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**Food Security in  
Transition Countries:  
Conceptual Issues and  
Cross-Country Analyses**

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## **Abstract**

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Most methodological materials and analyses of food security pertain to the classical developing countries of the world. In this paper we discuss the question what pattern of food insecurity has developed across the transition countries? And, are there specific characteristics of food insecurity in the transition economies which can be attributed to the legacy of the socialist era? We argue that various legacies from the socialist system are decisive for today's economic and social environment in which food insecurity in these countries arises and has to be tackled. We discuss how the standard conceptual framework for the analysis of food security has to be adapted to take the specific characteristics of transition countries into account. Furthermore, we investigate if these legacies explain any significant differences in food security between transition and developing countries. We concluded from the analysis that on the macro-level similar basic factors determine food insecurity in transition countries and in developing countries. However, various legacies from the socialist era explain why transition countries have patterns, levels and trends of food insecurity distinct from developing countries. For instance, socialist legacies have contributed to the disproportionate decrease of the agricultural sector in most countries in transition in the 90s, and they still influence the pattern of food supply and consumption. Micro-studies would be needed to identify more precisely which affect the legacies have on food security at the household level.

## Kurzfassung

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Die meisten Analysen und methodischen Ansätze, die sich mit Nahrungsmittelsicherheit beschäftigen, beziehen sich auf die klassischen Entwicklungsländer. In diesem Beitrag diskutieren wir das Ausmaß an Nahrungsmittelunsicherheit, das sich in den Transformationsländern entwickelt hat. Dabei gehen wir der Frage nach, ob es spezielle Eigenschaften von Nahrungsmittelunsicherheit in den Transformationsländern gibt, die auf die in diesen Ländern vorhandenen „Vermächtnisse“ der sozialistischen Epoche zurückgeführt werden können. Wir argumentieren, dass es in der Tat solche Vermächtnisse im ökonomischen und sozialen Umfeld der Transformationsländer gibt, das wiederum Nahrungsmittelsicherheit determiniert. Wir zeigen, wie der konzeptionelle Rahmen für Analysen von Nahrungsmittelsicherheit in Transformationsländern um diese Vermächtnisse erweitert werden sollte. Außerdem untersuchen wir, inwieweit diese Vermächtnisse signifikante Unterschiede von Nahrungsmittelsicherheit zwischen Entwicklungs- und Transformationsländern erklären können. Unsere Analysen zeigen, dass in Transformationsländern ähnliche makroökonomische Faktoren Nahrungsmittelsicherheit determinieren wie in Entwicklungsländern. Gleichzeitig ist festzustellen, dass Vermächtnisse des Sozialismus erklären, weshalb sich die Struktur, das Niveau und die Entwicklung von Nahrungsmittelsicherheit in Transformationsländern und Entwicklungsländern unterscheiden. Vermächtnisse aus der Sowjetzeit haben beispielsweise zu dem überproportionalen Rückgang des Outputs im Agrarsektor in den 90er Jahren beigetragen oder beeinflussen immer noch wesentlich die Struktur von Nahrungsmittelangebot und –konsum. Mikroökonomische Untersuchungen wären erforderlich, um die Effekte dieser Vermächtnisse auf die Nahrungsmittelsicherheit auf der Haushaltsebene präzise zu bestimmen.

## **1 Introduction**

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Most methodological materials and analyses of food security pertain to the classical developing countries of the world. These countries usually start from a lower income level, have predominantly agricultural economies and have experienced either a sizeable decrease or stagnation of their poverty levels in the last decade. Naturally, their institutional environment is rather different from those of transition economies.<sup>1</sup> In contrast, during the 1990s Eastern Europe and Central Asia was the only major region of the world experiencing a marked increase in poverty: while a World Bank study recorded for 1987-88 an average of 14 million people living in absolute poverty in Central and Eastern European Countries (CEEC) and in the Former Soviet Union (FSU), by 1993-95, the number of persons in this region officially classified as poor had increased more than tenfold to an average of 147 million. Poverty and income in transition economies themselves, though, are not homogenous. Absolute poverty (\$2.15 per day) headcounts range from nearly 70 percent of the population in Tajikistan to nearly zero in Slovenia. Food security in this region has deteriorated as well. According to the FAO (1999), there has been a decrease in dietary energy supply in the transforming countries. True, in 12 of the 27 transition countries, undernourishment is still not a significant problem. This should not obscure the fact, however, that the number of undernourished persons in the states of the FSU has risen enough to cause concern, and at 35 to 47 percent of the population is very high in Armenia, Azerbaijan and Tajikistan (FAO 2001). Given these differences in poverty experiences, different starting places and different institutional and policy environments we will address the following questions:

- What pattern of food insecurity has developed across the transition countries?
- Are there specific characteristics of food insecurity and related policies in the transition economies which can be attributed to the legacy of the socialist era?
- Are there any mandatory adjustments in the analysis in order to compensate for potential differences in the determinants of food insecurity between transition and developing countries?

We argue that indeed there are some significant differences between food insecurity in developing countries as if compared with food insecurity in the transition economies. The differences we are referring to are the following: First, there are various legacies from the socialist system which are decisive for today's economic and social environment in which food

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<sup>1</sup> The transition countries taken into consideration in this study are those of central, eastern and southeastern Europe as well as the countries which used to belong to the FSU.

insecurity in these countries arises and has to be tackled. Second, we argue that these legacies and specific economic and political circumstances of transition countries also need to be taken into account when analyzing food insecurity.

### Box 1-1: Definitions, Data and Measurement Issues

#### *What does food insecurity mean?*

**Food security:** A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO 2001).

**Food insecurity:** A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active, healthy life. It may be caused by the unavailability of food, insufficient purchasing power or the inappropriate distribution or inadequate use of food at the household level. Food insecurity, poor conditions of health and sanitation and inappropriate care and feeding practices are the major causes of poor nutritional status. Food insecurity may be chronic, seasonal or transitory (FAO 2001).

#### *Which indicators are available for transition economies?*

**Indicators of food availability and access to food:** per capita dietary energy supply, percentage of undernourished in the population, depth of undernourishment. Undernourishment is defined as food intake that being continuously insufficient to meet dietary energy requirements (FAO 2001).

**Indicators of nutritional status:** prevalence of low birth weight in newborns, prevalence of wasting (low weight for height), stunting (low height for age) and underweight (low weight for age) in preschool children, eventually prevalence of underweight, overweight and obesity in adults (available for the Russian Federation), and scattered data about micro-nutrient deficiencies. Under nutrition, i.e. a shortfall in nutritional status that is captured by human body measurements (anthropometry), results from undernourishment, poor absorption and/or poor biological use of nutrients consumed (FAO 2001).

Against this background the outline of the study is as follows: In chapter 2 we elaborate on some selected legacies that are particularly relevant with respect to the state of food security and food security policies needed in these countries. In chapter 3 we discuss how the standard conceptual framework for the analysis of food security has to be adapted to take the specific characteristics of transition countries into account. In chapter 4 we first group the transition countries with respect to their food security levels and some other socio-economic and political factors based on national data by means of cluster and discriminant analyses. Then we compare these groupings with respective groupings of developing countries. In the concluding chapter 5 we discuss in which areas we have identified the most essential knowledge gaps which have to be filled in order to implement more comprehensive, efficient and well-targeted policies to reduce food insecurity in the transition countries.

## 2 Legacies of the Socialist Era that Might Affect Food Insecurity in Transition Economies

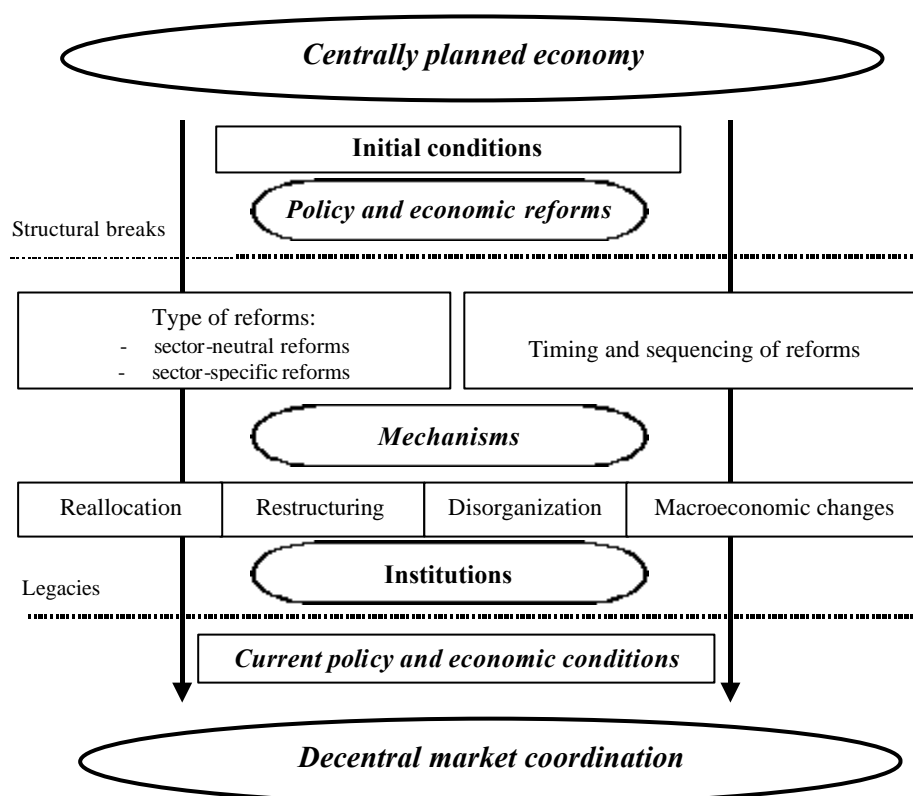
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In this chapter we discuss to which extent food insecurity in the transition countries is affected by problems that are specific to transition countries. We argue that transition countries are different from developing countries because of two distinct features: first, *structural breaks* (e.g. sudden economy-wide output decline; significant increase of unemployment) and second *legacies* (see Figure 2.1). The former have been associated with the partial or total abolition of the former socialist system. Hillmann (2002) argued that “transition after all was the offer of hope for a new life for people who had the personal misfortune to be enslaved in a system that was at the same time reminiscent of Kafka and Orwell”. In contrast, developing countries are on a path of gradual change with only few or limited structural breaks which is also likely to coincide with different expectations of economic agents in these societies.

Generally, the most significant factor in the dramatic increase of poverty and concomitantly of food insecurity during transition is certainly the change of paradigm from a largely egalitarian socialist planned economy to a market economy. On the one hand this transition was associated with an unprecedented decline of economic output and significantly increasing poverty. On the other hand this switch of system is inevitably bound up with greater inequality of income which adds to an increasing risk of getting food insecure. For ideological reasons, under socialism poverty was either inadmissible or admissible on only a small scale, which is why official statistics on poverty as well as on food insecurity in the former socialist countries were – and sometimes continue to be – largely unreliable.

The term ‘*transition*’ refers to the *set of reforms and the timing and sequencing of reforms* with which a country implements the *system switch from plan to market*. This move from a centrally planned economy to a market economy based on decentral market coordination followed rather different patterns in the respective countries. To understand today’s diversity in the economic systems and performance of the transition economies, it is helpful to conceptualize this process. On the eve of transition, the *initial conditions in the transition economies* were different and from that time on the transition path chosen became increasingly country-specific. Three major dimensions of the transition process explain these ever increasing differences: first, due to different political forces at work, as well as cultural characteristics and social conditions, the *initiated reform process* soon became country-specific; second, *the mechanisms* that were set in motion by these reforms are characteristic for each country; third, *the institutions* which create the framework for a market economy and which have emerged from these overlapping processes are very different.

Figure 2-1: The (Country-Specific) Process of Transition



Source: Wehrheim, 2003

In fact, the course that transition took could be broken down in most countries into two phases. In the first phase, emphasis was on the larger political sphere: liberalization, privatization and macroeconomic stabilization. We know today that these policies were necessary but not sufficient for building up a socially equitable market economy.

