ANNEX II

Measurement of Skills for People in Rural Transformation

Skills policies that are effective in supporting rural transformation need to be based on sound evidence. This annex sets out a conceptual framework for the development of instruments to measure skills for people in rural transformation. It describes both the traditional measurement instruments presently available, and a new tool for the direct assessment of skills currently being developed at the international level. It concludes by discussing the need for a strategic approach to skills policy-making and implementation based on evidence from measurement instruments suggested in this chapter.

I. A Conceptual Framework for Measuring Skills in the Context of Rural Transformation

A broad range of measurement instruments is necessary to guide skills policies for rural transformation beyond a simple estimation of the stock of skills (expressed in terms of educational attainment) available to an economy at any given point in time. It is important to think of skills for rural transformation as involving both the supply and the demand side perspective. The conceptual framework for the measurement of skills therefore needs to cover several dimensions as presented below (Figure A2.1).

There are various sources for the supply of skills comprising the education and training system as well as migration of skilled workers and participation in the labour market. The demand for skills on the other hand is affected by a number of factors. Skills measures also need to consider the match of skills demand and supply which in turn will have an impact on economic performance as well as on
individual economic and social outcomes. Finally, there are a number of contextual factors underpinning skills development which vary from one country to the other and need to be taken into consideration in the design of skills measures.

II. Development of Realistic and Targeted Skills Measures for Rural Transformation

Ideally, measures of skills should comprise all dimensions set out in the conceptual framework. However, different countries are in different phases of their development trajectories and capacities to collect and analyse skills data vary accordingly. The challenge for many developing and emerging countries is to establish a statistical infrastructure to ensure that the range of statistics needed for policy purposes are collected on a regular and timely basis. Then they can gradually move to the collection of more complex data that are comparable internationally.

Recognising this need to build up capacity to gather data, the G20 leaders have endorsed the development of an Action Plan which aims to provide a basic indicator framework for monitoring skills issues that should guide least developed countries in the development of their statistical collections according to a set of realistic criteria over the next years (Box A2.1).

International organisations (OECD, UNESCO, ILO and The World Bank) are jointly committed to working towards the implementation of this Action Plan and a stepwise improvement of the skills data in least developed countries. As a first step some of these indicators might need to be developed at the national level but with the later aim to link them to international data collection in order to allow benchmarking.

Furthermore, as mentioned in this report (chapter 1), one of the serious obstacles to the analysis of rural-urban differences regarding to skills relates to the lack of disaggregated data. Therefore, in order to make measures of skills meaningful for the purpose of rural transformation, it is essential that data collection is designed to provide reliable estimates for rural areas.

III. Skills Supply

The domain of skills supply has several dimensions. The first dimension covers the stock of human capital in the economy which has been acquired through past investments in skills through education and training as well as the future supply of skills derived from ongoing investments in skill formation. Not all of this investment in education and training takes place through formal channels. In many developing and emerging economies, skills are often acquired informally, on the job and through experience. This has to be taken into consideration when assessing the skills supply. In addition, other factors affecting skills supply in rural areas, in particular, immigration and emigration, movements of population between regions and the level of labour force participation should equally be considered in a comprehensive framework.

Box A2.1 Criteria for the Development of Skills Indicators in Least Developed Countries

- Relevance. The indicators should furnish information that provides a useful comparative backdrop for assisting developing countries, particularly least developed countries (LICs) to identify priorities for skills development and to monitor the impact of their strategies in this regard.
- Feasibility. The focus of the indicators should be on those for which data are available for a reasonable number of countries from existing international and national data collections; or that are feasible to generate from (low-cost) new data collection initiatives and/or modifications to existing surveys.
- Comparability. The indicators should be internationally comparable in concept and measurement. This criterion rules out the use of a number of potential sources such as national employer surveys which are rarely implemented in a comparable way across countries.
- Timeliness. The indicators should include those for which data are available or can be collected for a recent year such that the current or future situation in each country is represented in a reasonably accurate manner.

