FAO (2008c:3/6) laments the lack of studies on catch, conservation and reproduction of fish resources due to financial pressures and the absence of state involvement in fish breeding and stock augmentation over the last decade. Sarieva *et al.* (2008:21–22) note how high costs in the post-independence period caused farmers to rely upon increasingly outdated aquacultural equipment and techniques. FAO (2007b:17) notes that the Cholpon-Alta research station on Lake Issyk Kul has received no finding since 2003. These comments are somewhat contradicted, however, by the *Strategy for Fisheries and Aquaculture Sector Development and Management in the Kyrgyz Republic, 2008–2012*, which notes that state/private hatcheries produced 26 million whitefish eggs and 6.6 million syrok eggs in 2005, and stocked reservoirs with around 9.3 million syrok, carp, trout and whitefish fry the same year.

ponds to be taken out of production, filled in and used for agricultural purposes (Djancharov, 2003). By 2006, recorded fisheries output at 27 tonnes was less than 2 percent of the 1989 level. Employment too dropped from a peak of 1 000 workers in former Soviet times to 72 in the early years of the millennium before rebounding to 396 workers in 2007 (Sarieva *et al.*, 2008:42).

A number of caveats are in order. First, the collapse of the institutional Soviet structures has facilitated in Kyrgyzstan, as in a number of the other Central Asian states, poaching, much of it for subsistence purposes.¹⁷ Moreover, if estimates are correct, the phenomenon is not a negligible one. The Department of Fisheries, for example, estimates that the annual illicit catch could increase to as much as 250 tonnes from Lake Issyk Kul alone (Sarieva *et al.*, 2008), prompting renewed efforts to control such illegal fishing through regulation and the punishment of offenders.¹⁸

Second, official data on pond catches are restricted to the data provided by the two state facilities presently in operation, namely Talas and Uzgen. However, if fish production by the 20 or so currently licensed “private pond operators” as well as catches from the many more ponds, where informal aquacultural activity is probably taking place, were to be included, then the aggregate pond catch would almost certainly be higher. Furthermore, aquaculture prospects look decidedly bright. A private cage-culture enterprise (Ekos International) has commenced activities at Lake Issyk Kul and produced 53 tonnes of trout in 2007, with an annual projected output of 225 tonnes in the near future (FAO, 2007b). This swift success has prompted a number of new entrants such as New-Tek Ltd, Janysh and Co. Ltd, Aquada Ltd and Ladoga Ltd, among others (Sarieva *et al.*, 2008).

Fortunately too, the lack of administrative and legislative clarity regarding the functioning of the sector is presently being tackled. Recognition that the 1997 Law on Fish Industry of Kyrgyzstan was both dated and inadequate led the state to re-establish a Department of Fisheries. Under a new proactive director, the department swiftly promulgated the *Strategy for Fisheries and Aquaculture Sector Development and Management in the Kyrgyz Republic, 2008–2012*, approved by the government on 22 April 2008, and has subsequently managed to attract interest from donors (e.g. FAO, UNDP, the Government of Finland) to support the implementation of the strategy (FAO, 2008c, 2008b). Significantly, the second goal of the five-point development strategy pledges to: “augment the contribution of fisheries and aquaculture in generating socio-economic benefits and *improving the wellbeing of the rural population*” (page 13, the italics are the authors’).

FISHERIES IN TAJIKISTAN

The topography of Tajikistan is similar to that of Kyrgyzstan insofar as it is highly mountainous and has a glacial area (8 percent of the land area) that exceeds cropped area (6 percent). Its annual water production (13 000 m³ per caput) is among the highest in the world. The country is well-endowed with lakes (1 300 lakes, covering 705 km² with the biggest being Lake Karakul, accounting for over half this area), reservoirs (9) and rivers (3 000), and provides around 55 percent of the water flowing into the Aral Sea basin. Historically, as in the other Central Asian republics, the emphasis was on agriculture and Tajik waters were directed down to the cotton and rice fields of Kazakhstan, Turkmenistan and Uzbekistan. Despite this proliferation of water

¹⁷ Sarieva *et al.* (2008:20) estimate that catches by poachers undertaking the activity for subsistence purposes are around 50–70 (Lake Son Kul and national reservoirs), 70–80 (Lake Issyk Kul) and 80–90 percent (national rivers) of the total catch in these waterbodies.