Instead of bringing prosperity, the collapse of the planned economy and the implementation of the first reform policies led to the destruction of the former state-operated enterprises, to economic restructuring, and usually to a drastic decline in national product and thus also in overall available income. It was only in the second phase of transition that institution building, specifically the creation of a framework for regulatory policy, was seen to be an essential part of reforms. Thus, the initial conditions and the transition process itself, which was by no means completed at the turn of the millennium, resulted in rather unique country-specific institutions which are decisive for the extent to which the current conditions reflect decentral market coordination. Therefore, there are also country-specific legacies of the socialist era which will have differing effects on food security issues. In the following, we discuss some of these legacies which have the potential to impact on food security, nutrition and health outcomes of people in transition countries.



## **Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses**

In our understanding such “legacies” can be defined as follows: formal or informal institutions in the social, political or economic sphere which can be traced back to the socialist period, which have been abolished in the transition period only partially, and therefore today still are part of the system of incentives and constraints determining the decision making process of economic agents. We explicitly relate the legacies to the question how they are likely to affect food insecurity in transition countries. At the same time it is mostly difficult to express such legacies in a quantitative way.

### **Overview of Legacies Likely to Affect Food Insecurity**

Most of the following discussion will be based on a qualitative review of various legacies of which we expect that they affect food insecurity in transition economies. Table 2-1 provides an overview of the most important legacies. We made a distinction between economy-wide legacies and sector-specific legacies. Table 2-2 provides an overview of indicators for which significant differences between transition and developing countries have been identified after controlling for GDP effects (see notes of Table 2-2 for further details on the methodology).

### **Economy-Wide Legacies**

*Unemployment and inequality legacy.* The system change from plan to market was a one time event inducing significant structural breaks in the transition countries such as an unprecedented decline of economic output, a rise in unemployment, and increasing poverty. This process has been associated with a steady increase in inequality in the transition countries in the 1990s (World Bank 1999).

Table 2-1: Overview of Socialist Legacies in Transition Countries which are Likely to Affect Food Security

<i>Type of legacy</i>	<i>Transition specific characteristics</i>	<i>Effects on food security</i>
<i>Economy-wide legacies</i>		
<b>Structural legacy</b>		
<b>Unemployment and inequality legacy</b>	Release of labor from former state sector; often uneven distribution of assets, rising inequality	Increase of official unemployment and increased vulnerability of households without assets
<b>State sector and capture legacy</b>	Allocative inefficiencies due to the persistence of a “big” state sector and capture of politicians by oligarchs	Neglect of rural areas; administrative inefficiencies and weaknesses obstructing efficient food production and implementation of successful food security policies
<b>Social service legacy</b>	Deterioration of social services (e.g. education, health) but from relatively high levels	Some social services still in place and high rates of literacy reduce risk of falling food insecure
<b>Gender legacy</b>	High educational level of the female population and low birth rates	Higher caring capacity and better health status particularly of children
<b>Welfare legacy</b>	Informal networks and neighborly relations formed during socialism	Reduce risk of extreme food insecurity in the absence of targeted food policies
<b>Migration legacy</b>	Sudden increase of rural-urban migration as well as of migration between republics of the FSU	Increasing number of urban poor and people with low monetary income and low purchasing power
<i>Agricultural sector legacies</i>		
<b>Agricultural production/trade legacy</b>	Extreme specialization of agricultural production/trade and limited trade openness during socialism	Significant restructuring of agricultural production/consumption and imbalances in food trade after transition started
<b>Food consumption legacy</b>	High fat, high calorie but low vitamin and low micronutrient intake	Rather malnutrition and not so often under nutrition is an issue
<b>Agricultural policy legacy</b>	Agricultural production and the consumption of food has been highly subsidized in the socialist era	Sudden reduction of state support to farms and abolishment of general consumer subsidies for food
<b>Agricultural reform legacy</b>	Lack of entrepreneurial skills of former (collective) farm workers and anti-reform attitude	Low efficiency of large-scale agriculture; increase of agricultural protection after initial liberalization
<b>Dual agriculture and subsistence legacy</b>	Emergence of a dualistic agricultural sector with corporate farms (former collective farms) and household plots (small-scale farms)	Few land-less people; low commercialization subsistence and peri-urban agriculture; buffer against food insecurity
<b>Agricultural market failure legacy</b>	Poorly developed market institutions in food markets	Comparatively low efficiency of food marketing system and relatively high prices for domestic food

## Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

Another feature of the transition process was that assets were distributed at the outset of reforms in the course of privatization. The distribution of assets was very different between countries and sectors. One commonality of asset distribution, however, was that it rarely complied with equity rules. In some cases so-called “*nomenklatura-privatization*” has yielded very uneven distribution of assets. With respect to land reform, for instance, the distribution of assets was not at all egalitarian. There are also extreme differences in the approaches chosen – Belarus and Turkmenistan have not implemented land reforms at all yet while in Albania and Armenia land has been fully distributed (Csaki, Lerman 2000). It is obvious that uneven distribution of assets can have common effects on specific population groups and can contribute to the risk of becoming food insecure. Increasing unemployment and asset distribution have contributed to another feature typical for the transition countries: rising inequality. The former socialist countries have entered the transition process with one of the lowest levels of inequality in the world. But since then inequality has increased steadily in all transition countries – and dramatically in some (World Bank 2000). Therefore, while unemployment, poverty, and high levels of inequality are also common features of developing countries it again has to be taken into account that the transition countries come from a completely different point of departure.

*State sector and capture legacy.* The former socialist countries were obviously characterized by a very high share of economic turnover attributable to state activities. Due to the size of the state and due to the fact that in many transition countries there was a switch from the omnipresent Leviathan state to a society in which oligarchs play an important role “state capture” is another typical feature inherited from the socialist era. While the phenomenon of the capture economy is not restricted to the transition economies, the specific conditions under which this capture economy has evolved from socialism is typical for transition countries. Kaufmann et al. (2000) argue that state capture can actually be explained by some features of the old regime and the nature of the transition process itself. Ofer (2002) takes the view that the socialist system is the main source of the problems and that the likelihood of state capture in transition economies is bigger than in developing countries for various reasons: the “bigger” size of government in the initial situation, the need to transfer assets to private hands, and the legislative vacuum that needs to be filled.

*Welfare legacy.* The quantity and even more so the quality of social service provision in a given country is decisive for food security analysis because it directly influences the health status of the respective population and the caring capacity of households. During the socialist period a social welfare system that was based on egalitarian principles was established in all socialist countries. Basic social services were abundant, while quality of these services was often weak. The state shouldered the total costs of the former system because of which many social services effectively were public goods (Lohlein et al. 2003). Early on in the transition process the former social security and welfare system collapsed and deteriorated without being replaced by an alternative, market based system yet. On the one hand the sudden deterioration of the social safety net has increased the vulnerability of specific population groups (e.g. pensioners). On the

other hand, there are various indicators which show that the social welfare system in transition countries in general is still in a better condition than in most developing countries. For instance, the variable “Births attended by health staff (as % of total)” was in 1998 still significantly higher for transition countries. Similarly, the variable “Share of public health expenditures, in % of GDP, in 1998” was still significantly higher for transition countries as if compared with developing countries (see Table 2–2). Particularly important with respect to food security of children are social services which help to reduce the vulnerability of children. Indeed, the two indicators “Percentage of children under 12 months that were immunized against DPT” and “Percentage of children under 12 months that were immunized against measles” were both significantly higher for transition countries as if compared with developing countries.

**Table 2-2: Selected Socio-Economic Indicators Revealing Statistically Significant Differences between Transition and Developing Countries for 1998 (or 1997)**

<i>Indicator for 1998 (or 1997)</i>	<i>Sign of indicator for dummy (Transition country = 1)</i>
Commercial energy use (kg of oil equivalent per capita)	+
Electric power consumption (kwh per capita)	+
General government consumption / GDP	+
Births attended by health staff (% of total)	++
Public health expenditures / GDP	+
Immunization ratio of children under 12 months (DPT)	++
Immunization ratio of children under 12 months (Measles)	++
Births per woman	--
Agricultural value added in % of GDP, in 1991	++
Bread and cereal prices in PPP (US price =100)	-

*Notes:* To identify statistically significant differences between transition countries and developing countries with respect to selected socio-economic variables in 1998 characteristic for the respective structural legacy we developed scatter plots showing the cross country relationship (e.g. electric power consumption in Kwh per capita or births attended by health staff) and GDP per capita. We included observations for developing countries and transition countries for which we had data. In cases non-linear relationships were revealed we log-linearized the plots and then used a linear regression in which the respective variable and a dummy variable (1= transition countries) were regressed on GDP. Depending on the significance of the dummy variable we concluded if the respective variable is significantly different for developing and transition countries.

+ positive dummy, significant at the 5% level; ++ positive dummy, significant at the 1% level; -negative dummy, significant at the 5% level; -- negative dummy, significant at the 10% level.

Source: own calculations; data from World Development Indicators, World Bank

*Gender legacy.* The role of women in a society is of pivotal importance with respect to food security issues for various reasons. Particularly the caring capacity of households that is again influential for the nutrition status of households is mainly determined by women. Clearly the role of women in socialist countries has been rather different as if compared with that of women in many developing countries. Two indicators highlight significant differences in the role of women between the two country groups: On the one hand, the number of births per woman was in 1998 in transition countries significantly lower than in developing countries. On the other hand the average educational level of women in transition countries has been much higher. Even in transition countries in which Muslim religion dominates such as in Uzbekistan the share of

## Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

literate women was at the end of the 90s with 77% comparatively high. This is relevant for food security analysis because the educational level of women is decisive for the status of child nutrition.

*Social capital legacy.* Networks – families, neighborly relations etc. – can play an important role in softening extreme food insecurity. The example of Russia demonstrates that household production constitutes a major opportunity for survival during the transition process, particularly in areas where there is no economic progress. At the same time, the importance of informal networks – a phenomenon that already existed under socialism – has continually grown in the transition process and help to mitigate the immediate threats of being food insecure.

*Migration legacy.* The break-up of the FSU but also of former Yugoslavia and other rearrangements of political borders have induced significant inter-country migration flows. One example of such a migration pattern is the following: many Russians who lived in Central Asian countries are migrating back to the Russian Federation without having any secure jobs or pension rights there. Furthermore, war in Tajikistan, Azerbaijan, and Armenia induced much migration of Russians. These migrants are often at a high risk of falling food insecure if family or other informal networks are not available.

### Agricultural Sector Legacies

*Rural bias legacy.* The median of the percentage of the urban population for all transition countries included in this study is 57% and was significantly higher than for developing countries. In some transition countries, such as the Czech Republic and the Russian Federation, this share is even above 70%. Hence, we expected an urban rather than a rural bias to persist in transition countries. However, contrary to our expectations the empirical analysis did not reveal an urban bias in transition countries. If corrected for differences in GDP per capita neither the share of the urban population nor the share of value added produced in agriculture in GDP yields any significant differences for transition countries (see notes to Table 2-2 for further explanation on the method). There actually are indications that before transition started a rural bias existed: the fact that the share of value added produced by agriculture in GDP plunged in the 90s is an indication for this indicator having been higher on the eve of transition. Indeed a regression analysis which controls for the level of GDP per capita of the transition and developing countries indicates that in 1990/91 the share of value added produced in agriculture in GDP was in transition countries on average higher by 13 percentage points. Furthermore, some indirect indicators for 1998 reveal that not only the urban but also the rural sectors are relatively advanced in transition countries which contribute to high average consumption rates of energy. For instance, electric power consumption per capita or commercial energy use per capita (kg of oil equivalent) is significantly higher for transition countries as if compared to developing countries. Both indicators indirectly hint at the fact that infrastructure in rural areas of transition is also relatively well developed as if compared with developing countries. However, in a few

countries such as Albania and in most countries in Central Asia the share of the total population living in urban settings is about or below 40% only (in Kazakhstan the share of the urban population is at 56%). Not surprising, it is also these countries which have the highest share of the total labor force employed in agriculture (Albania 55%; Kyrgyzstan 32%; Uzbekistan 35%; Tajikistan 41%; Turkmenistan 37% in 1990). Furthermore, in many countries in the FSU and CEE the transition process coincided with a significant degree of decentralization. In the Russian Federation, for instance, this process has been impaired by inadequate fiscal redistribution of the various new tiers of government. Due to the lack of sufficient budgetary means, local governments seem to concentrate their scarce resources on urban areas (Healey et al. 1999). This urban bias has resulted, for instance, in greater difficulties of the rural populace to get adequate access to higher quality health care services which are normally provided in urban areas (Lohlein et al. 2003). Hence, while it seems as if rural communities in many transition countries still benefit to some extent from the legacy of a rural bias during socialism there are also indications that in the course of transition, an urban bias has evolved mainly because of the shortage of fiscal resources.