Skills development through education and training

The traditional measure to assess the stock of skills available to the economy is educational attainment in the population. In most countries, including developing and emerging economies, labour force and other household surveys provide basic information on the proportion of population by gender and age group at each level of education. However, to be meaningful for the purpose of developing skills for rural transformation, data needs to be disaggregated by region because typically, the gap between rural and urban educational attainment is high and a national average hides important local variation.

In addition, measures of current enrolment in education and training at different levels, including primary, secondary, post-secondary or tertiary education as well as participation in adult education and training provides information on the kind of skills which will be available to the economy in the near future. More comprehensive data sets provide additional levels of detail, for instance data which distinguishes between the different orientations of post-compulsory education and training programmes (general vs. vocational) and the field of study (e.g. science and technology).

Quality of education and training provision

The Millennium Development Goals for developing countries refer, amongst other things, to participation in education and aim for universal primary education by 2015. Many countries have made considerable and indeed successful efforts to reach this goal. As a consequence, enrolment in education and educational attainment has risen substantially over the last decade. However, assessing the quantity of education is not enough: more schooling (meaning more years of education or higher levels of education qualifications attained) does not necessarily mean more learning (i.e. more skills), and a certain share of students in developing countries and emerging economies, in particular in rural areas, might leave primary school without actually being literate.

What is more, one of the reasons why students in rural areas do not enrol in education in the first place or drop out prematurely is the poor quality of the education they receive. Hence, the provision of poor-quality education can constitute a significant barrier to learning. In rural areas in particular, parents prefer encouraging their children to work rather than sending them to poor-quality schools which do not provide them with a strong learning benefit.

Poor motivation of teachers leads to teacher absenteeism and ill-equipped schools deteriorate the quality of schooling. Measures with respect to student-teacher ratio, teacher absenteeism and learning conditions (school infrastructure and availability of learning material) add important information on the quality of education provision. Thus, ultimately only a direct assessment of skills can provide a meaningful measure for the quality of skills supply.

Towards a direct measure of skills

Measures of skills presently available and used in OECD countries as well as developing and emerging economies focus primarily on quantitative proxies for skills such as years of education or the level of qualification attained. However, these quantitative measures are based on the assumption that each additional year of education adds the same amount of skills in all countries and that qualifications acquired in different countries equip people with exactly the same amount of skills. They also ignore the fact that skills can be acquired informally and outside the education and training system through work experience and that skills decline over time if they are not used.

Recognising the limitations of these approaches, methods have been developed to assess skills directly. In the past, school level direct assessments (including PIRLS, TIMMS, SAQMEC and PISA) have been used to test performance of pupils at different ages in foundation skills, in particular literacy, numeracy and sciences. The OECD PISA study (Box A2.2) is the most comprehensive study having so far been carried out every three years over the period of a decade and covering now more than seventy countries, including a number of emerging economies. The results of these studies give an indication of the skills of new entrants to the labour force in many countries where progression beyond school is low.

In addition, OECD is currently developing a method to
assess skills in the adult population thus contributing to the understanding of how skills are acquired, used and translate into economic and social outcomes. While these methods are complex and resource intensive, they increase our knowledge on skills considerably and can set standards for future development of skills measures also for developing countries. This section explains how a direct measure of foundation skills as envisaged by OECD’s Programme for the International Assessment of Adult Competencies (Box A2.3) can complement existing evidence as described above to support the development of effective skills policies.

Assessing foundation skills on a continuum

PIAAC focuses on a limited set of general skills, not including an assessment of a broad range of occupation specific skills necessary for rural transformation (as set out in chapter 2). However, the survey is based on a broad conception of literacy as a foundation skill which can add complementary value to a simple binary measure of literacy or illiteracy.

First, literacy – defined in PIAAC as “the ability to understand and use information from written texts in a variety of contexts to achieve goals and further develop knowledge and potential” – is a skill, along with numeracy and problem solving, which provides a foundation for the development of other higher order cognitive skills as well as constituting a pre-condition for gaining access to and understanding of specific domains of knowledge.

