Priority SD challenges: how kindergartens can help to face them

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Abstract

The paper addresses issues of implementation of sustainable development (SD) in ECCE and gives examples of ESD implementation in different kindergartens. It is stated that kindergartens may contribute to answering SD Goals (Challenges) that have been identified by the Leadership Council of the SDSN as priority challenges, which are interconnected and each contribute to the dimensions of sustainable development. These ten sustainable development challenges must be addressed at global, regional, national, and local scales. Such approach is exemplified by adaptation of the SD Goal "Improve Agricultural Systems..." to ESD. The article contains analysis of adaptation and implementation of SDG at three levels: functioning of an educational institution, activities of children and family activities. For each level concrete examples and cases are given. It is suggested that SDGs be used as foundation for building strategy of ESD implementation in ECCE. The necessary adaptation of the ideas for early childhood is underlined, as well as consideration for local specifics while solving global problems (such as climate, economic, social peculiarities in a country; learning environment in a kindergarten (school); educational programs etc.).

Introduction

2014 is the final year in the Decade of Education for Sustainable Development announced by UNESCO (The DESD, 2005). The results of DESD will be summarized this year in Japan in November. New prospectives for ESD are to be proposed there. Thus it is important to outline some opportunities for implementation of ESD ideas in education of young children (ECCE) (Didonet, 2008; Kaga, 2008; Siraj-Blatchford, Smith, Pramling Samuelsson, 2010; Ryzhova, 2001). Thanks to OMEP ESD has been declared the priority for education for sustainable development, which has been confirmed at the OMEP Assembly and Conference in Cork (Declaration, 2014).

At present many kindergartens and schools are involved in solving ESD tasks. The solutions they find are quite different due not only to diversity of natural, cultural, political, economical, social factors in each country, but also to resources and opportunities of a specific educational institution.

In our opinion, it's possible to create a coherent system of implementation of ESD ideas and help children, parents and pedagogues develop sustainable lifestyle. Such system can be founded on a

document on sustainable development or on ESD that can serve as basis for classification of different activities in kindergartens or schools. The document that is examined in the article in this regard is «An Action Agenda for Sustainable Development», - report for the UN Secretary-General, prepared by Leadership Council of the Sustainable Development Solution Network (Agenda, 2013). This document includes many ideas that can be viewed from the ECCE angle. These ideas are analyzed as linked to the Millennium Development Goals. The authors of the report made an analysis of contemporary trends in ESD and outlined nine most important Sustainable Development Goals (challenges):

Goal 1 - End Extreme Poverty including Hunger;

Goal 2 – Achieve Development within Planetary Boundaries;

Goal 3 – Ensure Effective Learning for all Children and Youth for Life and Livelihood;

Goal 4 – Achieve Gender Equality, Social Inclusion and Human Rights;

Goal 5 – Achieve Health and Wellbeing at All Ages;

Goal 6 – Improve Agriculture Systems and Raise Rural Prosperity;

Goal 7 – Empower Inclusive, Productive, and Resilient Cities;

Goal 8 – Curb Human-Induced Climate Change and Ensure Clean Energy for All;

Goal 10 – Secure Ecosystem Services and Biodiversity, and Ensure Good Management of Water and Other Natural resources.

All the goals are connected to each other and reflect 4 dimensions of sustainable development: environmental, economic, social and governance.

What in this document is so important with regard to ECCE? It is, of course, in the first place addressed to governments and businesses. However it underlines vital importance of education (starting from early age) for facing the challenges. It also states that achievement of the goals listed above is impossible without civil society actors, including universities and research institutions. We think that this definition may apply not only to research institutions and universities, but also to kindergartens, child-care centers and schools. First of all, they shape new citizens and their set of values, based on the ideas of sustainable development. Moreover, these institutions have close ties with families (in a broad sense, including older generations), community and society as a whole. That means that kindergartens and similar institutions can involve many people, professionally not connected with ESD, into the problem-solving process.

The authors of the “Agenda” emphasize that there are no priorities among the Goals, they are all equal and linked to each other. However not all of the mentioned challenges are equally applicable for implementation in kindergarten or in primary school. Moreover, some challenges can become more urgent in different countries. Still, the most important thing is that any educational institution is able to make its contribution at its own level. The document characterizes each SDG in a certain way. So pedagogues are able to choose those aspects that are best for implementation in their environment, at their particular institution and suitable for their age group (children of older age can take part in the discussion). At the same time it's important

to build a strategy for achieving SDG targets in ECCE, taking into account children's interests and abilities and to organize worldwide exchange of ideas and information.