*Agricultural policy legacy.* Prior to reforms and, hence up to the late 80s, agricultural production in the former socialist countries has been highly subsidized.<sup>2</sup> In contrast, many developing countries discriminated against agriculture in the 70s and 80s (e.g. Wiebelt et al. 1992). In many industrial countries support to agriculture in the 80s has mostly been based on price support and hence has been paid for by consumers. In transition countries, the government shouldered the burden of subsidies to producers and consumers of food alike because of which agricultural and food policy was a “double-edged sword”. Agricultural protection levels as measured by Nominal Protection Rates or Producer Subsidy Equivalents for the CEECs as a group have fallen below that of the EU since 1991 and have tended to converge over time. With respect to the CEEC Swinnen (1996) observed that after an initial phase of liberalization ad hoc protectionist measures were introduced in the second phase of reforms. This also seems to be true within the limits set by public budget deficits for many countries in the FSU, e.g. for Russia (OECD 2000). However, country-specific analyses reveal substantial differences between the more recent levels of CEEC’s agricultural protection (Hartell and Swinnen 2000: 189).

*Agricultural production and trade legacy.* The point of departure of agricultural development in the transition countries is significantly different from that of most developing countries. Not only the direction and the degree of policy interventions has been different but also the underlying production structures. Furthermore, the output decline that most countries in transition have experienced has been an inevitable part of market reform (Liefert and Swinnen 2002). The extent of the decline can be partially explained by the omnipresent policy interventions which also determined by and large the production structure of agriculture in the former socialist countries.

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<sup>2</sup> This has been shown in various OECD reports for the group of transition countries (OECD 2000) as well as in individual country studies such as for example for the Russian Federation (OECD 1998).

## Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

Agricultural production in most transition countries has been more industrialized than that in developing countries using more industrial inputs and a higher share of capital. At the end of the 90s the relative importance of agriculture as expressed by the share of value added in agriculture in total GDP is in transition countries not significantly different from developing countries. While the relative importance of agriculture declined in both country groups the rate of change was on average for the transition countries with  $-0.77$  percentage points p.a. between 1990-98 more pronounced (developing countries  $-0.24$  percentage points).

Furthermore, most CEEC and even more so the republics of the FSU were forced to specialize in the production of specific agricultural commodities. The best example is Uzbekistan, where cotton production on irrigated land became the prime factor contributing to one of the world's most severe ecological disasters: the Aral Sea dilemma. Indeed such specialization on a limited range of cash-crops is still significantly affecting food security of those countries which have not succeeded in reversing this trend. Based on the intra-regional specialization of agricultural production agricultural trade of the former socialist countries was also characterized by extreme specialization. The volume and share of intra-regional agricultural trade plummeted accordingly. Between 1992 and 1999 the total value of intra-CIS agricultural trade plummeted from about 20 billion US\$ to merely 12 billion US\$ (GOSKOMSTAT, 2001). Instead, borders have opened for competitive imports from world markets. As a result agricultural and food trade with the rest of the world has been restructured substantially. For instance, livestock production in the region collapsed because of which in the early 90s cereal imports in the FSU plummeted while import of meat products increased substantially in the course of the 90s (see Figure 2-2). While the newly gained openness of the trade regime and the abolishment of the centrally planned trade flows between the former socialist countries has *reduced inter-regional* food trade, transition countries experienced in the 90s a trend of *increasing intra-industry trade* with agricultural and food commodities.<sup>3</sup> For instance, intra-industry coefficients for agriculture and food trade for Poland (Hungary) increased consecutively from 23% in 1988 to 37% in 1996 and 45% in 2000 (Hungary, in 1988: 30%; in 1996: 51%; in 2000: 68%). In the 90s intra-industry trade in agriculture also increased for countries in the FSU but from a much lower level. For the Russian Federation, for instance, the intra-industry coefficient for agriculture and food trade increased from only 5% in 1992 to 20% in 2000.

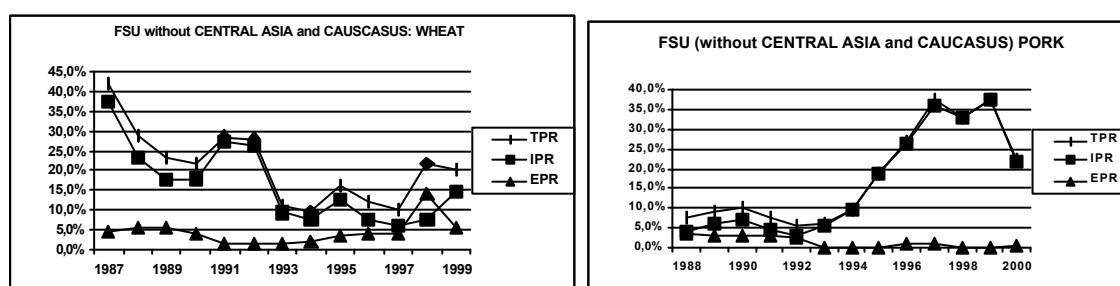
*Agricultural reform legacy.* Collectivization of agriculture that started in the former socialist countries with Stalin's anti-Kulak campaign in the 30s has resulted in a long-lasting bias against family-farm based agriculture. Because the period of collectivization was much shorter in

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<sup>3</sup> Intra-industry trade can be revealed by calculating so-called trade overlap coefficients which reveals the share of imports and exports of a country that is taking place in the same product categories. The closer this coefficient gets to 100% the higher is the share of intra-industry trade and the lower the degree of specialization of a country. Normally the intra-industry coefficients for agricultural and food trade increase with economic development. The value of the coefficient is also dependent on the level of aggregation of the product groups. If one looks at the development of the degree of intra-industry trade over time the aggregation level has to remain the same. The calculations of intra-industry coefficients presented here are based on data from the FAO trade and production statistics on the two-digit SITC level.

the CEECs than in the FSU or never occurred such as in Poland, the eradication of rural entrepreneurship in the CEECs was not as complete as in the FSU. In the transition period agriculture has been de-collectivized in most transition countries. Today farm structures in the transition countries cover a whole spectrum of forms. Former collective, corporate and large farms, medium-sized family farms, and the small subsistence-oriented household plots (Csaki, Lerman 2000). However, management structures of the former collective farms remained often unchanged in spite of the fact that they were formally privatized or re-registered as a new legal entities. In the case of the Russian Federation, for instance, this passive rather than active restructuring of corporate farms was associated with declining efficiency scores of the former collective farms during the mid-90s and a long-lasting output decline (cf. Wehrheim et al. 2000). Often, agricultural lobbyists and conservative nationalists still see the need to protect agriculture against liberalization and privatization in order to secure national interests. Therefore, after five years of reforms, agriculture in the Russian Federation in the mid-90s was said to have been the most unreformed sector in the economy (Sedik et al. 1996).

Figure 2-2: Trade Ratios<sup>1)</sup> for Wheat and Pork for the FSU (Without Central Asia and Caucasus), 1987-1999



Notes: <sup>1)</sup> TPR: Total trade to domestic production; IPR: imports/domestic production; EPR: exports/domestic production.

Source: USDA, ERS, PS&D.

*Dual agriculture and subsistence legacy.* Agriculture during socialism, particularly in the FSU, had a dualistic structure in most transition countries comprising large scale collective farms and small-scale household plots. In fact, agricultural output decline was most pronounced in those transition countries where the dualistic structure of agriculture survived the socialist era (Koester, 1996). At the same time it seems as if the risks of poverty, market upheaval, increases in real prices and inefficiency of markets during the early transition phase have led particularly in these countries to a growth in the significance of household food production. Two forms of small-scale production units are usually encountered: dachas and gardens in peri-urban areas, owned by urban families; household small-scale operations alongside the houses of workers in former collectives by which the household plots are often cross-subsidized to date. In Russia, for instance, in 1995 there were 55 million such dachas and some 15 million private subsidiary plots. The results of a survey of some 700 households in three Russian regions showed that the average proportions for subsistence were 90 percent for potatoes and 45 percent for vegetables, while that



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for eggs (37 %), grain (20 %), and milk (22 %) were clearly lower (von Braun et al. 2000). According to official statistics the subsidiary plots contributed about 50% of total agricultural production in the Russian Federation before the financial crisis which hit the country in 1998 (GOSKOMSTAT 2000). Because of the usually low efficiency of subsistence production it often is a severe obstacle to commercialize agricultural production and therefore has been called one of the vicious cycles specific of the transition countries (Abele and Frohberg, 2002). Good examples are Albania, Moldova, or Georgia where small-scale production units amount but agricultural productivity remains weak. Nevertheless, the rise in subsistence production has been one of the most important strategies to cope with the significant output decline and the fall in real incomes in the early transition period and has been the most significant buffer against falling food insecure in the transition crisis (Seetho et al. 1997). In fact, it is likely that the subsistence production will continue to be an important part of agriculture as long as the economic situation remains unimproved, opportunity costs of work do not rise, and subsistence production continues to constitute a major segment of overall income.

*Agricultural market failure legacy.* While free markets have emerged in most developing countries gradually, they have been a big exception in socialist countries. Therefore, when transition started, there was a lack of knowledge of the regulatory institutions mandatory to manage the complex inter-relationships of a modern and highly industrialized production sector. Respective institutional reforms and economic restructuring with respect to the agricultural and food marketing system have been particularly slow in many transition countries. Price liberalization has been one of the most essential economy-wide reforms that has been implemented in most transition countries at the outset of reforms in the early 90s. However, the evolution of efficient and well-functioning domestic agricultural markets has been severely limited by continued price setting through the state or non-competitive pricing (e.g. Pavel 2001). In Uzbekistan, producer prices for cotton, wheat, and rice are still determined by the state (Bloch 2002). But even in cases in which the state has widely withdrawn from direct price interventions, agricultural markets suffer from poorly designed and implemented formal and informal institutions and high transaction costs and therefore market failures. Hence, in the first half of the 1990s, relatively low levels of spatial food market integration were observed for instance in the Russian Federation (e.g. Loy, Wehrheim 1999). Regional barriers to trade implemented by sub-national governments may have contributed to this low level of spatial food market integration. Another indication of market failures was that even though agricultural producers in various regions of the Russian Federation were taxed rather than subsidized in 1992-94 (Melyukhina et al. 1998) the low prices producers received in domestic markets did not materialize in higher agricultural exports prior to the financial crisis which hit Russia in mid-1998.

*Food consumption legacy.* Analysis of food consumption in transition countries is confronted with problems that are specific to the transformation process (Brosig, Hartmann, 2001). These are due to various legacies with respect to food consumption in transition countries and due to the structural breaks in food demand which occurred at the outset of reforms. To

some extent the food consumption legacy is linked with the above-mentioned agricultural production and trade legacy which was associated with a significant degree of inter-regional specialization and trade with agricultural commodities. Because of specialization on cotton production, Uzbekistan, for instance had a rather low level of self-sufficiency in food products. After the collapse of the Soviet inter-republic trading system production patterns were changed only slowly to better match domestic consumption needs. Today, the country's import dependence is still high (it imported in recent years more than 60% of its wheat requirements, 30% of meat, 25% of milk, and 50% of potatoes).

Another legacy with respect to consumption has been caused by direct policy interventions on the consumer side. During socialism not only agricultural producers but consumers benefited from high and substantial food subsidies, too. From a fiscal point of view this "double-edged sword" was very expensive and contributed to the pressure on public budgets in the late period of socialism. At the same time food subsidies were granted only for certain staple products which were available in high quantities but often at low quality. Hence, to some extent these consumption habits were determined by the fact that during the socialist period the problem was one of lacking choice and quality but not so much of sufficient quantities of food being available. Only a limited range of food items was available which affected food consumption patterns significantly. For instance, the selection of vegetables or fruits available in state shops was limited. In contrast, meat products were said to have been indicative for the living standard of the countries and therefore were made available to the population at prices often far below production costs. Therefore per capita consumption of meat and of bread was extremely high. Because of these distortions in meat markets in the FSU countries, Sedik (1993) expected this sector to restructure most significantly which indeed has been one of the most obvious trends in the 90s.

