Abstract—This research focuses on the agriculture sustainable development for poverty reduction and raising productivity in agriculture. Agriculture is one of the vast majority of Bone District, South Sulawesi Province, Indonesia that makes their living with its high multiplier affect across the wider economy. This sector also is most capable of growing the continent’s economy in the medium term. KKN PPM Dikti gives fund to manage research in all areas including agriculture and renewable natural resources where conducted in Bone District. This research aims to priorities technologies. Next aim is to maximize the returns in areas of high agricultural potential. Third aim is to maintain people's exposure to risk and vulnerability of resilience to short-term shocks such as drought, pests and diseases. The last aim is incorporate research on market opportunities. This program conducted in Biru and Cenrana Villages, Bone District, South Sulawesi Province, Indonesia. Both villages need knowledge and technology to produce global public goods. Innovation in this district can invite many investors to invest their money. There are collaboration between lecturers, student and local people to recycle products namely compost. The process of composting will be of benefit to local farmers concerned such as for the social and economic aspects. The benefit for the social aspect of composting is an increase of education about composting to people, local farmers, and business. The economic benefit is the sale of complete compost by local farmers.

Keywords— Agriculture, Bone District, Economic Benefit, Social Benefit, Sustainable Development

Introduction

The agriculture sustainable development focuses on enhancement the quality of life for farmers and society as a whole through international cooperation. This sustainable agriculture drives innovation and economic growth in Bone District, South Sulawesi Province, Indonesia. Economic growth of people based on public and private investments. As a result the agricultural knowledge and technology in this district is getting better and better. International cooperation in agricultural and natural resources is aimed at producing global public goods which investors can invest their money to increase life of people. Innovation in this district based on sound science and technology. Indonesia as a developing country farmers need the innovation to in response to key drivers of change such as the changing nature of agricultural markets, climate change, new weather patterns and new pests and diseases of crops and animals.

This research conducted in collaboration with lecturers from Hasanuddin University who get fund from Indonesian government and students from Hasanuddin University who took subject known as KKN (Kuliah Kerja Nyata or Community Service Program) in a village during three months. Lecturers got fund under KKN PPM Dikti project to improve people’s life through technology application. This program involves a wide variety of educated planners, unbiased mediators, and local community members. KKN PPM Dikti is one of a major donor and though leader on agricultural and research for development, growth and poverty reduction. There were 21 students from various faculty such as agriculture, farms, science and social science faculties. Lecturers and students get opportunities to keep under review for new products and value addition along the market chain.

Research Problem

The allocation of South Sulawesi’s GDP is characterized by the domination of household consumption (konsumsi rumah tangga) and government consumption (konsumsi pemerintah). According to Tenriawaru and Arsyad that South Sulawesi’s GDP growth is still weak from both sector namely the business and entrepreneurship sectors in creating technological innovation, efficiency and effectiveness (Tenriawaru and Arsyad, 2013:223). Based on description above, this area needs partners for better coordination and harmonization of support agricultural and renewable natural resources research. Agriculture sustainable development is a crucial element to avoid the potential depletion in the future and require redevelopment.

Aim of Research

This research aims to priorities technologies that will increase the productivity of labour, create agricultural related employment, trade and commerce – all of which are vital to
achieving agricultural growth, reducing rural poverty, increasing investment and multiplying growth across other economic sectors. Next aim is to maximize the returns in areas of high agricultural potential such as in Bone districts. Third aim is to maintain people’s exposure to risk and vulnerability of resilience to short-term shocks such as drought, pests and diseases, and longer term trends such as climate change where agriculture, fisheries and forestry can contribute significantly to adaptation measures. The last aim is incorporate research on market opportunities. Investment, innovation and improvement of productivity can grow and secure markets of people in this village. This village focuses on basic food staples and domestic markets.

Method of Research

South Sulawesi Province is located in the central part of Indonesian Islands. The capital city of the province is Makassar which is stretched out between zero and 12°-8° South Latitude, and 116°48’ up to 122°36’ East Longitude. The province is bounded by the West Sulawesi Province and Bone Gulf in the north and Southeast Sulawesi Province in the east. Bone is one of district of South Sulawesi.