¹⁸ Changes to the Criminal and Administrative Codes in this respect have been submitted to the authorities, while the implementation of Presidential Decree No. 7 of 10 January 2008 led to 53 indictments and fines totalling soms100 200 (around US\$3 000) in the first quarter of 2008 compared with 81 indictments and fines summing to soms14 600 (around US\$400) in the whole of 2007 (FAO, 2008c:12).

FIGURE 6
Harvest from
an extensively
used fish pond in
Tajikistan



COURTESY OF A. THORPE

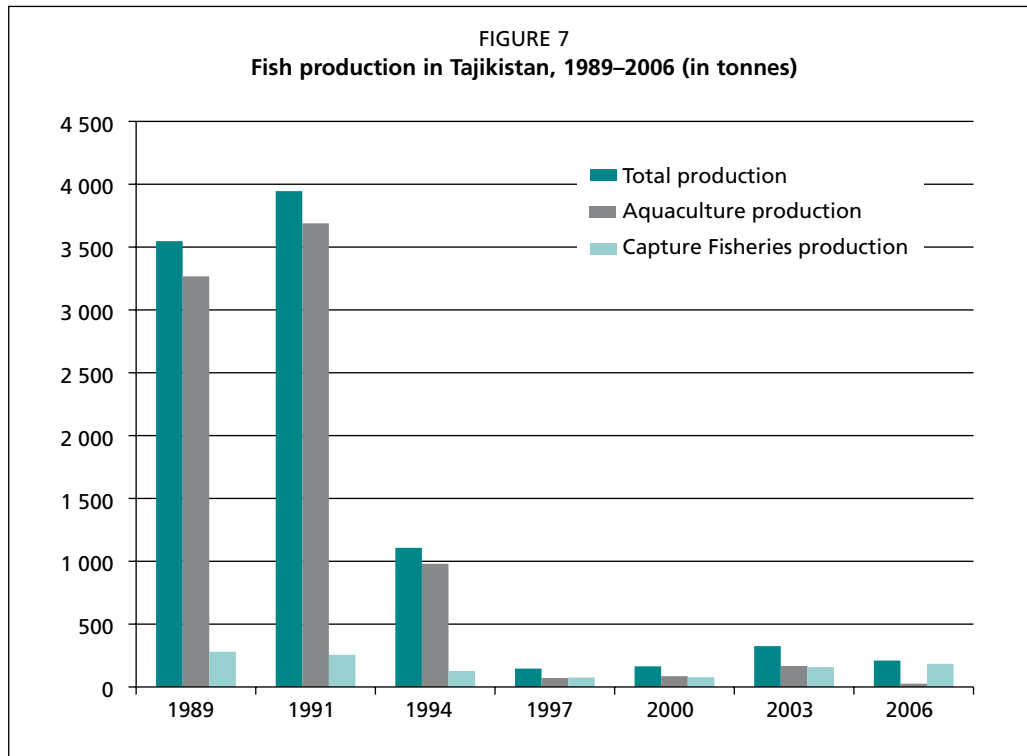
resources, however, there is little information in the public domain on Tajik fisheries. Tajikistan, for example, is one of the few countries for which FAO presently does not have a Fishery Country Profile, while a recent government publication on *Water Management Strategy* (MIWM, 2006) makes only an incidental reference to fisheries.