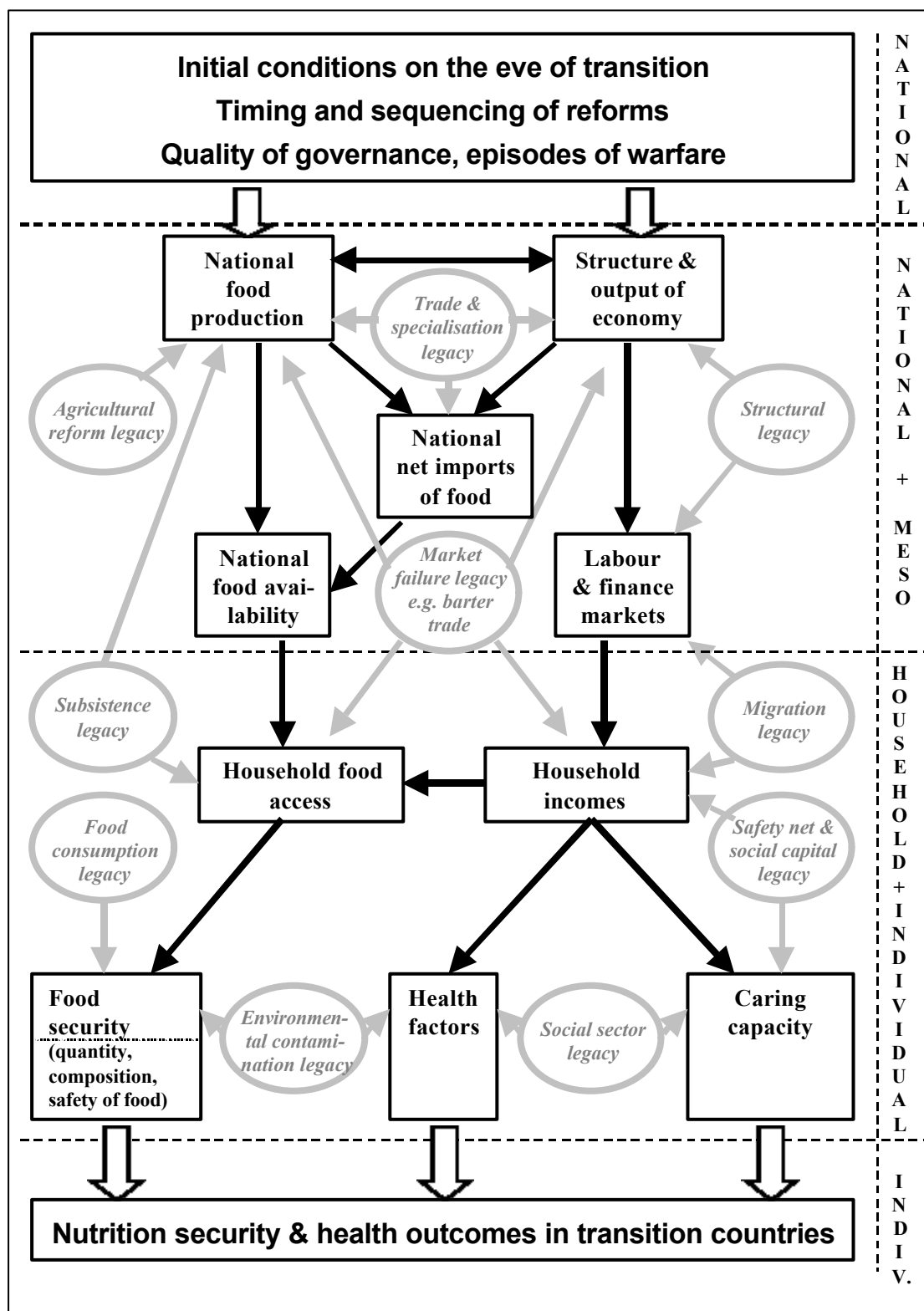
Today these food consumer policies but even more so the consumption habits which were coined during socialism still persist at various degrees in many of the transition countries. For instance, bread was often subsidized to an extent that it could be bought to feed livestock in private production. In an analysis for three Russian regions Melyukhina et al. (1998) showed that bread was the only food commodity which in 1995 was still significantly subsidized. And, in 1998 bread and cereal prices in transition countries in purchasing power parity (US=100) were still significantly lower as if compared with developing countries (see Table 2-2). The associated consumption legacies are likely to contribute to food insecurity patterns in many transition countries which are characterized by over-nutrition and vitamin and mineral deficiencies rather than under nutrition. At the same time the rapid and profound changes in the markets for consumer goods as well as the rapid changes in income affected consumer behavior in transition countries significantly and in fact have caused structural changes in many transition countries (cf. Grings 2001; Elsner 1999).

### **3 Conceptual Framework: Determinants of Food Insecurity in Transition Economies**

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Based on the discussion of the legacies in the previous chapter we will now discuss the implications of these factors for the analysis of food insecurity in this region. We argue that many of the basic factors determining the degree of food security in transition countries are much similar to those affecting food and nutrition security of people in developing countries. However, in the transition context these factors by themselves are affected by a wide range of legacies from the socialist period. In our view, these factors have to be taken into account in the analyses of food insecurity in transition countries because they change the patterns of food insecurity and the coping mechanisms of people which are at a high risk to become food insecure. Such coping mechanisms are likely to be different in transition countries for various reasons: people in most transition countries enjoyed relatively high food security for many decades at least in quantitative terms and were struck by the increasing food insecurity associated with the advent of transition; they have experienced structural breaks and at the same time are confronted with the various legacies. In contrast, the perception of “secure access to food” in a developing country that is on a gradual reform path and that is characterized by a steady state is likely to be different. People in developing countries have often developed various means of coping with adverse events which reduce food security over time. Figure 3-1 conceptualizes the various factors which affect nutrition security and health outcomes of the population in transition countries. On the one hand we indicate the basic factors which are also relevant with respect to developing countries (in squares with bold lines). On the other hand, these factors and determinants themselves are affected in transition countries by the various legacies discussed in the previous section (shaded ellipses). All factors and determinants of food and nutrition security are distinguished at three different levels.

Figure 3-1: Factors Affecting Food Security in Transition Countries



Source: adapted from Smith and Haddad (2000)

On the first, the national level, the transition path of each individual country is decisive for the food security situation of the population in the respective country (see Figure 2-1). The

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most essential factors affecting the economic outcome of this process are the initial economic, social and political conditions on the eve of transition, the timing and sequencing of reforms thereafter and the evolving quality of private and public governance. The latter was in some countries not only extremely weak but even led to episodes of warfare which quite obviously affected the performance of these economies most negatively. This leads us to one substantial difference of food security issues in transition countries as if compared with that of developing countries: While food insecurity in developing countries is often chronic it is expected to be transitory in most transition countries and in fact is not a significant problem in many transition countries anymore. Only in the case of those countries where the J-curve shape of economic development does not materialize in due course and where the initial conditions with respect to food security have already been very blunt at the outset of the transition process chronic food insecurity is to be expected. Hence, economic development, more efficient sector and economy-wide reforms as well as the discontinuation of war episodes in transition countries provide the chance to significantly and quickly reduce food insecurity in this region.

On the second level various factors affecting food security on a national and meso-level are shown: the level of national food production, the structure and output of the economy in general, national trade balances, labor and financial markets, and national food availability are essential determinants. The speed at which the agricultural sector reforms - such as the privatization and distribution of land being implemented - obviously is decisive for the recovery of domestic agriculture and food production. One of the most essential legacies is the prevalence of market failures which often is simply due to the vacuum of institutions owing to the abolition of the old centrally planned institutions or simply to market power and non-competitive pricing which again often are a reminiscence to the old system.

On the third level, the food security of households and individuals is mainly a question of accessibility of sufficient amounts of safe and nutritious food. Insufficient purchasing power, high levels of inequality, the inappropriate distribution or inadequate use of food result in food insecurity. Food security, health factors and the caring capacity of households are essential for the nutrition security of individuals. However, similarly to the national and meso-level there are various legacies from the socialist era which have the potential to affect these household factors significantly either positively (e.g. higher caring capacity of women; better social security system for pensioners) or negatively (e.g. environmental contamination of agricultural production areas; persistent consumption habits with high fat, low vitamin, high alcohol diets).

## 4 Cross-Country Comparison: Classification of Transition Countries with Respect to Food Security, the Socio-Economic and Political Situation

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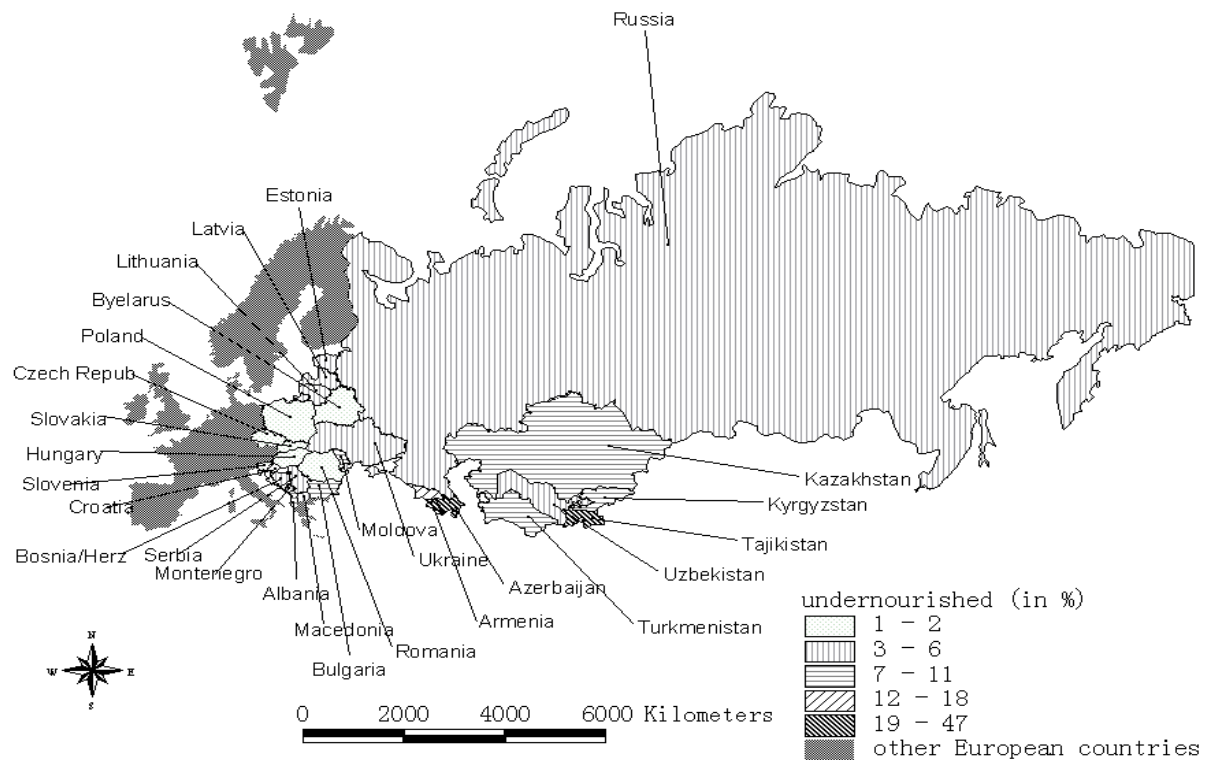
A starting point of the subsequent empirical analysis is the hypothesis that the vast and heterogeneous region of CEEC and the FSU has been subject to increased spatial differentiation since the beginning of the transition in the early nineties. In fact, the countries concerned have followed quite different trajectories with respect to economic development, food security, and general living conditions (compare data from FAO 2001, World Bank 2000, and Freedomhouse 2000). As mentioned in chapter 2, initial conditions which are for instance the result of the geographical location as well as the legacies from the socialist period are expected to play an important role in this process. To verify this presumption, an overview of the variation of food security and nutrition indicators within the region is given first, before a multivariate approach (cluster analysis and subsequent discriminant function analysis) is followed in the second part to identify distinct geographical patterns with respect to food security, socio-economic and political conditions. A joint multivariate analysis using the same methodology and variables is applied to contrast developing and transition countries with respect to food security characteristics.