Second, it provides a foundation for acting in an extremely broad range of contexts, from education through work to everyday life. Literacy is also viewed in PIAAC as an enabling skill. Literacy is valuable and valued because it enables people to do things. In other words, literacy is not seen as an end in itself but as a means by which people realise goals and achieve their aims in the various contexts (i.e. home, education, civil society and work) in which they...
act. PIAAC thus does not seek so much to measure knowledge as the ability to appropriately use information in context.

Moreover, PIAAC conceives literacy (as well as numeracy and problem solving) as a continuous range of proficiency involving the mastery of increasingly difficult cognitive operations as well as the ability to respond appropriately to texts containing increasingly complex features. In other words, PIAAC treats literacy as a skill that one can have more or less and does not try to define a threshold which distinguishes literacy from illiteracy. The downside of such a binary definition is that a share of 100% literacy is easily reached when people have acquired basic literacy skills. However, this does not tell much about how well these people are equipped to operate in more complex situations. A continuous scale in contrast allows the assessment of the level of skills on a scale and to track developments from a low skills equilibrium towards a higher skills equilibrium which is what rural transformation aims to achieve.

In reporting results, PIAAC will use a framework which defines five levels of proficiency and describes the features which distinguish proficiency at each level. Therefore, the information provided by PIAAC will go well beyond knowing the proportions of the population regarded as illiterate and literate. It will be possible to identify the proportion of the population, for example, who are accomplished readers and are fully equipped to handle complex information processing tasks.

At the other end of the scale, it will be possible to identify the proportion of adults who possess basic skills but struggle with coping with many of the reading tasks required to function effectively in modern society. In the case of the poorest readers, the reading components assessment will provide a wealth of information on their strengths and weaknesses, for example in terms of basic vocabulary, basic comprehension and fluency.

In order to read effectively, one requires basic skills such as word recognition, decoding skills, vocabulary knowledge and fluency: these are the building blocks of literacy and the basic reading component skills. Previous literacy surveys have found substantial proportions of the adult population unable to demonstrate adequate levels of skills needed to retrieve and understand written information and apply it to real life situations. However, previous surveys have not been able to distinguish between those who lack basic reading component skills from those who have mastered the mechanics of reading but are not skilled at comprehension.

The PIAAC measures aim to support policy makers in identifying and understanding the extent and dimensions of illiteracy and poor literacy. Having a detailed picture of the spectrum of ability will aid policy makers target and design programmes, not only to eradicate illiteracy but also to improve the skills of adults with some basic literacy. The latter, in particular, is an area which will become increasingly important as a component of a comprehensive strategy to develop the human resources necessary to underpin continued economic growth and development and raise productivity in rural areas.

Finally, since PIAAC assesses foundation skills in a technologically rich environment, it will provide useful information on the mastery of Information and Communication Technology (ICT) skills which are of increasing importance for 21st century economies. Even in the rural areas access to ICT and skills enabling people to use it are essential as explained above (chapter 2). PIAAC will enable a detailed examination of who has access to ICTs and the extent to which different groups of adults use computers and the internet both at home and at work. Most important, for the first time, PIAAC will directly assess adults’ abilities to solve problems in the context of technology rich environments.

Understanding skills acquisition, maintenance and use

PIAAC contributes to our knowledge about the factors that facilitate the acquisition and maintenance of foundation skills recognising that skills can be gained both inside and outside the formal education system and decline again over time.

PIAAC will enhance the understanding of the effectiveness of education and training systems in developing basic cognitive skills and key generic work skills. In particular, it will be possible to examine the extent to which the formal education system has been effective in developing broad
based cognitive skills. PIAAC will also allow exploring the sources of skills acquisition and maintenance beyond formal education which is relevant in particular in developing countries and rural areas where much of the skills acquisition happens informally.

For older cohorts, PIAAC will allow the examination and analysis of the processes of skills loss and maintenance and the effectiveness of education and skill formation systems in supporting skills development over the lifecycle. Findings from previous data on adult skills have helped to reveal a consistently negative relationship between foundation skills and age. However, data also shows that the depreciation of skills may be offset by what people do at work and in their daily lives. For example, evidence from previous data on adult skills suggests that frequent engagement in reading at work and at home may help to mitigate the proficiency declines associated with ageing.