In Soviet times, fish production largely focused on pond culture. The first fish-breeding farm was established on the Luchobka River in 1936 and Kuybyshev, the first hatchery, was established at Vakhsh in Khatlon oblast in 1951 (Khaitov, 2008:7). Originally covering 72 ha, the farm expanded within the space of 20 years to cover more than 200 ha and to produce 14 million larva for domestic and export purposes. The favourable conditions for pond culture in Tajikistan saw a further ten fish-breeding installations open across the republic and, as fish production drawn from the newly constructed reservoirs in the north, principally at Farkhadskiy, Kayrakkum and Katasey, and in the south at Nurek, expanded too, production reached its zenith in 1991. In that year, pond culture, which contributed 3 298 tonnes or 84 percent of the total fish production, was largely focused on carp (silver and common carp comprised 94 percent of the catch) and smaller quantities of freshwater bream (130 tonnes). Commercial fishing was most in evidence at Kayrakkum, where catches peaked at 192 tonnes in 1993. Although not in evidence at Kayrakkum, fisher brigades (10–15 fishers, 2–5 boats, 10–20 nets) were very much a feature across the rest of the republic at the time, with Khaitov (2008) putting their number as high as 155.

Since 1991, however, there was a swift decline in production (Figure 7). This decline has been attributed to three factors:

- water pollution from industrial enterprises, agrochemical runoff and sewage;¹⁹

¹⁹ Khaitov (2008:36) notes that in 1997 almost 40 m³ of sewage were dumped untreated in the national river system. The most affected rivers were the Kafirnigan River (58 percent of total), the Syr-Darya River (22 percent of total) and the Vakhsh River (8 percent of total).



Source: Authors with data from FAO FishStat+, 2008.

- an increased incidence of illegal poaching; and
- institutional failure, specifically the inability of post-independence institutions to guarantee a regular feed supply, to control fish diseases, and to adequately disinfect and/or maintain production facilities and/or restock effectively, factors in part related to the financial impoverishment of such institutions.

Abduvali (2008) too stresses institutional failure. He attributes the sharp decrease in fisheries output to the deterioration of economic relations with the former USSR (especially Uzbekistan, Kazakhstan and the Russian Federation) – that led to sharp increases in the market price of fish feeds, petroleum, oil and lubricants and a lack of spare parts to repair fish culture equipment and hatcheries – and the civil war that damaged economic and social life in the country. The country's only trout cage-culture facility on the Nurek reservoir was destroyed during the troubles, for example. This decline in output was reflected in sectoral employment: the number of

FIGURE 8
The remains
of one of the largest
Soviet-era hatcheries in
Central Asia, located in
Tajikistan



COURTESY OF R. VAN ANROOY

workers employed dropped from more than 6 000 in the early 1990s to around 1 500 by 2008. Similarly, the number of governmental fisheries staff was reduced from 27 to 9 (Khaitov, 2008 and personal communications with the state enterprise Mohiparvar, September 2008).

By 2006, production had fallen to just 210 tonnes (silver and common carp accounting for 37 percent of the total) and renewed efforts were underway to rejuvenate production in the sector (Figure 7). The limited success of early ventures²⁰ now prompted the government to reformulate its fisheries staff to encourage both private and international investment within the sector. In March 2006, the government announced its investment programme for the period 2006–2008, allocating US\$100 000 to investments within the fisheries sector. In January 2007, the government approved the Fish Culture Law and was presented with the State Fishery Development Programme, 2009–2015, by the state unitary enterprise Mohiparvar of the Ministry of Agriculture. Later the same year, Mohiparvar piloted a new fisheries law through the legislature (October 2007).