### Geographical Overview of Food Security and Nutrition

Regarding the food security and nutrition situation, a range of eligible variables for their assessment has been presented in Box 1. For the percentage of undernourished as an indicator of food security, no long-term time series are available for countries in transition, as the first estimates for this region have been released in 2000 (FAO 2000). The map in Figure 4-1 illustrates the percentage of undernourished from FAO 2001 for the average of the years 1997-99 for the CEEC and FSU region. Obviously, the conflict countries at the Southern rim of the FSU region (Armenia, Azerbaijan, Tajikistan) are worst affected by food insecurity according to the estimated percentage of undernourished, which exceeds 35%. For other Central Asian and Caucasian countries as well as some Balkan countries (Albania, Bulgaria, and Croatia) and Moldova, it is estimated that 10 to 20% of the population cannot meet their minimum dietary energy requirements. In contrast, the situation is quite favorable in all other countries in Central Europe, with the share of undernourished people falling below 2.5%.

## Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

**Figure 4-1: Mapping of the Percentage of Undernourished in the CEEC and FSU**



Source: own presentation based on data from FAO 2001

Another variable related to food security is child malnutrition, which is either indicated by the share of children that are stunted, wasted or underweight (see Box 1). It should be noted that nutritional outcomes hinge not only on food security at the national and household level, but also on caring practices and factors affecting health outcomes (UNICEF 1990; see Flowchart in Chapter 3). The cross-country variation of child malnutrition indicators does not necessarily reflect differences in the nutritional status of entire populations. For 13 out of 27 countries, nationally representative nutrition surveys have been conducted among children in the nineties. The map in Figure 4-2, illustrating the share of stunted children (data are taken from WHO 2002), reveals a slightly different situation than Figure 4-1.

A similar tendency of adverse outcomes as for the percentage of undernourished can be observed in the Southern part of the region. However, there are obvious disparities between the share of stunted children and the percentage of undernourished for some countries. For instance, the indicator presented in Figure 4-1 suggests that the overall state of food security in Uzbekistan is with less than 7 % of the population that is undernourished not too problematic. What causes far more concern, however, is the high share of stunted children of 31% in 1996 as shown in Figure 4-2. Although this may be seen as an indication that access to food by children, which are both socio-economically and physically vulnerable to malnutrition, has been much more affected during the transition than access to food by other population groups, firm conclusions on this issue would require further research. First, the reliability of dietary energy supply data, which are

based on agricultural production statistics and from which the undernourishment estimates are derived, has to be questioned for such a non-democratic country as Uzbekistan. Second, studies on household food consumption would be needed to check if the assumptions on inter-household distribution inherent in the estimation of undernourishment are realistic in the present situation. Last but not least, other possible causes of child malnutrition than lack of dietary energy should be thoroughly investigated. Stunted growth in children might be the outcome of a relatively low status and caring capacity of women even in an advanced islamic society, frequent illnesses like diarrhea or respiratory infections, limited access to health care due to financial constraints, micronutrient deficiencies resulting from an unbalanced diet, and even environmental contamination. Case studies in several transition countries (in Russia, for example) indicate in fact that the socio-economic situation of families with small children has worsened in the last decade, and poverty is not only a root cause of food insecurity (including unbalanced diets), but also affects caring capacity, access to health care, health environments and health status. Other vulnerable groups like pensioners have also been disproportionately affected in some countries (e.g. in Serbia), which is likely to have had negative consequences for their food security, health and nutrition

The food security situation of countries in southeastern Europe also deserves mentioning: Whereas Albania is doing poorly with respect to both the percentage of undernourished (10% in 1997-99) and stunting in children (15.4% in 1996-98), the relatively high level of food deprivation estimated for Croatia (15% in 1997-99) is not reflected in the share of stunted children, which amounted to merely 0.8% in 1995-96<sup>4</sup>. A preliminary explanation for these differences is the observation that under nourishment in Croatia has been an immediate reflection of the countries involvement in war in the mid-90s and is rather a transitory but not a chronic phenomenon.

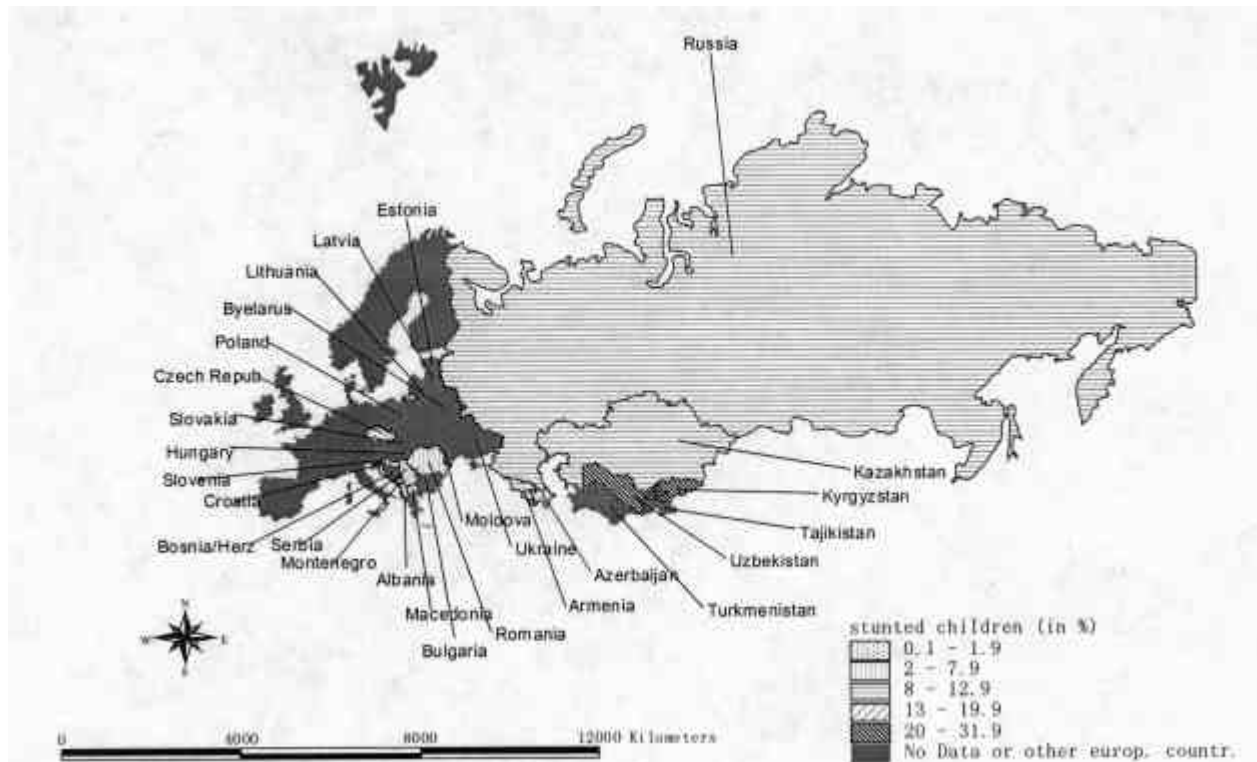
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<sup>4</sup> It may be hypothesized that undernourishment has worsened after 1995-96, when the nutrition survey was conducted in Croatia. However, food supply data do not support this assumption: according to FAO data, DES – the main determinant of variation of the percentage of undernourished – stood at 2560 kcal in 1994-96 and at 2540 in 1997-99. Another explanation for the disparity of indicators may be the preferential allocation of food to children, which has been reported from episodes of food shortage in developing countries (Ferro-Luzzi et al. 2001, Chastre et al. 2001). Surely, the reliability of data has to be questioned for countries experiencing (or having recently experienced) conflict and population displacement.



## Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

Figure 4-2: Mapping of the Prevalence of Stunting in Children in the CEEC and FSU



Source: own presentation based on data from FAO 2001

The insights that can be gained from the univariate approach followed above are inevitably quite limited. Therefore, the next section of the present chapter considers socio-economic and political indicators together with food security indicators in a multivariate regional analysis.

### Classification Analysis of Countries in Transition

The classification analysis undertaken in this chapter will address the subsequent questions:

- Which significantly different groups and subgroups of countries can be identified with reference to a set of socio-economic, political and food security indicators?
- Do the groups show distinct patterns of spatial distribution?
- Which regional linkages between food security, socio-economic and political variables can be found?

The variables chosen for the analysis, which are described next, relate to the state of food security, the level and course of economic and agricultural development, demographic changes, and to the political system of the countries under consideration.

### Selection of Variables

The selection of variables is restricted by limited data availability for the cross section of the countries under review and for the time series since the beginning of transition. The use of dynamic variables expressing the growth of GDP per capita and value added in agriculture per capita accounts for differences between countries that have emerged during the transition period.

Information on dietary energy supply per capita (DES) and the percentage of undernourished is broadly available for the cross section of countries in transition. The percentage of undernourished is essentially an inverse regressive transformation of DES, which thereby mainly determines its cross country variation (Wiesmann et al. 2000). The same data for under nourishment as in the previous section are used for the classification analysis (for the years 1997-99 from FAO 2001), and corresponding average values for DES are calculated for 1997-99 with data from FAO 2002. Unfortunately, as already mentioned, indicators of child nutrition are only available for about half of the 27 countries, and mostly for one year only, which precludes the derivation of trends for the majority of countries (WHO 2002). Therefore, nutritional indicators and their potential determinants are not considered in the cluster analysis.

With respect to economic development, GDP per capita in PPP\$<sup>5</sup> (1996-98) and the annual rate of GDP per capita growth in the period 1990-1998 are selected as suitable indicators. Due to complete lack of information on GDP, Bosnia-Herzegovina and Yugoslavia (Serbia and Montenegro) have to be excluded from the following analysis. The average annual growth rate is calculated from time series of GDP per capita data (in PPP\$)<sup>6</sup>. Likewise, the growth rate of the agricultural sector is calculated from time series of value added in agriculture per capita (VAA) (in PPP\$, calculated from the share of value added in agriculture and GDP per capita with data from World Bank 2000). It should be noted that the widespread decline of the value of agricultural production for most countries in transition does not necessarily imply a deterioration of food security. For some countries, it may be traced back to the removal of heavy subsidies for animal products and the shift to increased production and consumption of vegetable products like potato and grain, whilst maintaining the initial level of calorie supply per capita (see Sedik et al. 2002 for the case of the Russian Federation).

<sup>5</sup> Since the purchasing power of incomes in national markets is considered more important for food security than ability to buy on international markets, GDP in PPP\$ is preferred to GDP in US\$ for this present analysis (data are taken from World Bank 2000).

<sup>6</sup> The fact that these data are not available for the full range of years from 1990 to 1998 for all countries in transition (some states gained independence after 1991) necessitates the calculation of the average growth rate for only six to seven years in some instances. This may imply restricted cross country comparability, since the earliest stage of transition is not covered for a few countries.

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The degree of urbanization can be expressed by the share of the population living in urban areas. This variable is considered as a proxy for the quality of transportation and communication infrastructure as well as the outreach of public service provision. Considerable shifts of the population from rural to urban areas, or vice versa, are an indication of social upheavals. The change of the share of the rural population between 1990 and 1998 is chosen as indicator. The interpretation of such trends, however, requires a closer look at absolute changes of the urban and rural population. Shifts may arise from re-migration due to dismissal of industrial workers in urban areas and better opportunities for subsistence farming in rural areas (Kuhn and Wehrheim 1997), but also from a disproportionately higher emigration from urban areas to other countries (note that many people of Russian origin have left the formerly socialist republics after independence (CIA 2001)).

The Gastil indices are broadly available political variables which attempt to quantify a country's degree of political freedom (Gastil index 1) and civil liberties (Gastil index 2), respectively. They are seven-point country-level indices, with higher values indicating less freedom, and are based on subjective assessment. Data are obtained from the ratings published annually by Freedomhouse for the years 1996-97 (Freedomhouse 2000). Additionally, reference to the political situation and the engagement of countries in wars is made in the interpretation of the classification results (information on the duration and occurrence of wars is taken from HIIK 2000).<sup>7</sup>

### **Methodology**

A cluster analysis is carried out in the following to identify groups of countries with similar food security, socio-economic and political characteristics. Cluster analysis offers an almost confusing variety of options. The Ward method is frequently used as fusing algorithm in regional analyses, since it tends to identify the "right" groups and partitions (Kuhn and Wehrheim 1997, Backhaus et al. 2000). Yet, the Ward method is sensitive to outliers and correlated variables. Since Pearson's correlation coefficient for DES and the percentage of undernourished exceeds the absolute value of 0.90 (coefficient = -0.92, p-value = 0.000), the variables can only be used alternatively in the analysis. A combination of both indicators has not been calculated because it would hide the specific information on inequality contained in the

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<sup>7</sup> Note that the legacies discussed in Chapter 2 and 3 are reflected only partially and indirectly by some of the indicators in this cluster analysis due to the difficulties to find adequate variables. The question to which extent these legacies or their effect on food security variables can actually be quantified is addressed in another paper by the authors (Wiesmann and Wehrheim, 2003) that is available upon request.

percentage of undernourished<sup>8</sup>. In contrast, an aggregate was formed of the two political indices (i.e. the Gastil index 1 and 2) by simple adding up which yields what is called the “democracy index”. This seems mandatory because the variables for political freedom and civil liberty are likewise very highly correlated (coefficient = 0.94, p-value = 0.000). Employing the Single-Linkage procedure for different sets of grouping variables, Tajikistan (the poorest and most food insecure country) was definitely identified as an outlier, and was omitted. The variables were Z transformed prior to the analysis, and the Squared Euclidean Distance was used for measuring the distance between objects.