Other sources of skills supply: migration and labour force participation

Skills development comprises more than just the education and training system. To get a comprehensive picture of the supply of skills available in a rural area it is necessary to consider also data on migration and on participation in the labour market. Investments in skills which take place locally are not necessarily available to the local (rural) labour market later because individuals migrate. In many developing countries, people migrate to urban centres to continue their education and training or to find a job. Or they leave the country altogether to seek opportunities abroad. Therefore, a measure of migration between localities and international migration can provide valuable information on the skills supply. Similarly, skilled workers might become inactive for various reasons so that their skills are not available to the labour market at all, neither locally or elsewhere. A measure of the share of inactivity in the local rural population complements the information on skills supply.

IV. Skills Demand

Increased access to good quality education and training does not automatically lead to better economic outcomes. Skills development above all has to be relevant to the current and future needs of the economy in order to trigger the desired outcome of rural transformation. The primary aim of skills development in rural areas is not to equip people with the skills they need to move to urban areas to find a job there or to continue with further studies at higher education institutions – or even to migrate from developing countries to advanced economies. If the aim is much rather a transformation of the rural areas and avoiding rural exodus, then the supply of skills through education and training has to be structured according to the local demand. In countries such as China, migration between rural and urban areas is a big issue but one which can be mitigated by equipping people with the skills necessary to transform the rural sector and move from subsistence farming to agro-business.

Moreover, the relevance of education provision can have a direct impact on skills supply. The reason why participation in education and training in rural areas is weak in the first place might have to do with the (perceived) lack of relevance of the education provision for the rural population. Lack of relevance of educational programmes and curricula can range from a focus on occupations which are not in demand in rural areas to the language of instruction which is not the one spoken by the local population. In order for education and training provision to be relevant, and hence to be taken up, it is important to assess the specific demand for skills in rural areas and the kinds of skills necessary to foster rural transformation.

In order to make skills supply relevant for the economy, information needs to be acquired about the demand for skills in the first place. Two key measures indicators might be used to assess the demand of skills in rural areas: employment shares by education background and by occupation. Typically, census, labour force and other household surveys provide this kind of information. In addition, it might be considered to measure the importance of self-employment, as this form of employment is very common in many developing countries and requires its own set of skills, particularly entrepreneurial skills.

One important challenge for measuring the demand for skills in developing and emerging economies arises from the fact that big shares of the economy are in the informal sector. Hence, the demand for skills is equally informal and,
due to its very nature, difficult to measure or to include in official statistics. This should be taken into consideration when estimating the relative demand for different skills and developing skills policies based on these estimates.

Responding to radical changes in skills demand

Skills demand might change radically if an economy undergoes a sudden transformation. In particular some emerging economies are currently experiencing fast and radical growth and related changes in their demand for skills: new sectors emerge requiring new skills, while traditional sectors, especially the agriculture sector, are disappearing making some previously needed skills obsolete. This can lead to problems of skills shortages which if they are genuine and persist can put a brake on economic growth, primarily through their negative effect on labour productivity. Therefore it is important to monitor the changing demand for skills and to feed this information into the education and training system so that the supply of skills can be adapted to the changing demand.

V. Matching of Skills Demand and Supply and Outcomes

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An important issue in all countries is to ensure that on the one hand the education and training system produces skills that are relevant for the labour market and on the other hand that there is effective matching of workers and jobs to ensure that the skills that exist are productively used. In principle, a good match of the skills required in the labour market and skills supplied supports productivity. Higher productivity in turn leads to better outcomes and returns to education both for the individual and the economy as a whole. Rural areas however might be stuck in a low-skills equilibrium where demand and supply of skills do match but at a very low level, preventing further development. In such a situation, only an over-supply of skills can trigger a change in the economy towards a higher value-added production and an adaption of the demand for skills to the higher level skills available locally. Moreover, even if the demand for skills in the economy does not follow the supply leading to a higher skills equilibrium, equipping people with foundation skills is desirable as it allows them to improve the quality of their present and future lives.