These efforts were severely undermined by the extreme winter of 2007–2008, however. The extremely low temperatures not only caused rivers, reservoirs, lakes and ponds to freeze over, but the ice (up to 37 cm deep in places) wiped out a large part of the fish stock used for aquaculture production. A damage assessment report delivered to the Deputy Minister of Agriculture by the state enterprise Mohiparvar in March 2008, for example, suggested that as much as 60 percent of fingerlings were lost: eight farms alone lost 2.8 million fingerlings worth an estimated somoni 1.6 million (US\$470 000).²¹ While Mohiparvar swiftly designed a strategy to prevent bankruptcy and closure across the sector, underpinned by financial and technical support from FAO under a US\$393 000 Emergency Assistance Programme, 2008 output levels are likely to be more than 100 tonnes (FAO, 2008a).

Another clear sign that the Ministry of Agriculture of Tajikistan is aware of the potential of the fisheries sector for improvement of rural livelihoods and food security is also shown by the fact that in November 2008 Tajikistan hosted the regional intergovernmental meeting to initiate the establishment of a Central Asian fisheries organization (Dushanbe, Tajikistan, 10–12 November 2008) (FAO, 2009). In this meeting, Tajikistan, in close collaboration with FAO, brought together fishery sector policy-makers from nine Central Asian and Caucasus countries (as well as China and Turkey).

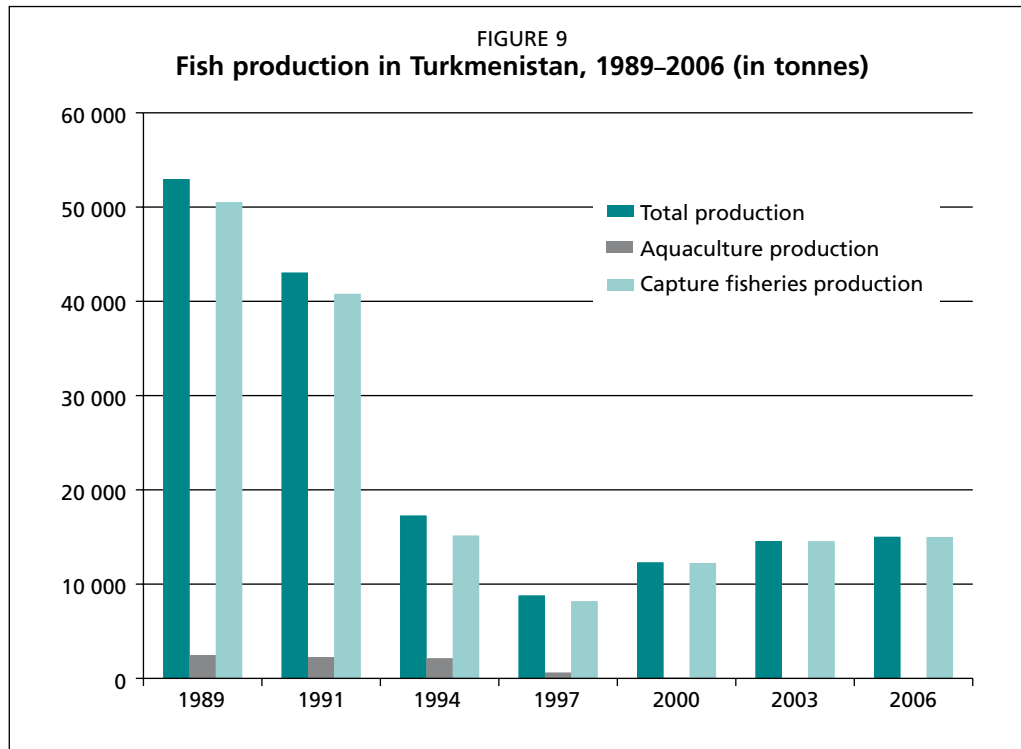
FISHERIES IN TURKMENISTAN

Although Turkmenistan is the fourth largest state of the former USSR by area after the Russian Federation, Kazakhstan and the Ukraine, it possesses one of the largest sand deserts in the world, the Karakum desert, and over 80 percent of the country's land area is bereft of surface runoff. The major water source is the Amu-Darya River (84 percent of total water available), although this river has largely been destined for crop irrigation, more so since the collapse of the Soviet Union²² (Stanchin and Lerman, 2007). Although Turkmenistan features regularly in the literature relating to sturgeon catches in the Caspian Sea, in reality the country is/was entitled to only a small share of the total permissible catch (6.3 percent) due to its short Caspian coastline and its lack of spawning rivers. Entitlement to sturgeon catches may increase following

²⁰ In 2003, the Ministry of Agriculture – without success – solicited funds to farm sturgeon in the Vakhsh valley. The privatization of various state facilities had not brought forth the hoped for private investment and consideration is now being given to increased state involvement in the sector.