Discriminant function analysis is used to check the quality of the cluster analysis solution in a second step. If at least one significant discriminant function can be found for the groups under consideration with respect to the variables used for the clustering procedure (significance is tested using the multivariate Wilk’s Lambda), the null hypothesis that there is no significant difference among the groups is rejected (Backhaus et al. 2000). If significant heterogeneity of the groups was not confirmed by discriminant function analysis, the classification results of cluster analysis would be invalid. The variables with significant discriminatory power are then used in discriminant analysis for classification, comparing the results with the initial grouping suggested by cluster analysis. The membership of some country cases may change in this last step (Backhaus et al. 2000). It should be kept in mind that the classification by means of cluster and subsequent discriminant function analysis cannot be compared to more rigorous methods (such as regression analysis), since the outcomes are highly sensitive to changes in variable selection (Kuhn and Wehrheim 1997).

## Classification Results

The dendrogram (horizontal hierarchical tree plot) in Figure 4-3 shows the result of the classification with the Ward method as fusing algorithm, and the percentage of undernourished, GDP per capita, GDP per capita growth, value added in agriculture per capita growth, urbanization, change in the share of the rural population, and the democracy index as variables. Three main groups with three to four subgroups have been identified. Significant heterogeneity is confirmed for each grouping by discriminant function analysis, and the classification of countries by cluster analysis is confirmed. Except for the growth of VAA, the mean values of the

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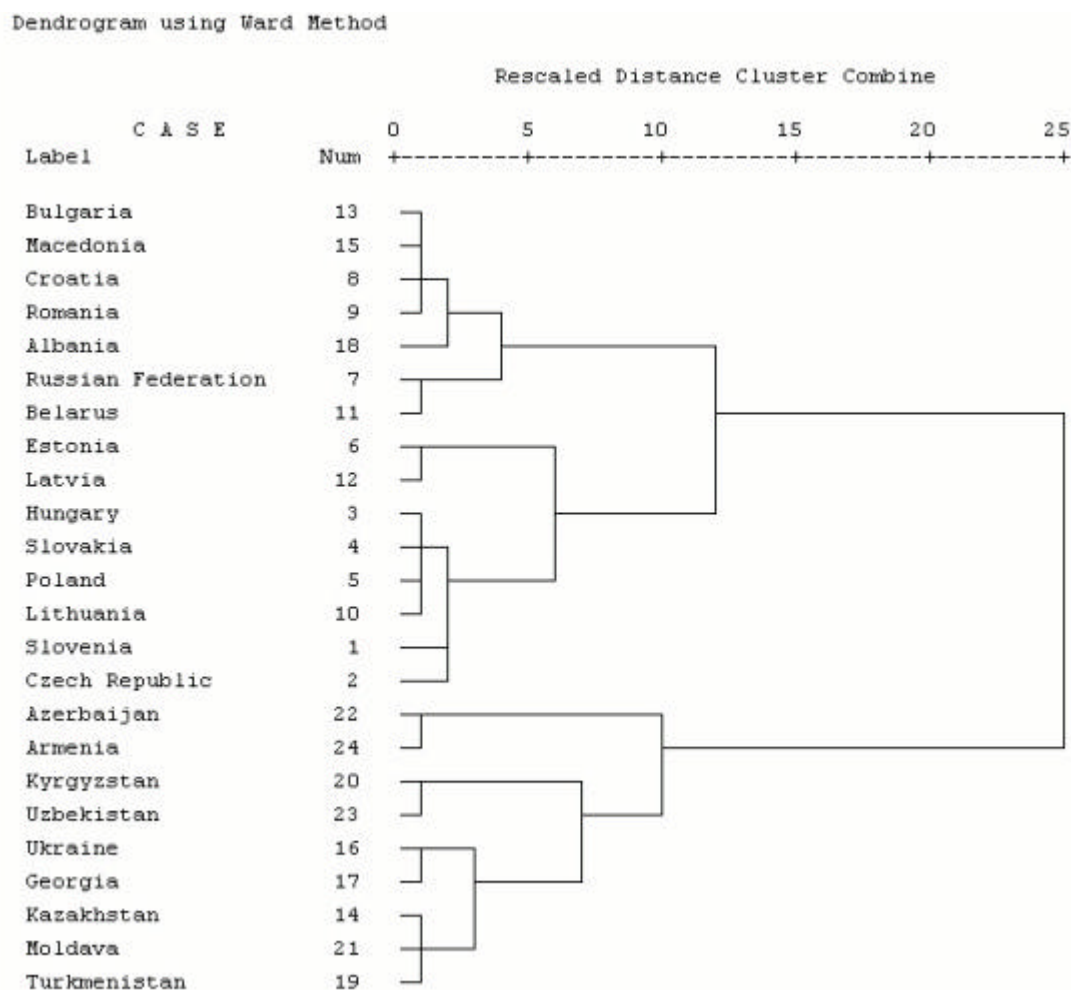
<sup>8</sup> Preference is given to the percentage of undernourished for the purpose of the present analysis, and DES is used to check the sensitivity of results. The reason is that cluster analysis relies on distance measures that are calculated from differences between variable values of distinct objects (countries, in this case). The gap between a DES of 2000 and 2500 kcal is likely to indicate a greater disparity in food security levels (e.g., a larger difference in the share of people unable to meet minimum requirements) than the gap between a DES of 3000 and 3500 kcal. If DES was used in the cluster procedure, however, the same difference of 500 kcal would enter the analysis in both cases. In contrast, due to the regressive transformation of DES implied in the estimation process, the percentage of undernourished assigns lower differences to equidistant pairs of DES values, the higher the level of DES is. For the example cited above, the difference in the percentage of undernourished would be about 25 percentage points for the first case (DES 2000 and 2500), and about percentage 2 points only for the second case (DES 3000 and 3500) according to the model presented in Wiesmann et al. 2000.

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employed variables differ significantly among the three main groups, see the results of the univariate ANOVA on the right hand side of Table 4-1.

The three groups and their subgroups are depicted in the map in Figure 4-4, which illustrates the prevailing regional patterns. The names of the sub-groups do not always correspond exactly to the geographical names of respective groups (e.g., Baltic States – Lithuania can be considered as borderline case, but is assigned to the second subgroup, see below). Note that the labels “high food security”, “medium food security” and “low food security” refer to mean values for the percentage of undernourished.

Figure 4-3: Hierarchical Tree of Classification Results for Countries in Transition



Note: On the left of the plot, each country constitutes a class by itself. Going to the right, more and more elements are linked together and larger and larger clusters of increasingly dissimilar countries are aggregated. Finally, in the last step, all objects are joined together. The horizontal axis denotes the linkage distance. The numbering of the cases expresses the country's ranking place according to GDP per capita (1 = highest, 25 = lowest).

Source: own presentation based on data from FAO 2001 and World Bank 2000

Likewise, the subgroups in the legend are listed in ascending order of the *average* percentage of undernourished. Since the clustering procedure relies not only on explicit food security indicators, but on other variables, too, some individual countries in the bottom subgroups have a lower prevalence of under nourishment than cases in the subgroups listed above (compare Figure 4-1).

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Figure 4-4: Map of the Main Clusters and Subgroups of CEEC and FSU Countries



Source: own presentation

The mean values of the variables are shown on the left hand side of Table 4-1 for the main groups. The characteristics of the groups are described in the following.

**Group 1 - High Food Security Central and Northeastern Europe:** This group is characterized by high food security, with the percentage of undernourished ranging from 1 to 4%, and by relatively high GDP per capita levels between 5420 and 13740 PPP\$. On the average, a tendency to slight economic decline can be observed (mean annual growth of GNP per capita of -0.6%), with growth rates varying between -6.2 and 3.3%. The mean change of the share of the rural population is low (-0.4%). The level of political freedom and civil liberties is relatively high according to the democracy index (mean value of 3.5).

**Table 4-1: Mean Values of Variables for Main Groups and Test for Differences of Mean Values**

	mean values of variables for			univariate ANOVA		
	Group 1 (8 cases)	Group 2 (7 cases)	Group 3 (9 cases)	Wilk's Lambda	F Statistic <sup>2)</sup>	p-value
Share of the population undernourished (in %)	2,1	7,0	15,4	0,64	5,8	0,010
GDP per capita (in PPP\$)	8.920	5.256	2.658	0,33	21,7	0,000
Annual growth rate of GDP per capita in PPP% (in%)	-0,6	-3,3	-8,9	0,35	19,2	0,000
Annual growth rate of value added in agriculture per capita (in%)	-9,5	-5,7	-11,9	0,86	1,7	0,215
Urban population (in%)	64,6	61,0	52,4	0,34	19,9	0,000
Change of the share of the rural population (in%)	-0,4	-8,2	-1,0	0,79	2,7	0,087
Democracy index <sup>1)</sup>	3,5	8,1	9,8	0,58	7,6	0,003

<sup>1)</sup> The index can vary between 2 and 14, with higher values indicating less political freedom and civil liberties

<sup>2)</sup> Degrees of freedom: df1 = 2, df2 = 21 (total number of cases = 24)

Source: own calculation based on data from FAO 2001, World Bank 2000 and Freedomhouse 2000

The classification results of cluster analysis imply the existence of three distinguished regional subgroups (compare Figure 44). Slovenia and the Czech Republic are the two countries which have succeeded to recover from the initial transition shock most significantly. Therefore, in Group 1, they are outstanding among the countries in transition due to their high GDP per capita (13740 and 12580 PPP\$, respectively). Food security is respectively high, indicated by a percentage of undernourished of about 1% only. In contrast, for the second subgroup (Poland, Lithuania, Slovak Republic and Hungary), the level of GDP per capita is lower - ranging from 6100 to 9750 PPP\$ - and the percentage of undernourished ranges between 1 and 3%. The average GDP per capita for the third subgroup, consisting of Estonia and Latvia, is even lower than for the second group (6320 PPP\$), though Estonia's GDP per capita exceeds that of Lithuania<sup>9</sup>. There is slightly higher food insecurity in Estonia and Latvia than in the other countries of Group 1, with a share of 4% undernourished for both states.

<sup>9</sup> As already mentioned, Lithuania can be considered as a borderline case between subgroup 2 and 3. If discriminant function analysis is run for merely two subgroups of Group 1 (Hungary, Slovakia Poland, Lithuania, Slovenia and Czech Republic on the one hand and the more distant countries Latvia and Estonia on the other) the percentage of undernourished is identified as relevant discriminatory variable. Lithuania, for which the share of undernourished is estimated to be 3%, is then assigned to the subgroup with Latvia and Estonia by discriminant function analysis.



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**Group 2 - Medium Food Security Balkan and FSU Countries:** The countries in Group 2 are, on the average, less food secure than the states in Central and Northeastern Europe in Group 1: the mean value of the percentage of undernourished amounts to 7%. Most evidently this lower level of food security is associated with a GDP per capita that is significantly lower than for Group 1 (the mean values are 5260 and 8920 PPP\$, respectively). In contrast to that group, consistently negative growth rates of GDP per capita are observed for Group 2, ranging from -1,3 to -7% per year. Hence, the speed at which the countries recovered from the initial transition shock seems to be key in explaining inter-country differences with respect to food security. Furthermore, in this group the share and also the absolute size of the rural population have decreased in all countries with a mean change of the share of -8.2 %. A higher average value of the combined democracy index (7.0 as compared to 2.1 for Group 1) indicates that Group 2 experiences less political freedom and civil liberties than the first main group<sup>10</sup>.