Measures are therefore also required to assess the match of skills that have been obtained through education and training with those required by employers including those in self-employment. Indicators of over- and under-qualification from census, labour force and other household surveys can be used as one way to measure this, although a more direct measure of skills rather than qualification levels can add complementary value.

Two other, more indirect, measures of the matching process might be considered. These are changes in unemployment rates and earnings differentials by educational attainment. All else equal, a rise in the returns to higher education or a drop in the unemployment rate associated with this level would suggest that the demand for workers with these qualifications is outstripping supply. Ideally, it would be useful to supplement these measures with information based on employer surveys of skill gaps and shortages.

A number of measures of economic performance and labour market and health outcomes may provide information on the links between skills and these outcomes. In terms of economic performance, measures could focus on production growth and the level and growth of labour productivity at the local level. Labour market outcomes are represented by measures of employment rates, unemployment and underemployment rates, and earnings. The measures of health outcomes could cover general health status and HIV prevalence.

As with all other measures, to be meaningful for the purpose of assessing the role of skills development for rural transformation, it is essential that these statistics are gathered at a local level which might be a challenge even for more advanced countries where the local statistical infrastructure is not available and information is accessible only in form of a national average hiding a lot of local variation.

Foundation skills and economic outcomes

Traditionally, indirect quantitative measures of skills such as years of education or qualifications attained have mostly
served as proxies to assess the impact of skills on economic and social outcomes. In the future, direct measures of skills from PIAAC for a broad range of countries will provide policy makers with a better understanding of the role of proficiency in foundation skills in improving the labour market prospects of individuals as well as of its relationship with other outcomes such as participation in training, use of information technology and health.

**VI. Contextual Factors Having an Impact on Skills Development**

A set of contextual indicators is required to capture the main drivers of skill supply and demand as well as the key factors affecting the efficiency of the matching process between them. Many of these factors will also affect the outcomes of skill use. Accordingly, a range of measures can be considered including demographics, early childhood development and health, aggregate economic conditions, technology and work conditions, and education and labour-market institutions and policy settings in rural areas. Moreover, it has to be stressed that skills policies are only part of factors supporting productivity and growth along with other policy measures aiming at rural transformation, technological change and innovation and more efficient markets.

The supply of skills from education and training is influenced by the quality and relevance of the education offered. But there are a range of contextual factors that can also have an impact on skills acquisition in particular in poorer rural areas. These factors include the cost of education and the access in terms of availability of transportation or density of education institutions. Data on the GDP per capita in rural areas as well as the cost of education and the local infrastructure to access education institutions help to understand the reasons for weak skills development. Other impediments to skills development, in particular in rural parts of developing and emerging economies, are health related. Therefore, data on the health status of mothers and children at different ages are required.

Demographic transformations can have a profound impact on the demand and supply of skills. Some economies, in particular many African countries are currently experiencing rapid expansion of their youth populations. While this presents an opportunity for boosting growth rates, ensuring that these young people contribute productively depends to a considerable extent on implementing skill formation and labour market policies which support the expansion of employment.

Conversely, in other countries such as China, the combined effects of people living longer and low fertility rates will lead to growth in the proportion of those aged 65 and over compared to the working population of 15-64 year-olds. As a result, the demand for skills is expanding in the health sector. More broadly, this means that economies cannot afford to waste talent and exclude people from the labour market. Consequently, basic data on demographic development (share of people living in rural areas, fertility and mortality and share of the young population) provide useful information on the current and future availability of human capital in rural areas.

There are also a number of context factors that need to be taken into consideration when it comes to assessing the demand for skills for rural transformation and the contribution of skills to economic development and social well-being. These include the structure of the economy (in particular features of the economy in rural areas), employment in different sectors of the economy and the share of informal employment. Furthermore, developing ICT skills is only useful if there is demand for such skills and access to ICT (internet and mobile phones) is ensured. Likewise, entrepreneurship is unlikely to develop even if entrepreneurship skills are fostered if the conditions are not appropriate to do business. Therefore, indicators on the ease of doing business are helpful to supporting skills development for rural transformation.