²¹ At Forel Ltd, the country's only trout producer, 90 percent of the 2007 cohort perished [along with 60 percent of the 2006 cohort] (personal communication, September 2008).

²² In 1990, 1.33 million ha were irrigated. By 2003, this number had risen almost 40 percent to 1.84 million ha.



Source: Authors with data from FAO FishStat+, 2008.

the recent approval of two sturgeon-breeding projects (Shadrina, 2007; The New Anatolian, 2 October 2006) but production from the breeding projects is unlikely to make any substantive contribution to landing volumes. Historically, catches of Black Sea and Caspian Sea sprat made by the large Soviet fishing cooperatives dominated, with smaller contributions from the commercial fisheries of Lake Sarykamysh, Kahauskhan and Kopetdag reservoirs, and the Murgab basin (Durdyev *et al.*, 2007). However, while the preponderance of sprats in the catch has risen (to 98 percent by 2005), absolute Turkmen annual landings have fallen by over 70 percent to just 15 016 tonnes (Figure 9).²³

Although the sprat biomass, and hence landings, in the Caspian Sea has been significantly affected by ecological factors in the post-Soviet-era,²⁴ the United Nations Development Programme (UNDP) attributes the decline of Turkmen fisheries to the closure of the former Soviet fishing cooperatives (UNDP, 2005a:13). Although this institutional void was partly filled by new fishing companies, the number of workers employed is smaller (100 as compared with 300), and access to fishing equipment, finance, storage facilities and sales channels is sharply constrained. As in the other Central Asian economies, the current management structure is unable to prevent increased levels of poaching. UNDP attributes this to the current high cost of fishing permits (in relation to average catch values) so “as a result, the FIS [Fishery Inspection Service] misses out on a significant amount of revenue to support its management efforts and [this] leads to their insufficient enforcement capacity” (UNDP, 2005a:14). Poaching of the endangered beluga sturgeon is particularly endemic (IWPR, 2004), with Shadrina (2007:68) noting that poached sturgeon is “almost the sole source of subsistence for the local population”.

²³ Aquaculture has never been a significant sector in Turkmenistan. At present, the only active fish hatchery facility in the country is the production association Biotilsimat (formerly Biomelioratsiya), which provides fingerlings and fry to the state for restocking activities and to a couple of private small-scale fish farmers.

²⁴ Sievers (2002:375) attributes the reduction of sprat biomass to the growing preponderance of comb jellyfish (which devastate the plankton upon which the sprats feed) in the Caspian Sea, and a 2001 oil-spill, which killed up to 40 percent of the sprats in the sea.

FIGURE 10
Fish retailers with
love for their
product at one of the
markets in Ashgabat,
Turkmenistan



COURTESY OF R. VAN ANROOY

Aquaculture and inland (excluding the Caspian Sea) capture fisheries production is insignificant at present. Inland catches, mostly destined for household (subsistence) consumption, are estimated at around 500 tonnes annually, but official statistics are lacking (FAO, 2008e:5). Currently, neither inland capture fisheries nor aquaculture is considered to be a priority by the government.