Belarus and the Russian Federation, which constitute the subgroup with the most favorable food security situation within Group 2 (mean value of 3.5% percent undernourished) have experienced large declines in agricultural net production of -12.7% on the average, and also in the share of the rural population (-12%). Similar trends in these two variables (-4.5% and -6.5%) show up for Romania and the Balkan countries with available data (Croatia, Macedonia, Bulgaria) though the rates of decline are consistently lower. Food insecurity is higher on the average (8% undernourished) than in Belarus and the Russian Federation, which can be at least partly attributed to the destabilizing effects of conflict in the region. However, again it has to be stressed that the Russian Federation, as the biggest country in the world is characterized by substantial inter-regional differences. Albania is a somehow exceptional case, because it has experienced positive growth of VAA. It is the country with by far the lowest GDP per capita in Group 2, and despite agricultural growth and an increase in dietary energy supply per capita since the beginning of transition, undernourishment was estimated to be 10% for 1997-99. Here the relatively far reaching privatization and distribution of land and the low opportunity costs of working in agriculture have been associated with substantial intensification of land use while the general economic development has been very negative.

**Group 3 - Low Food Security Southeastern European and Asian FSU Countries:** The countries assigned to the third group are exclusively from the FSU, namely, from the Southeast European and Central Asian region. On the average, food insecurity is highest in Group 3 (15.4% undernourished). The mean value of GDP per capita (2660 PPP\$, with Tajikistan excluded) is markedly lower than for the other two main groups of countries, and the

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<sup>10</sup> In this context it should be noted that Belarus and Romania, that are outliers in Group 2 with respect to their high level of food security (the percentage of undernourished is only 1%), are the least democratic countries in this group. This finding raises some questions: is less political freedom associated with weaker and possibly faked statistics? Have less democratic countries in transition chosen a gradual reform path and transformed their economies to a lesser degree, reduced general subsidies less than more liberal states, thereby maintaining a tighter control over food prices, and protecting food consumption? We hypothesize that it is a mixture of both phenomena which is responsible for the counter-intuitive correlation of higher food security and lower political liberty.

highest average rate of economic decline is observed. No remarkable decline of the share of the rural population has taken place on the average even though it is still comparatively high in some of these countries. Furthermore, a higher democracy index for Group 3 (9.8) as compared to the other two main groups indicates relatively less political freedom and civil liberties.

The subgroup with the highest average level of food security consists of the Kyrgyz Republic and Uzbekistan (mean value of 7% undernourished). Both countries are characterized by low incomes (around 2120 PPP\$) and increases in the share of the rural population by about 5%<sup>11</sup>. Another subgroup comprises Georgia, Ukraine, Kazakhstan, Moldova and Turkmenistan. The percentage of undernourished is slightly higher for this subgroup despite higher average incomes (mean value of 3130 PPP\$). The most food insecure subgroup in Group 3 and the total sample consists of Armenia, Azerbaijan and Tajikistan<sup>12</sup>, with the percentage of undernourished varying from 35% to 47%. The level of GDP per capita is low, with an average of only 2020 PPP\$ for Armenia and Azerbaijan. (The mean value is lowered to 1660 PPP\$, if Tajikistan with a GDP per capita of only 940 PPP\$ is also considered.)

Concluding, the exclusive classification of countries in transition has served for identifying similar transition countries with respect to their food security status and has revealed distinct geographical patterns. The following comparative analysis of countries in transition and developing countries is meant to shed light on differences with respect to food security, and on the implications of these differences for the analysis of food security in countries in transition.

### Comparative Classification of Countries in Transition and Developing Countries

Because we have argued in chapter 2 that the legacies from socialism are responsible for some distinct differences between countries in transition and developing countries, we will now discuss the results of a joint cluster analysis of both country groups, which addresses the following research questions:

- Which country groups can be identified based on a mixture of socio-economic, political, and food security indicators?
- How are the countries in transition spread over these groups?

<sup>11</sup> The quite favorable food security situation suggested by the FAO data seems to contradict with the finding that among countries in transition with data on child malnutrition in the decade 1991-2000, the Kyrgyz Republic and Uzbekistan have the highest prevalence rates of stunting (compare the maps in Figures 4.1 and 4.2). Beside health and care factors, however, the heavy environmental contamination of some regions in these two countries (ZEF 2002, Moldogazieva and Spoor 1997) might also have a negative impact on children's growth.

<sup>12</sup> Tajikistan was identified as an outlier and was omitted in the clustering exercise to avoid a distortion of classification results. However, discriminant function analysis offers the option to classify this outlier country ex post by calculating the probability for its membership in each of the existing groups. Tajikistan is unanimously assigned to Group 3 and the subgroup consisting of Armenia and Azerbaijan.

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- Are there any significant differences between countries in transition and developing countries which are grouped in the same cluster?

The same variables and methodology<sup>13</sup> as in the above section are applied. Data are available for 25 countries in transition (see Table A-1 in the Appendix) and 83 developing countries.

### Classification Results

Two main categories of countries with almost equal size are identified by cluster analysis. The first category (comprising 57 countries) has a much lower level of food security, lower GDP per capita, lower democracy, and urbanization than the second one, which consists of 51 states. Except for Azerbaijan, Armenia, Uzbekistan, Kyrgyzstan, and Albania, all countries in transition have been assigned to the better off second category. Going beyond this very general characterization, three distinct subgroups in the first category and four in the second category are worth closer consideration. The mean values of the employed variables for these seven groups, which are described next in more detail, are shown in Table 4-2. In the following we will describe the seven subgroups which have been identified.

The **first group** is characterized by the highest degree of food insecurity and the lowest GDP per capita among all seven groups. GDP growth is negative on the average, and democracy and urbanization are significantly lower than in the rest of countries. Typical representatives are Burundi, the Democratic Republic of Congo (the former Zaire), Angola and Haiti. Sierra Leone, Ethiopia, Niger and Yemen, are also found in this category. Only one country in transition is assigned to this group: Azerbaijan, although its percentage of undernourished is lower than the average of group 1. Yet, significant differences to the rest of the group are only identified for GDP per capita and urbanization (which are higher for Azerbaijan), and for GDP per capita growth and growth of value added in agriculture (which are much more negative for Azerbaijan). Azerbaijan is still the country with the second highest GDP per capita in the first group and has obviously arrived at the present state of food insecurity on a completely different path. It has the most negative growth rate of GDP per capita (-11%), followed by other war-torn countries (Democratic Republic of Congo -8%, Sierra Leone -8% and Burundi -5%), indicating that the effects of civil upheaval are similarly negative with respect to food security in transition countries as in developing countries.

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<sup>13</sup> Eritrea, Ghana and Tajikistan were identified as outliers by means of the Single-Linkage procedure. They were omitted from the cluster analysis using the Ward method, but were assigned to the distinct groups according to the result of discriminant function analysis later. In contrast to the above analysis referring to countries in transition only, some countries in the initial cluster analysis were classified differently by the subsequent discriminant function analysis (8 out of 105 countries). The group membership suggested by discriminant function analysis was finally used.

The mean GDP per capita of the **second group** is almost double than that of the first group, but still significantly lower than for the rest of countries. The growth of value added in agriculture is significantly higher than for all remaining countries, and on the average, the group is the least democratic one. Typical representatives are Uzbekistan, Sudan, Cameroon and China. Four countries of transition fall into this group of 22 countries altogether: Albania, Armenia, Kyrgyzstan and Uzbekistan – the latter three had been assigned to the “low food security group” solely composed of countries from the FSU region in the analysis of transition economies. The annual change rate of GDP per capita is significantly less favorable for the four transition countries (-5% on the average) than for the 18 developing countries (+1%), and there is a significantly lower decrease of the share of the rural population with -1% as compared to -8%. It is noteworthy, that with the exception of Kyrgyzstan all transition countries in this group including China have chosen a gradual reform path and are also slow reformers with respect to agriculture. Albania, Armenia and Kyrgyzstan are the only countries in transition for which the share of value added in agriculture (as % of GDP) has increased from 1990 to 1998 (and for Uzbekistan, it has fallen by only 2 percentage points in this period).

**Table 4-2: Mean Values of Variables for Main Groups Identified in the Joint Cluster Analysis for Developing and Transition Countries**

Group	1	2	3	4	5	6	7
	Poorest, most food insecure DC with negative trend	Poor, food insecure stable DC and TC	Poor to middle income, food insecure DC with positive trends	Middle income, rather food insecure TC with extreme negative growth	Mixed higher income, relatively stable DC and TC	Relatively food secure, high income growing DC	Food secure, high income European TC and DC
Number of countries	20	22	15	10	23	8	10
Share of the population undernourished (in%)	46	18	24	13	10	4	6
GDP per capita (in PPP\$)	1.056	1.944	2.330	3.758	4.757	7.747	8.581
Annual growth rate of GDP per capita in PPP% (in%)	-2,0	-0,1	2,0	-7,8	0,0	2,7	1,0
Annual growth rate of value added in agriculture per capita (in %)	-3,3	0,5	0,0	-18,3	-2,3	1,2	-4,6
Democracy index <sup>1)</sup>	10,4	10,9	6,3	8,2	8,0	7,3	3,3
Urban population (in %)	29	41	27	55	62	83	59
Change of the share of the rural population (in %)	-5,6	-6,5	-4,9	-0,7	-11,5	-24,3	-4,5

Notes: <sup>1)</sup> The index can vary between 2 and 14, with higher values indicating less political freedom and civil liberties

Source: own calculation based on data from FAO 2001, World Bank 2000 and Freedomhouse 2000

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The **third group** consists only of developing countries, has a slightly higher mean GDP per capita than the second group, but less food security on the average. Its distinctive characteristics in comparison to countries in other groups are a lower GDP per capita combined with higher GDP and agricultural growth, more democracy and lower urbanization.

Mali, Nepal, Thailand and India are most typical for this group<sup>14</sup>. Relatively high scores for democracy and a strong GDP per capita growth at a comparably low mean income level may explain why no countries in transition have been assigned to this group. The poorer countries in transition (Armenia, Uzbekistan, Azerbaijan, Moldova, Kyrgyzstan, Turkmenistan, Albania, Georgia, Ukraine, Macedonia and Kazakhstan) with an average GDP per capita of 2800 PPP\$ are characterized by negative economic growth (-8%) and a worse democracy score (9) than the developing countries in the third group.

In contrast, the **fourth group** is almost exclusively composed of countries in transition. The relevant features that distinguish the countries in this group from those in the other six groups are the considerable downward trends in GDP per capita and value added in agriculture in the 90s, as well as higher stability of the rural population. The level of GDP per capita is about the average of all 108 countries under consideration. All countries in this group have been assigned to it with high probability (probabilities over 0.95 for group 4 according to discriminant analysis). The most typical representatives, however, are Kazakhstan, Latvia, Moldova and Turkmenistan; other countries in transition included are Estonia, Ukraine, Georgia, the Russian Federation and Tajikistan. Ghana and Tajikistan, which were first omitted from the cluster analysis due to their outlier status, were assigned to the present group by the subsequent discriminant analysis. Ghana is the only developing country in group 4, and the sole significant difference to the other 9 countries in the group consists in Ghana's positive GDP per capita growth, which is in sharp contrast to the negative trend for the transition countries. However, a similarity is Ghana's shrinking agricultural sector (-16% annual change rate). For Ghana with its overall growing economy, this trend is yet to be judged differently than for the countries in transition: it indicates a quick structural change towards the industrial and service sector, as it is commonly observed in the course of development. All nine countries in transition in group 4 are from the FSU, and were predominantly assigned to the "low food security" group in the exclusive analysis of transition countries.

In the **fifth group**, 5 countries in transition are represented together with 18 developing countries. Food security, GDP per capita and urbanization are significantly higher than for the remaining countries in the sample. Typical for this group are Belarus, Ecuador, Jordan, Venezuela and Colombia. The developing countries and countries in transition (Belarus, Bulgaria, Croatia, Macedonia, Romania) within this group do not differ significantly in percentage of undernourished, GDP per capita, democracy and urbanization. But again, there is a

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<sup>14</sup> It may seem odd that Thailand (GDP per capita 5970 PPP\$) is found in the same group with such a poor African country as Mali (GDP per capita 670 PPP\$). However, despite obvious differences in income, all four above-mentioned representatives of the third group fall into the same range of food insecurity with a percentage of undernourished between 20 and 30%.

gap in the development of the overall economic and agricultural production: whereas the annual change rates for GDP per capita and value added in agriculture for developing countries in group 4 are +1% and -1%, respectively, the corresponding averages for the five transition countries amount to -3 and -6%. Furthermore, the pace of urbanization is slower in transition countries, since the share of the rural population diminished by -8% from 1990 to 1998 only compared to -13% for the developing countries. Except for Belarus, the countries in transition in group 5 are from the “Balkan countries and Romania” subgroup with medium food security according to the cluster analysis in the previous section.