The Strategy for research on sustainable agriculture conducted three months in 2015 in Bone District, South Sulawesi Province, Indonesia. This sets out KKN PPM Dikti-Unhas’s approach to research on agriculture to get new technologies to poor farmers and to help governments to make better policies.

Results and Discussion

This program uses sustainable development especially in agriculture to promo the health, environment and local economy as well in village, namely 1) Recycling products such as compost. Recycling is a way to manage waste as it relieves negative pressures on the environment. The critical important of recycling products is reduction the amount of greenhouse gas emissions that enter the air through the production of new products (EPA, 2010).

Figure 1. The Condition of Bone District

Organic matter that has been decomposed and recycled as a fertilizer and soil amendment is compost. In organic farming, compost is an important ingredient. A series of process are making a heap of wetted organic matter known as green waste (leaves, food waste) and waiting for the materials to break down into humus after a period of weeks or months. The other process is a multi-step, closely monitored process with measured inputs of water, air, and carbon- and nitrogen-rich materials. This process, we call methodical composting. The other level is the decomposition process. This process focuses on shredding the plant matter, adding water and ensuring proper aeration by regularly turning the mixture. Worms and fungi further break up the material. Bacteria requiring oxygen to function (aerobic bacteria) and fungi manage the chemical process by converting the inputs into heat, carbon dioxide and ammonium. The ammonium (NH4) is the form of nitrogen used by plants. When available ammonium is not used by plants it is further converted by bacteria into nitrates (NO3) through the process of nitrification.

Figure 2. Process of Composting

Source: Student KKN PPM Dikti-Unhas conducted the process of composting in Village Biru, Bone District, South Sulawesi Province, Indonesia.

Many nutrients contained in compost. These nutrients can be used in gardens, landscaping, horticulture, and agriculture. People in Biru and Cenrana Villages use it for a
soil conditioner, a fertilizer, addition of vital humus or humid acids, and as a natural pesticide for soil. Other beneficial is useful for erosion control, land and stream reclamation, wetland construction, and as landfill cover (see compost uses). Organic ingredients intended for composting can alternatively be used to generate biogas through anaerobic digestion.

Figure 2. Process of Composting

Source: Student KKN PPM Dikti-Unhas conducted the process of composting in Village Biru, Bone District, South Sulawesi Province, Indonesia

The benefit for the social aspect of composting is an increase of education about composting to people, local farmers, and business. They know about the composting processes. Moreover, they also give education to young children and commercial institutions about composting. They established a center to dedicate to local and organic farming and gardening. Moreau said that residents and businesses take the benefits of composting through their solid waste in order to consciously remove organic wastes (Moreau, 2011).

The economic benefit is the sale of complete compost by local farmers. There is one organization that manages the solid waste. The tip fee will be charged to each private hauler who disposes of organic wastes. Therefore, This way can ensure the life and stability of the organic materials processing facility. The other benefits are for the local people where the composting facility is located. There are 10 to 25 local farmers who join in this program. That is mean, more than $1 million in annual payroll for local people. This activity describes a good business because there is profit sharing for the local farmers who work together in making the process of composting efficiently.

This program can be a local source because premium finished compost is a cheap way to cuts trucking cost for people who using the material locally. That is mean, the local residents can save money. The tax burden of the people becomes lower. The other economic benefit is soil become health. That is mean, people can get plant health too because there are quality, mature and compost.

Conclusion

KKN PPM Dikti Project supports agricultural research by ensuring provides for a balance between basic science, translational and adaptive research, and programmes to get research into use. This research based on collaboration between lecturers as researcher and students and people of village. They work to strengthen research in several main research areas in agriculture and renewable natural resources over the next five years: new agricultural technologies that enhance and maintain productivity levels; high value agriculture in areas of medium to high agricultural potential; rural economies; risk, vulnerability and adaptation; markets; and managing the resource base sustainably.

References


Tenriawaru, A Nixia and Muhammad Arsyad. 2013. A Public Expenditure Analysis in Agriculture Sector: Evidence from South Sulawesi, Indonesia. Paper. Indonesia: Department of Socio-economics of Agriculture, Faculty of Agriculture, Hasanuddin University, Makassar, South Sulawesi.