FISHERIES IN UZBEKISTAN

Fisheries in Uzbekistan are concentrated primarily in two river basins, the Amu-Darya and the Syr-Darya (including the Aydar-Arnasay lake system), both of which enter the Aral Sea and whose catchment areas constitute a major part of the Aral Sea catchment. The crisis of the Aral Sea, whose surface area fell 70 percent from 67 499 km² in 1960 to just 17 382 km² in 2006 (the volume decreased by 90 percent and salinity rose ten-fold), was occasioned by the excessive abstraction of water, with a consequent deleterious impact upon fish stocks (Micklin, 2007). Uzbekistan, which accounts for more than 50 percent of the total irrigated area in Central Asia (4.3 million ha), was a major culprit (Umarov, 2003) and, even today, agricultural interests determine river-flow management regimes with “the interest of fisheries having little say” (Kamilov *et al.*, 2004). Pavlovskaya (1995) suggests that the failure to give consideration to the fisheries sector causes around 90 percent of juvenile fish to swim down the irrigation network and to “perish on irrigated fields”.

The decline in the surface area of the Aral Sea presaged the evolution of fisheries in Uzbekistan. Until 1960, Uzbek fisheries were centred on the Aral Sea. Catches largely of common carp, bream, barbel, roach and shemaya peaked at 50 000 tonnes in 1958. As water abstraction increased and the salinity of the Aral Sea rose, the sea shrank, catches declined and the fishing fleets were physically relocated to Lake Sarykamysh



FIGURE 11
Fish sales at Chinaz
wholesale market in
Uzbekistan

COURTESY OF R. VAN ANROOY

and the Aydar-Arnasay lake system in the 1970s.²⁵ Fishing in the Aral Sea ceased in 1983 (although it continued in the deltaic lakes surrounding the Area Sea) and the region was declared a zone of ecological crisis by the United Nations in 1991 (Wecker *et al.*, 2007:6). In livelihood terms, the diminution of the Aral Sea was catastrophic (Karimov *et al.*, 2005:87–90).

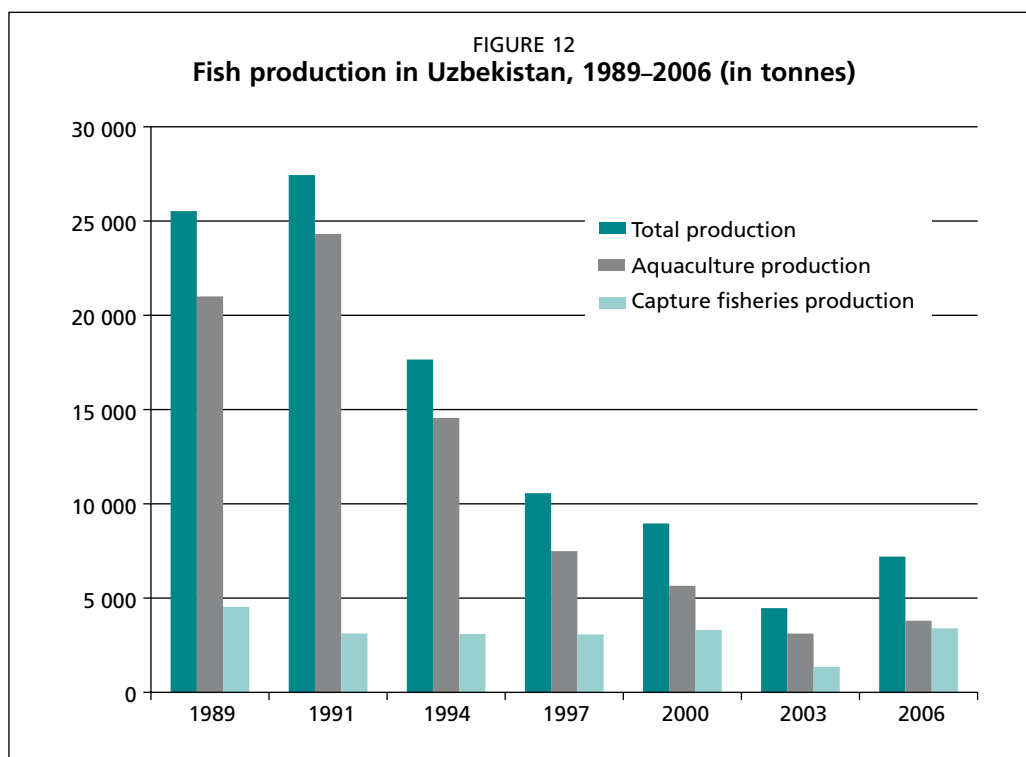
Attention was, therefore, directed towards building up the aquaculture sector. In the 1960s–1970s, the government had established a large-scale programme of pond culture covering some 20 000 ha (Karimov *et al.*, 2009). Twenty new fish farms were created (owned and financed by the state and run under the direction of the Soviet Ministry of Fisheries), state fishing companies were established at all large reservoirs and lakes, new technologies were introduced, research centres were set up and specialist training was provided. Up to 15 million fingerlings of carp were released annually into the country's lakes and reservoirs by the fish farms (Wecker *et al.*, 2007:14). At the time of independence, annual pond aquaculture output increased to 20 000–25 000 tonnes (Karimov *et al.*, 2009), providing the bulk of the country's catch, with silver and common carp accounting for 82 percent of the total (Figure 12). Output was largely destined for the domestic market.