The **sixth group** is composed of advanced developed countries only. They are characterized by the highest average level of food security, the highest economic and agricultural growth rates and urbanization (compare Table 4-2). None of the countries in transition matches this combination of characteristics. Saudi Arabia, Gabon, Argentina, Turkey and Lebanon are typical for this group.

The **seventh group** is again a mixed one and achieves the highest GDP per capita and most favorable democracy score among all groups. Slovenia, the Czech Republic, and Hungary are typical. Except for Latvia and Estonia, all countries of the “high food security Central and Northeastern Europe” category are in group seven (including also Poland, Lithuania and the Slovak Republic). In addition, Costa Rica, Mauritius, Trinidad and Tobago and Botswana have been assigned to this group – Botswana, however, is rather non-typical. Significant differences between countries in transition and developing countries are found for the percentage of undernourished (1.5% as compared to 12%), GDP per capita (9800 vis-à-vis 6800 PPP\$), and the change rate of value added in agriculture (-7% versus -1%). The countries in transition in this last group do better with respect to food security and income level than the developing countries, although they have faced a considerable decline in the agricultural sector since the beginning of the nineties. Yet, in contrast to the groups of transition economies discussed previously, the part of the Central and Northeastern European region discussed here has managed to compensate this trend by a faster recovery of other sectors. Thus, overall economic growth is still slightly positive for the transition countries in group 7 (+0.5%).

## Conclusions from Cluster Analysis

In spite of the vast differences between the countries - particularly with respect to their size - the cluster analysis has yielded a relatively clear geographical pattern of food insecurity in the transition countries included in this study. On the one hand there is a trend of increasing food insecurity the further east one gets in the region. On the other hand the countries along the southern rim of these country group are at higher risk of being food insecure. Economic development seems to be the single most important factor contributing to food security while

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civil upheavals and war are the major factors which contribute to higher levels of food insecurity<sup>15</sup>. Thus, we find the same basic causes of food insecurity as in developing countries.

In a joint cluster analysis of transition and developing countries, the groups of countries in transition identified previously are largely coherent. However, these groups are spread over five of seven country clusters altogether, leading to mixed groups with developing countries, which shows that even in a synopsis with developing countries, countries in transition are by no means homogenous. It is noteworthy that Azerbaijan ends up in the poorest and most food insecure group of developing countries, whereas the gradual reformers Albania, Armenia, Kyrgyzstan and Uzbekistan are assigned to an also low income, non-democratic group, which has, however, a more prosperous agricultural sector and higher food security. No country in transition is found among the relatively democratic, low to middle income group with strong economic growth, which has not yet achieved a high level of food security, but future prospects are favorable. In contrast, the distinctive characteristic of a group that is almost exclusively composed of countries from the FSU region, including the Russian Federation, is an alarming decline of overall economic output and the value added in agriculture. The Balkan countries are assigned to a mixed middle income group. No country in transition is assigned to the group with high income and food security coupled with strong economic and agricultural growth and a share of the urban population of more than 80% on the average, because the CEEC and FSU obviously do not match these characteristics. The wealthiest and most democratic group is mainly composed of the Northeastern and Central European countries in transition with high food security.

Significant differences between countries in transition and developing countries in the mixed groups mostly exist with respect to GDP growth, which is predominantly in the negative range for the former, and the change of the share of the rural population, which indicates less population shifts in the CEEC and FSU. The extent of economic downturn in transition countries highlights that they have arrived at similar levels of food insecurity as many developing countries on a different path. The relatively slow urbanization trend in transition economies indicates that migration to the cities seems to be a less preferred option than in developing countries. In fact, both the rural and the urban population in transition countries still enjoys a higher coverage of public service provision, better health and educational indicators than people in developing countries at comparable income levels (although current trends suggest that these achievements may not be sustainable). The high number of private garden plots for subsistence production in rural areas and high unemployment in urban centers may be further obstacles to migration in transition countries.

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<sup>15</sup> This view, that is derived from the classification results of the clustering procedure, is confirmed by a methodologically more rigorous type of analysis: multivariate regression analysis. The logarithm of GDP per capita (in PPP\$) and a dummy variable expressing the engagement of countries in wars during the transition period are significant explanatory variables for the percentage of undernourished. They account for about 70% of the variation of the dependent variable (adjusted R-squared = 0.69).

## 5 Summary, Conclusions and Research Agenda

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Our analysis revealed that food insecurity is a concern of some but not all transition countries. In regions, where war, political instability and poor governance prevented a speedy recovery from the initial shock of the transition process and the initial level of GDP per capita was low, food insecurity is a general threat and might become a chronic phenomenon as in developing countries that are faced with similar problems. In most other transition countries food security is rather a transitory phenomenon instead.

Due to the fact that similar factors seem to determine food security in transition countries by and large as in developing countries we argued that food security analysis for transition countries should rely on a similar conceptual framework. Nevertheless patterns, levels and trends of food insecurity in transition countries often are different from those in the developing countries. We argued that these differences can be mainly explained by *legacies* of the socialist era. Therefore, the conceptual framework of food security analysis in transition countries ought to be extended to take this phenomenon into account.

The next question that follows from our analysis is “What must be done to reduce the food insecurity that persists or is even increasing in some of the transition countries?” On the whole, the best policy against food insecurity appears to be rapid economic recovery from the recession of the early transition phase and ending war or civil unrest. Growth and ending war are not enough, however: it must be accompanied by the building up of more efficient and more market-oriented institutions and of sound social security systems based on efficiency and effectiveness. However, in various situations the measures listed so far might not be sufficient for a timely reduction of food insecurity in all transition countries. In such cases targeted policies directly designed to combat food insecurity of specific population groups must be employed wherever it has taken root during the process of transition. Because national budget constraints and poor public governance are factors which often prevent the development of such targeted policies from within the respective countries, the international donor community should continue to offer well targeted food aid whenever needed.

One of the most essential needs to reduce food insecurity in the transition countries, however, will be the reduction of remaining knowledge gaps. In this context the following knowledge gaps seem to be most relevant:

- *Data availability* generally is a problem. For instance, in order to better judge the impact of food security on child nutrition in Tajikistan, anthropometric data would be essential. However, food insecurity is a rather new phenomenon in that region and did not receive



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much attention in the past. The lack of respective data seems to be higher the more severe the situation of food insecurity in the respective countries is (examples are Tajikistan and Moldova).

- *Analysis of legacies contributing to food insecurity.* It remains a matter of analysis to answer the question by what mechanisms and even more importantly to which extent legacies from the socialist period contribute to food (in-)security in the transition countries. Therefore a systematic and quantitative assessment of these legacies particularly with micro-economic studies would help to understand the evolution of food security in these countries better.
- *Food insecurity in countries engaged in warfare and instability.* War and civil unrest can not be neglected in this region. In fact, the countries in the region that are worst affected by undernourishment have experienced episodes of warfare and political instability since their independence (Armenia and Azerbaijan, Tajikistan). Additionally, poor public governance and underdeveloped public infrastructure (high vulnerability against natural disasters like drought) for example contribute to the high levels of food insecurity in Turkmenistan and Tajikistan. At the same time it is most difficult to obtain the relevant information on who the food insecure are in these countries and how they can be reached while public governance structures are not functioning.
- *Analysis of forms of food insecurity.* Our analysis indicated that in most transition countries food insecurity is not so much a matter of caloric intake being below minimum requirement levels. Food security in the Russian Federation, for instance, is rather a matter of malnourishment if a concern at all. According to a study conducted in selected regions of Russia, only the poorest of the poor cannot meet their dietary energy requirements. However, micro-nutrient malnutrition and over-nutrition are much more prevalent in Russia than under nutrition (Sedik et al. 2002).
- *Identification and targeting of the vulnerable groups.* Analyses of food insecurity at the household level are particularly scarce. While national data often suggests that availability of food is not a significant problem in many transition countries food security of specific socio-economic groups might have been negatively affected by the transition process, (and together with other factors like an increasingly limited access to health care and frequent infections, this might have had particularly adverse effects on the nutritional status of children, compare the case of Uzbekistan). Because of growing inequality and increasing difficulties to sustain adequate access to food some groups are likely to be much worse off than they were before.
- *Analyses of malnutrition among children.* In some countries of the FSU and few in southeastern Europe child malnutrition is a severe issue. While causes and symptoms of

child malnutrition in transition economies are relatively similar to those of many developing countries, the factors contributing to the level of child malnutrition are less clear. For instance, on the one hand comparatively high levels of female education in the countries of the FSU have prevented more severe under nutrition of children in the toughest economic period. On the other hand, factors such as extremely adverse ecological conditions seem to be one major reason for child malnutrition in Uzbekistan.

- *The role of subsistence farming in reducing food security in transition countries.* While subsistence farming is often said to be a vicious cycle of the transition process, one of its most obvious benefits is its role as a buffer against food insecurity. In fact, in those regions where poverty is likely to persist in the medium run, support for subsistence farming might have the potential to reduce food insecurity substantially.

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# Food Security in Transition Countries: Conceptual Issues and Cross-Country Analyses

## Appendix

Table A-1: Selected Socio-Economic Indicators Relevant for Food Security Analysis in Transition and Developing Countries (Data Base for Cluster Analysis in Chapter 4)

	percentage of under- nourished	GDP per capita, in real 1995 terms	annual growth rates		democracy index <sup>1)</sup>	demographic indicators	
			GDP per capita growth	value added in agriculture per capita growth		urban population	change of the share of the rural population
	(in %) 1997-99	(in PPP\$) 1996-98	(in %) 1990-98	(in %) 1990-98		(in %) 1997	(in %) 1990-98
Albania	10	2.769	-1,3	3,6	8	39,9	-6,8
Armenia	35	2.016	-7,5	0,2	9	69,2	-6,0
Azerbaijan	37	2.029	-11,2	-12,0	11	56,3	-5,0
Belarus	1	5.724	-2,7	-9,4	12	70,3	-12,8
Bosnia-Herzeg.	4	--	--	--	10	41,7	-4,9
Bulgaria	11	4.805	-3,2	-2,6	5	68,6	-7,3
Croatia	15	6.520	-2,0	-3,8	8	56,6	-6,4
Czech Rep.	1	12.579	-2,0	-9,2	3	74,6	0,7
Estonia	4	7.219	-2,1	-13,3	3	69,4	6,9
Georgia	18	3.186	-12,5	-14,6	8	59,3	-8,5
Hungary	1	9.747	-0,4	-12,3	3	63,4	-4,2
Kazakhstan	11	4.374	-6,3	-20,4	11	56,4	1,4
Kyrgyzstan	10	2.226	-7,1	-3,6	8	34,3	5,5
Latvia	4	5.420	-6,2	-22,5	4	69,1	4,0
Lithuania	3	6.099	1,2	-5,8	3	68,2	-1,5
Macedonia	5	4.195	-3,7	-6,4	7	60,7	-8,0
Moldova	10	2.060	-9,4	-17,6	7	46,1	1,5
Poland	1	7.260	2,0	-4,7	3	64,5	-8,0
Romania	1	6.127	-2,9	-5,4	10	54,3	-4,5
Russian Fed.	6	6.655	-7,0	-16,1	7	76,6	-11,5
Slovakia	2	9.296	-0,5	-6,8	6	57,2	-1,7
Slovenia	1	13.739	3,3	-1,7	3	50,2	0,2
Tajikistan	47	939	-12,1	-27,7	14	27,5	6,2
Turkmenistan	9	2.766	-12,9	-18,5	14	44,6	0,8
Ukraine	5	3.249	-10,1	-16,3	7	67,6	-2,6
Uzbekistan	4	2.018	-2,8	-4,6	13	37,9	4,3
Yugoslavia	5	--	--	--	12	51,7	-2,0

Notes: <sup>1)</sup> The index can vary between 2 and 14, with higher values indicating less political freedom and civil liberties.

Source: World Bank, 2002.

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