Methods

As the analysis of “An Agenda for Sustainable Development” (2013) was conducted, we took into account opportunities for participation of younger children in achieving SDG targets. The following indicators were set as criteria: suitability of a target for psychology of early age groups, its possible integration into existing educational programs, potential of schools and preschool institutions, present cases of implementation of similar ideas in ECCE in different countries (the criteria are to be broadened and elaborated in the future).

We outlined three levels of how educational institutions can take part in achievement of SDG targets:

1) activity of the institution proper;
2) activities of children in kindergarten (school);
3) family activities.

As an example of implementation of the above stated theses, the article takes one of SDG for close examination: “Improve Agriculture Systems and Raise Rural Prosperity”. This challenge is connected with such issues as food production, agricultural stress on environment, food consumption, sustainable agriculture, climate change, loss of biodiversity and some others (Agenda, 2013). This target has been chosen because some intermediate tasks that it requires can be adapted for early age and attract interest of children. Besides, at present many preschool institutions in many countries grow crop plants and create vegetable gardens on territory of kindergartens and schools. The vegetable gardens can serve as an example of sustainable agriculture that can be easily explained to children of early age in their language. It must also be noted that this particular SDG helps to see how all SDG's are linked to each other, same as economic, environmental and social SD dimensions.

How schools and kindergartens can contribute to the solution of the problem (activity at the institution level)

1. Create conditions for growing plants in kindergarten (at school). At the moment different approaches exist in various countries. For instance, some preschool institutions have playgrounds covered with artificial materials, while some, on the contrary, use natural soil so that they can grow trees, bushes and grass. Often these patches of land are used for growing and observing plants. These vegetable gardens may occupy relatively large areas with vegetables and herbs

growing there. Presently such vegetable gardens can be found, for instance, in Russia, Poland, Croatia, Ukraine, the Czech Republic, Slovakia and in some other countries.

Another option, often encountered in European kindergartens, are mini-kitchen gardens on the territory of a kindergarten. Actually they are containers where some cultivated plants are growing. In countries with moderate climate and four clearly marked seasons children sow vegetable seeds (tomatoes, peppers etc.) in spring, and later plant them in open ground. Another option in countries with colder climate is using greenhouses.

Vegetable gardens help children to observe plants growing, to learn what's necessary for a plant to live, to see the ties that plants have with their environment. Children can acquire some skills and patterns of sustainable lifestyle when sowing the seeds and taking care of the plants.

2. Pedagogues can invite different people into the kindergarten (school):

a) parents, grandparents and other representatives of older generation who can tell children about their own personal experience in growing plants: how they planted them, what fertilizers they used, etc. This approach strengthens the link between generations and helps children to create a picture of the past. In particular this approach was used within the framework of the OMEP ESD Project Part 3 (Intergenerational Dialogues, (2012).

b) farmers and scientific experts in agriculture, ecologists and other professionals who could speak to children about agriculture and problems in the industry.

3. Pedagogues and children can organize a guided tour to a farm and/or to greenhouses. It's important to plan the program in advance, so that children will receive more information about sustainable agriculture.

4. Pedagogues and children can revise their attitude towards nutrition in kindergarten or at school. At present the process is organized in diverse ways in different countries: a) children bring food from home, b) food is cooked in the kindergarten, c) kindergarten obtains ready-made food and microwaves it, and so on. Food is distributed among children in different ways too: a) children receive standard ready-made portions (often too big for them; sometimes adults don't take into consideration their food preferences), b) children fill their plates themselves and get an addition if they want to. The second way agrees better with sustainable lifestyle. In any case kindergartens are able to arrange children's nutrition so as to ensure optimal consumption of food and minimize organic waste.

5. Pedagogues together with children can study the sources from which food comes into their kindergarten, in what conditions are animals kept (Engdahl, Arlemalm-Hagser, 2008), how fruits and vegetables are grown, to choose those suppliers that are closer to sustainable lifestyle. It's no less important to prefer local food to imported whenever possible.

6. It's necessary to organize separate collection of organic waste that is further composted and used, for instance, in the vegetable garden.

7. Children's activities in this area should be arranged so that they can see links between all ESD dimensions: ecological, economical and social.