The scenario worsened following independence, however. State fish farms were privatized and financial support withdrawn. Problems facing the sector were exacerbated as the curtailment of links with fishing input firms in the former USSR led to a gradual deterioration in equipment and shortages of formulated fish feed, and large-scale fishing in Charvak, Chimkurgan and other reservoirs virtually ceased (Kamilov, 2003:122; Umarov, 2003:136; Kamilov *et al.*, 2004; Karimov *et al.*, 2009). In 2003, the state ceased the funding of fish restocking activities, and since then there has been no state restocking programme in the republic. In the same year, production, in the absence of a national fisheries programme and a lack of international sectoral support, bottomed out at barely 4 500 tonnes of fish, some 17 percent of its pre-independence level.

This largely coincided with the final phase of the privatization programme,²⁶ which saw the liquidation of Uzbalyk and the complete privatization of all fish capture/

²⁵ In 1964, landings from the Aydar-Arnasay lake system were just 26 tonnes but increased to more than 500 tonnes at the start of the 1970s. Catches peaked at 4 200 tonnes in 1988 (Kamilov, 2003).

²⁶ In the first phase (Decree No. 427 of 1994), all fisheries-linked enterprises and organizations were consolidated within the state corporation Uzrbya. In the second phase (Decree No. 289 of 2001), Uzrbya converted into the slimmed-down joint-stock company Uzbalyk: 25 percent of the shares were owned by the state, 10 percent of the shares were owned by workers and the remainder of the shares were issued for general sale (Karimov *et al.*, 2009:18ff.).



Source: Authors with data from FAO FishStat+, 2008.

culture facilities. One unintended consequence of the programme saw the new owners of the Chinaz feed factory choose to focus their production activities outside the fisheries sector thus precipitating a shortage of fish feed, while a number of fishery extension enterprises that failed to attract bidders/investors were closed (Karimov *et al.*, 2009). Managerial responsibility for the sector was entrusted to the Ministry of Agriculture and Water Resources in 2003. Decree No. 350 of 2003 leased out natural waterbodies on ten-year leases. One beneficiary was the enterprise Akva Tudakul, leasing out Tudakul reservoir for a culture-based fisheries programme that has seen output rise from 150–170 tonnes to more than 1 000 tonnes in the span of four years (Karimov *et al.*, 2009:28).