**VII. Implementing a Strategic Approach to Skills Policies Based on Sound Evidence**

All these measures of skills need to be analysed and operationalised to support the development of sound skills policies leading to rural transformation. As mentioned at the outset of the chapter, many countries currently do not have the statistical infrastructure necessary to gather and process many of the measures suggested in the framework. One of the essential tasks for the future will therefore be to support countries in efforts to improve the evidence.
base. OECD’s work on skills and the G20 Action Plan to develop skills indicators for least developed countries are important steps towards this goal.

Developing sound measures of skills demand, supply, match and outcomes as well as contextual factors having an impact on skills is only a first step. Data and evidence need to be used and applied strategically to support a structured approach to skills policy-making for rural transformation.

Skills policies are complex and involve a broad range of stakeholders. They concern on the one hand a number of supply side actors (typically the ministries of education, science and technology, but also education providers as well as actors concerned with migration and labour market policies). On the other hand they concern those actors dealing with skills demand, including ministries of labour and industry but also the private sector as well as institutions having as their mission to link the two such as employment offices responsible for reinserting the unemployed in the labour market.

In rural areas health status can have an important impact on whether individuals participate and succeed in education and, conversely, education can have a strong influence on health outcomes of individuals. In these circumstances, it is important to consider actors dealing with issues of welfare and health in conjunction with skills policies.

Given the range of actors involved in skills policies for rural transformation and the linkages between different policy fields, a systematic approach is needed to avoid duplication of effort and take advantage of possibilities for synergies. Similarly, to optimise the efficiency of investments in skills from private and public sources and maximise the returns to such investment, a strategic and coordinated funding approach based on sound principles (Box A2.4) helps to avoid underinvestment on the one hand and deadweight on the other. Finally, the evidence on skills which is often collected and managed by different institutions and not always available to all relevant actors needs to be drawn together and used to support a strategic approach to skills policy-making.

### Box A2.4 Principles for Financing Skills Formation

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<thead>
<tr>
<th>Principle</th>
<th>Details</th>
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<tbody>
<tr>
<td>Principle 1:</td>
<td>Systems to finance skills formation should be efficient, providing the necessary resources to respond to the demand by individuals and employers.</td>
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<tr>
<td>Principle 2:</td>
<td>Skills development should be financed by a mix of sources, reflecting the benefits to individuals, employers and society as a whole.</td>
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<td>Principle 3:</td>
<td>Public spending should be allocated in ways that encourage the responsiveness of educational providers to the preferences of learners and the needs of the economy.</td>
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<td>Principle 4:</td>
<td>Financing incentives, including through taxes, should underpin private investment in education and training, both from individual households and from employers.</td>
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<tr>
<td>Principle 5:</td>
<td>Financial instruments, such as loans, should be available to ensure that up-front costs are not a barrier to accessing skills formation for disadvantaged students.</td>
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<tr>
<td>Principle 6:</td>
<td>Financing mechanisms should be designed with the whole system in mind, so as to avoid distorting student choice, such as that between vocationally-oriented and general education at the post-secondary level.</td>
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<tr>
<td>Principle 7:</td>
<td>Financing systems should be simple and transparent.</td>
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Recognising this, the OECD has embarked on the task to develop a global Skills Strategy, a systematic approach to skills policies aiming to support countries in their effort to formulate sound skills policies on the ground. This strategic approach to skills policies integrates the available evidence on the supply, demand, match and outcomes of skills under a common framework and suggests policy measures on all these areas as well as the financing of skills development and steering of skills systems derived from international best practice.

This blueprint provides guidelines for countries or localities not only regarding which kind of information they would need in order to evaluate their current supply and demand of skills, skills match and outcomes of investment in skills, but also on how to deploy this information to support policies that make the most of each country’s or region’s human capital by nurturing, and using, the skills of its citizens to foster development and promote rural transformation.