What can children learn? (the level of children's activities in kindergarten)

1. First of all it's important that children see plants grow. The same ordinary plants that they find on their plates. It's significant for a child, especially for a city kid, to plant a seed, to take care of the future plant, and finally see it bloom and bear fruit. This way the child learns how hard it is to grow a fruit, how much effort must be put into it.
2. As children are future consumers, it's fundamental to teach them sparing attitude towards food. For instance, they learn to put on one's plate only so much food as one is able to eat, etc. Let's examine a specific case. Projects about bread are popular in many countries. As a rule, in the course of the project children can learn how grain is grown, how it's ground into flour, how bread is baked. In what ways can this project be extended to deal with ESD challenges?
We could draw children's attention to the fact that grains grow in fields. What was there in place of a field? (forests, meadows). So in order to grow grain people cut down trees and plow up meadows. The less forests (meadows), the less forest (pratal) plants and animals – in other words, less biodiversity. Why are there so many "undesirable" insects in the fields, which people struggle to exterminate? Because usually people grow some crops of single species (monoculture), which are vulnerable to pests. A meadow contains plants of different species and, correspondingly, lots of insect species. Agricultural machines work in the fields, they use gasoline that pollutes the environment. When machines grow old, they become waste and are thrown away or recycled.
3. In order to grow big harvest people spend money and resources to make fertilizers, which penetrate into the environment. Many plants need watering, so people have to spend a lot of water on them, using water pumps (that in their turn need energy).
The main idea of these discussions is to make children understand that production of agricultural plants is a complex process that has an impact on environment, to incite changes in their attitude towards everyday food. Thus in one of the Russian kindergartens pedagogues noticed that children often leave pieces of bread on the plates. So they launched the project "Where bread comes from", and as a result children started to take less bread during lunch and tried to leave nothing on their plates.
4. Cultivated plants from all over the world grow in vegetable gardens. Children can mark on the map the place of origin of the plants growing on the kindergarten territory and find out what their ancestors in wild nature were. This approach not only develops children's global thinking and introduces them to basic geography, but also helps them understand why biodiversity is so important.
5. When children grow plants they learn about mutual connections between organisms, about their links to environment and ecological features. It's important that children understand the meanings of their actions, for example, why they have to loosen soil in the vegetable garden. An

experiment can help to understand this: let's compare two lumps of earth – one taken from the vegetable garden after the soil has been loosened, the other taken from a patch that has been trampled down by many feet. Both lumps are then immersed in water and children observe what's happening (the lump of loosened soil emits a lot of bubbles, while the other lump makes much less). This way children learn that soil contains air, required by plants, and come to understand what's the meaning of loosening soil.

6. When watering plants children can realize the significance of water in life of plants and animals. To make them think of sustainable aspects we may suggest that they should state their hypotheses: where does the water come from and where does it go after they have watered the plants? As a rule after having a discussion like this children begin to understand that water is a valuable resource that should be spared. They also give their opinions on how it can be done. For example, in the rain we could collect water into a container and later give it to the plants.

Together with children you may learn what power sources are used to supply the kindergarten with water, whether there are alternative energy sources among them (the energy of the Sun, the wind, etc.). For example, if the power source for your kindergarten is a heat station, then sparing use of water for the plants will reduce emission of greenhouse gases into the atmosphere.

7. Besides, it's necessary to learn about ecological preferences of different plants: for instance, some of them require more water, some need to be watered rarely and scarcely, while water needs to go directly down the stem.

8. A vegetable garden provides themes for discussion of environmental safety. For example, which places are fit for a vegetable garden and which are not and why. Sites close to highways with heavy traffic and in other environmentally hazardous areas in cities are totally unsuitable for growing food. In these conditions plants accumulate substances harmful to our health.

9. Growing different kinds of plants can also contribute to multi-cultural education (social dimension). Together with their parents children can find information about how vegetables are cooked in different countries and make the dishes themselves. If the kindergarten has children from different nations they can present their national dishes, made of the self-grown fruits and vegetables.

There is another multi-cultural aspect: which fruits and vegetables can be found in fairy-tales and folk riddles in different cultural traditions? When implementing projects about bread children can learn about kinds of bread typical for different nations and try to make them in the kindergarten.