Since the 2003 nadir, fish production has partially recovered to 7 200 tonnes in 2006. Furthermore, with (i) the government successfully requesting FAO support in identifying effective livelihood-supporting policy interventions in the aquaculture and inland fisheries sector and supporting development of the sector generally, and (ii) an influx of new private investors, such as Asia Agro Alliance, Tashinvest, NT Fish Farm (Tashkent) and Akva Tudakul, there is every chance the country could ultimately produce up to 26 000 tonnes or more of fish annually from its 10 237 ha of pond fish farms (Karimov *et al.*, 2009). Nevertheless, the same source also cautions that following privatization, employment opportunities in the pond-farm industry halved and conditions for fishers have grown difficult as “no measures have been taken to improve the living standards and health of the fishermen and their families”, a task recognized explicitly by the *Aquaculture and Capture Fisheries Development Policy and Strategy of Uzbekistan, 2008–2016*.²⁷

²⁷ Development Objective 2, the social goal, commits to alleviating poverty and assuring food security, increasing employment and generating higher incomes in rural areas while contributing to the health and nutrition of all Uzbeks.



FIGURE 13
Soviet-era incubators
at the largest fish
hatchery
in Uzbekistan

COMMONALITIES AMONG FISHERIES OF THE CENTRAL ASIAN REGION

Output peaked during the Soviet-era, and declined quite precipitously thereafter. These declines were accompanied by increased poaching as institutional structures fragmented and enforcement capabilities shrunk. Supply-chain dislocation saw the newly independent republics unable to access feed, equipment or knowledge (fieldwork disclosed that no practitioners in the field, including academics, state officials or producers, had been able to attend external training courses in contemporary production techniques since 1990) or find a replacement market of significance for their fish products.

Latent problems deriving from the Soviet-era also took on a greater significance in the post-independence period too. Introduced alien predatory species contributed to the decimation of indigenous stocks as was the case of Lake Issyk Kul in Kyrgyzstan and Lake Balkhash in Kazakhstan. Increased salinity and pollution, whether from agricultural runoff (most notably from cotton plantings) or inadequate waste water treatment in Tajikistan, or from oil and heavy chemical spillages in Kazakhstan, had detrimental consequences for the aquatic ecosystem. Moreover, fisheries ranked below irrigation and hydropower generation when setting the policy agenda in each of the republics and, with regard to reservoir waterbodies in Kazakhstan, the sector ranked fifth.

REACTIVATION OF THE FISHERIES SECTOR

Somewhat belatedly, attention is now being focused upon the reactivation of the fisheries sector with the emphasis very much on aquaculture as it is unlikely even in the Caspian Sea that capture fishery could ever again assume the same importance as in yesteryear. Led by private entrepreneurs, and with the active prompting of national fisheries departments and foreign donors, fisheries are being slowly restored to the developmental agenda. *This is no easy task*, given both the general failure to recognize the role the sector can play in national development and poverty alleviation strategies (see Chapter 2, *Poverty, well-being and poverty reduction strategy papers [PRSPs] in the Central Asian republics*) and the continued lack of legislative clarity, although the latter is gradually being rectified in a number of the countries. *However, it is opportune*, given the current surge in basic food commodity prices, a surge that helped tip 75 million more people into the ranks of the hungry in 2007 (Reuters, 17 September 2008a), and given the preoccupation that this may translate into growing food insecurity across the developing world.

Equally, fears have also been expressed that: “... *[fishers themselves]...were left out of the decision-making process, resulting in a loss of livelihoods for them and their families*” (the case of the Aral Sea fishers in Kazakhstan, FAO, 2008e:16); “...*no measures have been taken to improve the living standards and health of the [Uzbek] fishermen and their families*” (Karimov *et al.*, 2009); and that “*socio-economic considerations (for example, livelihood diversification for the local population) should be a governmental priority*” (World Bank, 2004:67). As a consequence, the next chapter of this technical paper examines how three diverse yet characteristic instances of regional “fisher livelihoods” have/are being affected in the post-Soviet-era. The final section builds upon this analysis and identifies the pre-requisites for new livelihood-supporting policy interventions in the inland fisheries of Central Asia.