10. A vegetable garden is a perfect place for studying natural cycles and understanding ecologically safe agriculture. Children can gather food leftovers, dead leaves and fruits and turn them into compost to make organic fertilizers for the vegetable garden. To help children understand cycling of substances in nature you can bury fallen leaves, remains of leaves and roots from the vegetable garden, mark the place and dig it up after some time. You can examine the site and discuss with children what happened to the organic remains. You can also compare

green leaves to dead ones. How are they similar and how are they different? Where did the dead leaves go? And how?

11. Another interesting activity is studying animals that live in soil in the vegetable garden. Children can study the specimens of soil with magnifying glasses, trying to find as many of underground dwellers as possible, sharing their discoveries. For example, why are there so many earthworms in the vegetable garden?

12. It's also very interesting to study insects that visit the flowers in the vegetable garden, discuss their reasons for landing on flowers and their role in pollination of plants. These observations help children to understand close relationships between plants and insects and to realize the importance of biodiversity (in this case in the animal kingdom) and benefits of organic agriculture (artificial chemicals lead to reduction in number of insects and other animals).

13. It's important for children of early age to realize that not all plants can be grown in their area (geographical and ecological aspects). Some plants require warm and humid climate, while others can grow in cold dry places of the Earth.

14. A vegetable garden in a kindergarten or at school can contribute to health care: children spend more time in the open air, they learn about significance of vegetables in everyday ration and about organic farming, etc.

What can parents learn? (Family level)

Family involvement in achievement of SDG targets was partially discussed above, so this section contains some additional information.

Early age is the period when parents are actively involved in bringing up their child and have active contact with pedagogues. Not only parents influence the child, but the reverse is also true: children's activities can change outlooks and attitude of parents. Often kindergarten project help their adult participants to look at things from a new angle. In one of Russian kindergartens parents and grandparents together with children created a garden that would allow growing plants in a natural way (the plants were chosen according to local climate taking biodiversity into account; elements of organic agriculture were applied; the participants created compost heaps, rationed water for plants etc.). As a result many of the adults revised their opinions on agriculture and started applying principles of sustainable agriculture in their home vegetable gardens.

Another example of how older generation took part in working towards SDG targets is OMEP ESD Project Part 3, Goal 2 (Intergenerational dialogues, 2013). In the course of the project children asked their grandparents whether they used to grow plants in their vegetable gardens, what is needed for successful gardening, etc. Traditionally many people in Russia have their own vegetable gardens, so grandparents and other adults were happy to share their knowledge and experience with young kids. Residents of the community around the kindergarten brought

seedlings and offered their recipes of vegetable dishes. This kind of cooperation ensures equality and partnership in relationships between children and adults and promotes passing down knowledge across generations.

Another example of influence that kindergarten projects can have on parents is the project dedicated to waste in one of the Moscow kindergartens. Children made compost heaps to fertilize soil in the vegetable garden and on the flower bed, thus they found out why there is no waste in nature, where dead leaves and branches go, etc. Then children learned about signs of environmental safety on products (including the “recyclable” sign). After some time parents started telling teachers at the kindergarten that when the family goes shopping their children look for environmentally safe products and insist on buying only products of this kind. Many mothers and fathers confessed that they haven't payed much attention to these signs before, but they changed their attitude thanks to children. This way children together with parents (families) become civil society actors and implement some of SDGs in their everyday lives.

Results

The analysis shows that a number of SDG targets can be adapted for children of early age and implemented in preschool institutions at three levels:

- at the level of functioning of the institution (in organizing work with children; creating learning environment; educational programs; choice of equipment; children's nutrition; use of alternative power sources, etc.);
- at the level of children's activities;
- at the family level.

Participation in implementation of SDG targets helps children and parents develop a new set of values. They start to realize that sustainable development on the planet also depends on their everyday demands, habits and conscious actions. And they learn about sustainable development and put its principles into practice.

Since sustainable development is initially an integrated concept, children's involvement in these activities contributes to their comprehensive development and to their understanding of links between economical, social and environmental problems. Children learn in action: they put forth hypotheses, test them in practice, independently search for information, communicate with people of different generations, while adults provide support for their initiative. The example described above (setting up a vegetable garden in kindergarten) shows that activities of children and adults in implementing SDG targets can vary widely in forms and content.

As SDGs encompass all domains of sustainable development, they can become the foundation for the strategy of implementation of ESD ideas in ECCE (or at least they can be taken into account as the strategy is developed). That will help create a coherent educational system and

embed SD ideas at the global level with reference to local specifics – that is, implement one of the basic principles of sustainable development: think globally – act locally!

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